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## THE NATURE OF CONCUSSION\*

BY

GEOFFREY JEFFERSON, M.S., F.R.C.S.

*Professor of Neurosurgery, University of Manchester; Hon. Neurological Surgeon, Manchester Royal Infirmary and Salford Royal Hospital*

The approach to the interpretation of concussion through its history presents a kaleidoscopic panorama in which succeeding generations are seen attempting to solve the same problem in the light of the scientific knowledge available to them: the same patterns of thing recur in a new setting. The first solutions were vibratory and oscillatory, and were suggested by contemporary new work in physics; they were what we should now call neurogenic, although the neurological knowledge on which any satisfactory conclusion could be reached was still to come. We shall do well to remember that each succeeding explanation offered was in accord with the best information in physics then available. However incorrect it may seem to us, it was satisfactory to a large number of contemporaries, and bore the imprimatur of the leaders of thought of the day. Some 50 years ago the oscillatory theories were abandoned in favour of a new vascular hypothesis. It was suggested by the work of Goltz, who had impressively demonstrated that the effects of shock were caused by a paralytic vasodilatation.

In 1870 Hermann Fischer, in a paper that was to become famous, discussed a case of head injury shown at a clinical meeting the day before. He asked, "What is the anatomical basis of the picture?" Various people had made suggestions, usually on gross anatomical evidence. Thus Rokitsansky (1856) had been satisfied that capillary apoplexy at the site of the injury, and maybe elsewhere, explained all the signs; and Nélaton (1847) had held a similar belief. Actually punctate haemorrhages were first described by Richard Bright (1831), who stated specifically that he did not think that they would account for the symptoms of concussion or coma. Fischer's own explanation was of a physiological kind, because in two cases that he had observed he found nothing but cerebral anaemia with congestion of the surface vessels and the dural sinuses. "You will ask," he said, "what sort of queer disease picture is this that to-day threatens the patient with the severest symptoms, all of which to-morrow will have passed completely away." He suggested, but immediately rejected, reflex vessel spasm as a possible cause of this anaemia, and replaced it with the postulate of long-continued vasoparalysis. Seven years later Ludwig Witkowski, after having first accepted Fischer's theory of vasoparalysis (and it is a remarkable error of medical bibliography that Fischer is usually credited with having postulated vasospasm), finally rejected it in favour of a neurogenic causation, its localization unspecified. Bergmann went through the same phases, while Kocher (1901) in his unnecessarily long and verbose book can be held to support all theories. Vasospasm at no time had reputable supporters,

because the physiologists had proved that there were no vaso-constrictor nerves on the cerebral vascular tree—a belief supported by Leonard Hill, and not shattered until the work of Forbes and Wolff (1928) and of M. Riser (1936) and Villaret *et al.* (1936) provided the needed correction. Ricker (1919), again, postulated a vasoparetic explanation with prestasis and focal softening. In the meantime the theory of mechanical arrest of the circulation by an instantaneous rise of intracranial pressure at the moment of injury, suggested first by Strohmeyer (1864) and brilliantly put forward anew by Trotter in England (1932), won an army of adherents. Trotter stated that cerebral anaemia was the cause of concussion, which he defined as a state of paralysis instantly induced but with a strong natural tendency to rapid and spontaneous recovery and not necessarily associated with gross damage. Longer periods of unconsciousness were attributed to contusion, but as to contusion of what (except of the brain generally, with possible local bruising and burstings) Trotter was silent. This will be recognized as a return to the neurogenic theory, although Trotter always spoke disrespectfully of those who believed in molecular commotion with widespread synaptic breaks—as well he might if the phrase is interpreted literally. In England, C. P. Symonds (1940) and I were critical of the vascular theory.

The apparent paradox arises, from a consideration of the most important contributions of the last two centuries, that in the main, however much the interpretations disagreed, the observations were correct. Although a great deal was added to the data of cerebral injury the anomaly remains that the most striking feature, the unconsciousness, was left unsolved. We shall see that the reason lay in the inability of the investigators to grasp the fact that commotion of the brain may upset its actions for much longer than a moment, the disturbance enduring longer and longer according to the severity of the concussive force. (I shall have more to say of this matter in a moment.) Nor could the majority conceive that anything below a cortical level could interfere with consciousness.

## Experimental Effects of Concussion on the Brain-stem

The effects of injury showing themselves so often by alteration in the pupils, in the frequency and depth of respiration, in the pulse rate, blood pressure, and low-level somatic reflexes (the corneals, the pharyngeal, laryngeal, and swallowing), focused the attention of some workers on the brain-stem and on possible means by which such a low-level injury could come about. Hence sprang Duret's theory of cerebrospinal fluid shock, which provided a theoretically good explanation of the reason why a blow on the vertex should injure the vital bulbar centres; and he, together with Koch and Filchre (1874) and especially Polès of Belgium and Miles of Edinburgh, published convincing experimental evidence that low-level disturbances even as caudal as the spinal cord (in which gross lesions were more often found than many remember) did

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actually occur. Gavin Miller (1927) repeated much of this work, and was able to cause concussion in the heartless frog as had Schiff, Goltz, and Witkowski before him. The problems were restated and retested by Denny-Brown and Ritchie Russell (1941) in a most important experimental series in which the evidences of brain-stem paralysis were proved to be well founded, with the entirely novel discovery that concussion could much more easily be produced if the head were free to move when it was struck. The essential factor was the suddenness of the acceleration imparted to the head and, in different circumstances, of the deceleration. The immediate alteration in respiratory rhythm, in pulse rate, blood pressure, pinna and corneal reflexes found by others, were again observed. A vital fact was that concussion could be produced without deformation of the skull—a rebuttal of the common surgical pictorial representation of indentation of the skull compressing the brain. None the less, the active cause remains a sudden application of energy to the brain. It is important to note that Denny-Brown and Russell had been able to produce concussion in decerebrate animals. These experimenters had nothing new to offer on the cause of the most impressive feature of concussion—unconsciousness itself—since their animals were either anaesthetized or decerebrate. We can safely leave the fundamentals of concussion other than this last as resting on a firm basis of experimental proof linked with clinical observation, and conclude that whatever alterations in cerebral blood supply either accompany or follow a concussive blow are secondary or epiphenomena, and that the prime cause is a paralytic effect on the neurons of which the brain mass is composed, including those of the brain-stem.

#### Unconsciousness or Traumatic Stupor

The question is, What part is played by the cerebral hemispheres, the cortex, and the deeper nuclei in the concussion or contusional syndrome? The majority of writers have assumed that consciousness is mediated by the cortex, and it will be immediately conceded that of full consciousness in the psychologist's sense this is certainly true. What is more, the occurrence of fits, often of focal type, the development of paralysis and of post-traumatic mental disorders, and the discoveries made at necropsy all certified that cortical and sub-cortical lesions of various degree and in various situations could sometimes, but not always, be found at high levels of neural integration and were not to be denied their importance in the total clinical picture. Are these the cause of stupor? The experiments of Tillman (1899) on the sliding movements between grey and white matter because of differences in their specific gravity, the cover-glass experiments of Ferrari in Kocher's laboratory, searches into the histology of the cortex after injury (Jacob, von Holder, 1904), all attest this concentration of inquiry on the cortex. More recently Greenfield (1938) demonstrated the demyelination that often follows severe injury. All these studies, save Greenfield's, ended without conclusions of a convincing kind, because the inquirers failed to realize what seems to be fundamental fact—that injury, that contusion, paralyzes nervous actions without the necessity for the effects of the contusion to be either macroscopically or microscopically visible, as was correctly stated by Trotter in his classical definition. The proof lies in the vigorous scrutiny of the facts of concussion itself and of contusion of the spinal cord and peripheral nerves. Laboratory work on the passage of impulses along axons (Erlanger) and on transmission at the synapse agrees that these are easily disturbed without gross alteration in structure. There is much that we must learn about the living conditions of the neuron, single or in vast communal partnership, after injury; physiological analysis by electrical methods holds out more hope of success than anatomical study. We should become better able through biophysics and micro-chemistry to demonstrate electro-chemical deviations from normal under injury.

Turning to clinical study of concussion or contusional cases, we are presented with material which is almost too rich, coloured as it is by individual differences of the patients' personalities and behavioural possibilities, and we are driven to the conclusion that there is no single fact or any group of facts which will tell us the course of unconsciousness in head injuries without confirmation from other sources. I have long believed that the classical stupor-recovery-stupor sequence

of intracranial bleeding might hold the key to the problem. I know now that it does so.

There can at this date be little doubt that traumatic unconsciousness is produced by a low-level lesion—hypothalamic and brain-stem. Suggestions to that end have been made in the past by Heubel and by Breslauer (1914) in favour of the fourth ventricle, Knauer and Enderlen (1922) for the mid-brain. B. Heubel and Witkowski found that when they opened the skull of a frog and touched the fourth ventricle with the head of a needle the animal, after showing evidence of pain, fell into a completely comatose condition lasting a longer or shorter time; the same result could be got in rabbits. Witkowski had witnessed the accidental injection of novocain through foramen ovale into the posterior fossa in anaesthetizing human trigeminal nerve—an act which produced stupor, experiment he found that the injection of fluid into the posterior fossa of animals also had that effect. Something more than tentative support to the doctrine of consciousness as a low-level affair has been adduced for non-traumatic cases by Penfield (1938) and by J. C. White (1940). In this J. G. Greenfield also suggested it. Not only have animals rendered unconscious by experimental injuries to the end of the fourth ventricle at pontine level but, what is more convincing, injuries inflicted on man on comparable areas, especially in attacks on acoustic neuromas, are usually attended, when fatal, by unconsciousness from the moment of operation. It is in fact one of the most striking of neurosurgical phenomena that unconsciousness can be so readily produced by disasters in the posterior fossa and that ventricular drainage, which reduces the hemispherical pressure to zero, has no effect in restoring consciousness though the dynamics of the cerebral circulation and hemispherical tissue respiration must have been restored to normal. Nor does pressure of brief duration, a generalized cause unconsciousness, as Browder in pain has shown in the human. I can support that observation. That it may do so in time none will deny, but then for special reason that pressure sustained for some hours or days causes a prolapse of the temporal lobe on the compressed (or of both lobes if the compressing agent is medial more distant) into the tentorial hiatus. Here a cone is formed which compresses the diencephalon and rostral end of mid-brain, and unless this can be relieved by the appropriate surgical measures unconsciousness will continue until autolysis or breakdown causes death. This is the explanation of the fact that surgical mortality chiefly occurs in cases with unrelieved pressure cones or when bleeding into the mid-brain has already taken place. There is little doubt that a cone at this level is more frequent and more dangerous (because less relieved) than the better-known one at the level of the falx and the great sylvian fissure.

#### Focal Lesions causing Stupor

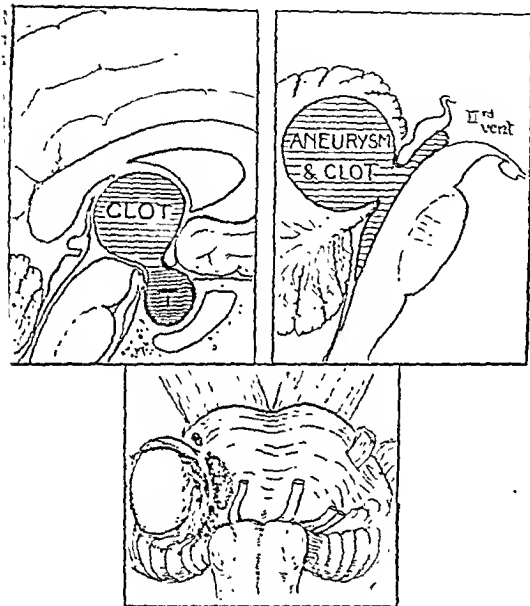
I have said that evidence on the localization of consciousness (and I shall shortly return to a statement of its nature) is produced from other sources. Mention has been made of a fact that a posterior fossa lesion may cause unconsciousness. The notion that the stupor is caused by so severe a lesion back of the c.s.f. in the ventricles that cortical anaemia is destroyed by the observation that the state may persist in intraventricular pressure is reduced to atmospheric. It is that puncture may relieve, but the vital point is that it does not necessarily do so and that the patient may die with nothing above the tentorium, or at least above the hypothalamus, apparently normal.

Clean-cut examples of brain-stem or hypothalamic lesions causing coma are presented by the following cases:

**Case 1.**—A. B., aged 48. Admitted Neurosurgical Service, Chester Royal Infirmary. Referred by Dr. O. M. Duthie to the Royal Eye Hospital Dec. 10, 1942, on account of protrusion of eye for 3½ months. The local signs are not important for the present discussion. A right-sided bone flap was turned down and the skull unroofed, with the discovery of a small resistant mass in the middle of oedematous orbital contents. It was judged to be non-neoplastic and the operation was concluded as an orbital decompression Naffziger type. The patient's pulse was rapid throughout the operation. She did not recover consciousness, and died 48 hours later in hyperthermia. Her pulse rate ranged between 174 and 180 respirations in the 40s and 50s and a temperature that varied between 99.6° and 104° on the first day and between 102° and 105°

Second. Occasionally she looked as if she might be about to wake up and half opened her eyes, giving the impression that she might be arousable and might speak if she could be sufficiently interested. All efforts to make contact failed and stupor returned.

The problem is, Why had this patient died? I suggested that a mid-brain or periventricular haemorrhage caused by anoxia in a long nitrous oxide anaesthesia might be the cause. However, at necropsy it was found (1) that the nodule in the orbit was a thrombosed aneurysm of the ophthalmic artery; (2) that there was no extradural clot; (3) that externally the brain was completely normal; (4) that she had died from the local compressive effects of the rupture of a second aneurysm in the cerebellar vermis with blood-clot plugging the iter (see Fig.).



stupor. These cases demonstrate the prime importance to consciousness of intact integrative pathways in a vertical direction, and demonstrate also that anatomically undamaged connexions in and between the hemispheres themselves are not sufficient to maintain consciousness. This is in some ways a surprising conclusion, but there is no doubt of its truth. Other examples might easily be adduced, but for the moment these will suffice while we turn to the essential point—the nature of this stupor, this state that we call unconsciousness.

### ✓ The Nature of Unconsciousness

The description of diseased or abnormal states by delineating them as the reverse of a defined normal is not one which has commended itself to medical science. This holds true of definitions of consciousness and unconsciousness. We might accept the statement that consciousness is a state in which man (or animals for that matter) respond to environment in a manner which shows insight (cf. Penfield and Erickson, 1941). It is true to say that unconsciousness and the stages of recovery from it, even when they are long-drawn-out, can be comprehended by the reverse of the foregoing—that the patient does not to this or that degree show insight into the problems which his environment sets from day by day or hour by hour; but the statement lacks the necessary crispness. It would be more helpful to define unconsciousness, whether traumatic or otherwise, by a new term which designated more pointedly its nature, its pathological status in terms of neurophysiology. When we watch a patient recovering from concussion we see him sleeping most of the day and night, disturbed at first by only the most intense stimuli, aroused not by thirst or hunger but principally by the pain of bladder distension, made restless by it and sometimes also by pains in the head or elsewhere which he does not understand, cannot analyse. As he recovers, sleep is less compulsive; insight into his state increases. Conversely, when we watch, as occasionally we must, a patient dropping into coma, the picture is even more clearly derived from sleep. At first susceptible to both internal and external stimuli, interest is lost in food, incontinence develops, until stage by stage the hypersomnic periods merge into complete negativism and an unrousability from which there is no reveille. Step by step alterations in pulse rate, thermal control, and water balance take place which culminate in metabolic disaster, local or general, and death.

### Parasomnia

We approach closer to the facts of clinical observation if we speak of unnatural or, in the case of concussion, of traumatic sleep rather than of unconsciousness. Traumatic stupor is a better term than unconsciousness because it has for most of us a certain sleep connotation. There is an advantage in inventing a new term to overcome these difficulties. Something is needed with a sleep meaning but indicative of a condition different from ordinary sleep. The best that suggests itself to me is "parasomnia," a state in which there is no response to stimuli, verbal or mechanical, except those of a reflex nature. In other words, there is no response showing insight into or analysis of the problem set by the stimulus—at least no more than there is in a sleeping person. Variations in the picture can be regarded as the arrest of a moment of awakening and the giving to it of duration. This makes it a completely abnormal condition, and although we may for convenience regard it as an instantaneous freezing of a normal state, this must not blind us to the fact that it is pathological and associated with other abnormalities which further testify to that fact. Whatever words we use we should in future think in terms of sleep and wakefulness. The toekings, nose and body rubbings, mutterings, and unruliness occurring with some head injuries show that cortical actions continue, and compare with those observed by Kleitman (1939) in his studies of sleeping beings. And there is no doubt a high-level disturbance or inhibition of the cortex, partial or complete. But cortical lesions pure and simple do not seem to produce it, nor do massive excisions of the cerebral lobes, as I can well testify. No completely satisfactory human decortication is ever brought about by disease, and certainly never by surgery. We lack that piece of evidence. Yet a small central and basal injury certainly does so. This brings us, if the interpretation

This is a convincing example of the unconsciousness caused by a lesion at infra- and per-tentorial level; the fact that it caused death is less remarkable than its effect on total behaviour.

Case 2.—A woman aged 32 was referred by my medical colleague Dr. A. H. Holmes as a case of pituitary adenoma. What was unusual was the severity of her pain and the fact that she was brown and ill. Operation was performed and an unusually vascular chromophil adenoma cleared out easily. The patient failed to regain consciousness and died, much as did the previous case, in hyperthermia. Necropsy disclosed no contusion of the brain and an average small amount of subarachnoid blood in the basal cisterns. On section of the brain the cause of death was found to be a local clot some 3 cm. in diameter in a suprasellar situation occupying the third ventricle. Once more the essential fact is not that the patient died but that a localized clot in this situation caused stupor.

Case 3.—Mrs. G., aged 31, had the usual signs of a left-sided acoustic neuroma. It was evident from the neurological disturbances that this tumour was of very considerable size. At operation, Jan. 10, 1942, an exceedingly large tumour was subtotally removed, its complete extirpation proving to be impossible. During the manipulations her blood pressure rose to 180, the pulse falling to 50. Five hours after the operation she was moving her arms but could not rouse. She perspired freely and her face was flushed; there was a general vasomotor relaxation. The patient died in this condition 18 hours later with shallow rapid respirations and some evidence of pulmonary oedema. At necropsy the remains of the tumour were found to extend into the hiatus tentorii, and there were discrete haemorrhages in the mid-brain and pons. The cerebral hemispheres were in all respects normal.

In Cases 2 and 3, so far as could be observed, the cerebral hemispheres and the anterior hypothalamus were normal; although all the patients made movements they remained in

which I have given is accepted, head on to the localization of the sleep centres variously placed in the anterior periventricular grey matter of the third ventricle or deeper in the posterior hypothalamus, in the anterior hypothalamus (meaning these areas plus some so far indefinable parts of the basal ganglia), or in the upper pons, or in all (von Economo, 1926, 1930; Fulton and Bailey, 1929; Ranson and Magoun, 1939; Globus, 1940; White, 1940). Nothing could be clearer than the fact that lesions in these areas have an effect on consciousness. Neurosurgery and neuropathology have done much to confirm the truth of observations made in the laboratory. And since lesions in these areas cause stupor and hypersomnia we cannot deny that trauma most probably produces its effects on consciousness in the same areas. It would be ingenuous to believe that there is a nucleus which controls sleep. The obtundation of consciousness must be a highly complex action in which the whole nervous system co-operates. It seems more logical to postulate a "waking centre" (and by "centre" I do not mean a cluster of cells but a circumscribed brain area, injury to or stimulation of which causes certain constant results), damage to which would result in hypersomnia, ending in that mixture of sleep and illness which I have just called parasomnia. Although the area of these waking centres is roughly known we cannot always demonstrate injuries in them. As Symonds pointed out, it is no more "required" to show histological changes than it is in post-epileptic stupor and in Todd's post-epileptic paralysis. Denny-Brown and Russell and their forerunners all showed that animals could be killed without verifiable alterations in nervous structure. But it is a fact that mid-brain, hypothalamic, and pontine lesions can be demonstrated in some persons who die from injury as well as in those who die from tumours. The limits of the region concerned have still to be accurately mapped. Disturbances of the lower closed part of the medulla oblongata seem to be less able to disturb consciousness than those in the upper half of the fourth ventricle, but even that is unsure. The rostral extent is even more difficult to give with precision; it might extend into the palaeocerebrum wide of the third ventricle.

It would be a valuable step if we knew the behaviour not only of a single cell under trauma but of many cells, their rate and regularity of firing, the "boosting" required, the changes that occurred in cell respiration, and enzyme requirements. Further, we shall need to know the effects of trauma on electrical potentials and fibre transmission at different levels of the brain from the cortex to the cord and, if possible, at all levels at the same time. A valuable start was made by Dennis Williams and Denny-Brown (1941) and is being further elaborated by Earl Walker. The e.c.g. pattern is often very similar in sleep to that seen after concussion; there is the same disappearance of fast activity and the same appearance of high-voltage slow waves. As for the circulatory disturbances after head injury, there is a good deal of evidence that these happen in the severer cases. But whether they are occasioned by the stretching of the vessel walls by the agency of the momentary compression of contained blood, or whether they are the result of disturbance of a vasomotor centre or centres arise from altered oxygen and carbon dioxide tensions, we have still to learn. The experiments of White show that there is a slight increase in brain mass after an injury, but oedema of a severe grade seems to be limited to the periphery of areas of actual contusion (Greenfield). We have to regard cerebral pathology after injury as a moving picture altering from day to day. Beyond a certain point there may be a progressive break-up of integration that must eventually be measurable in terms of cell metabolism as well as the transmission of impulses. Some petechial haemorrhages certainly arise secondarily, and are not the immediate effects of the violence. Changes in the vessel walls are visible within a few hours after injury, and these must effect the filtration of plasma elements and finally even of erythrocytes.

If we agree that the major phenomena produced by concussion are not primarily cortical, and are usually recovered from because in the majority of cases the disturbance is a physiological one without gross and persistent underlying alteration in structure, we can more properly understand that the results should so often be good and may be less inclined to accept easily a pessimistic view in prognosis.

### Cortical Activities

The foregoing account has but lightly touched activities of the cortex in concussion, and maybe importance has been unduly minimized. We know of chiefly from psychological study and from e.g. analysis methods which are only in process of correlation. Reference has been made to the effect of a mid-brain lesion in interrupting integrative impulses in caudal and rostral directions and a profound effect that such a block seems to have on what have been regarded as largely intercortical activities. The facts are fully in accord with Kleitman's views on the state of sleep. A similar conception underlies the state of akinetism described by Cairns, Oldfield, Pennybacker, Whitteridge (1941). This again is a negative state affecting both intellectual and emotional tone, and in the one described case on which their paper depends its basis in a third ventricle lesion was well attested. Observations lead me to believe that parasomnia and akinetic mutism are the same thing, but that many patients with cerebral contusion or with tumours can go through this mute state on the way to recovery or, conversely, towards coma. Speed of recovery may prevent its detection or development as a definable condition. For example, in two of the clinical cases recorded above there were moments when the state resembled akinetism alternating with restlessness and mutism and somnia. The difference lies in the sleep propensities (states); it is the dominant factor in the one, not so in the other. Nor does it seem probable that akinetic mutism any more to be separated from general physical disorder is parasomnia. It must be made clear that I do not regard the latter as a purely mental state; it is something more than that. The recognition of these two states, if confirmed by observation by others confirms their validity, would be a step in the unravelling of behavioural peculiarities at a level of psychological functioning than has so far been explored.

The long-lasting mental confusion, the Korsakov syndrome, the patchy or incoherent memory, which persist for months or even weeks after some severe head injuries, can be explained by disturbances of total brain functions which though not certainly, be due purely to cortical blocks. Far they derive from actual anatomical alteration we know. Common sense seems to say that they must have dependence, but a certain amount of agnosticism is allowed. Occasionally the post-traumatic mental state resembles that after bromide intoxication and no doubt from other agents. We do not yet know for how long the interplay of neuronal constellations may be disordered without damage in the sense in which we mean it at present. Perhaps in the future, advances in the technique of recording potentials will reveal abnormalities in the quality, quantity and timing of cell discharges and axonal conduction; a chemical or enzyme background of abnormality indicating the injury, disturbing the co-ordination of those "self-nourishing electrical leaks" (as Sherrington calls them) that underlie cortical activities. Only in some such manner can one postulate a cause for that Jacksonian dissolution of nervous integration that signifies in different ways, at different stages, the effects of concussion. We suspect, though it is not yet proved, that general cerebral contusion causes a disturbance in the blood supply which may conduce to abnormality necessarily originating it.

### Trauma as a Disease Process

In conclusion, no statement on concussion would be without mention of a matter which has so far attracted little comment—the cause of death in those who survive immediate injury. Necropsy material is insufficiently reported because we are dealing with a functional disorder. Explanation has run into wrong channels through the discovery of abnormalities of action must always be accompanied by gross change (and in that term I include microscopic discovery of cortical injury (though much less than the can inflict with impunity), the finding of subarachnoid haemorrhage (though no more in amount than many with aneurysms survive), the presence of relatively small quantities of subdural blood, are not enough to account for death

should be the last to deny that all of these things can cause death when they are severe enough. But it must be strongly asserted that the findings in human beings are often disappointingly small—disappointing, that is, to the mind which is prepared only for anatomical findings. Yet it is not these things, nor the petechial haemorrhages of classical times, which smell us most; it is rather their variability or their absence. To find nothing would be in line with the most informative of experimental evidence. This raises the question as to how it can come about that an initial lesion severe enough to cause cerebral paralysis can be survived though death occurs hours or days afterwards. There is no question about the fact that this can and does happen; and it is certain, it is sure. Only one explanation suggests itself—that an injury sets going a self-propagating event that leads sooner or later to death. It would be a mistake to draw too much on analogy, and any explanation must be regarded as both speculative and tentative. But death from burns, from fractures, and from haemorrhages will serve as shorthand notes indicating at least a parallelism. We can only speculate at the moment on what the answer will be in the case of cerebral concussion. It is the fate of all of us to watch patients with cerebral lesions dying from something characterized by tachycardia and cardiac irregularity, from upsets of thermal regulation, from metabolic disturbance which we have not yet found a means to study properly, from something that bears the hall-mark of a disease process as much as, say, pneumonia. The old beliefs in the omnipotence of the bulbar centres has been corrected by the discovery of the vital centres re-representing them at and above the tentorial level. Conceivably it may become possible to demonstrate alteration in oxidation-reduction mechanisms in this area which will afford an index of cellular pathology. It seems legitimate to suppose that the physical effects of injury lead to affection of at least one enzyme system, the lack of which can for a time be repaired by the altered energies of others, which also in turn give out. Thus, step by step, dissolution comes about. Only in such a way can temporary survival with final extinction be given a cause. And it will be recognized that the level at which all of these happenings occur is in the more primitive but still no doubt extremely complex and largely integrated neural mechanisms considerably below cortical level.

#### Conclusion

Although the beliefs expressed above have minimized the importance of the cortex in the picture of concussion, it is not my belief that cortical disturbances are absent. Electrical records clearly show that they are frequent; while some patients, by confusion, confabulation, and lack of insight (sometimes for many days after return to consciousness), demonstrate that the whole brain integration continues to be disturbed. It is not possible at the moment to do more than speculate on the causes and mechanisms of this dysfunction. The real point that I have wished to examine is the nature of unconsciousness, and I have endeavoured to show that there is a body of evidence attesting to its production in a relatively focal manner, and that the focus is not, as has been so generally believed, in the cerebral cortex.

#### BIBLIOGRAPHY

- Breslau, J. (1914). *Arch. klin. Chir.*, 103, 478.  
 Cairns, H., Oldfield, R. C., Pennybacker, J. B., and Whitteridge, D. (1941) *Brain*, 64, 273.  
 Denny-Brown, D., and Russell, R. (1941). *Ibid.*, 64, 93.  
 Fischer, H. (1870). *Samml. klin. Vor.*, No. 27, 1st ser., 119.  
 Fulton, J. F., and Bailey, P. (1929). *J. nerv. ment. Dis.*, 69, 1.  
 Globus, J. H. (1940). *Arch. Neurol. Psychiat.*, Chicago, 43, 125.  
 Greenfield, J. G. (1938). *Proc. roy. Soc. Med.*, 32, 43.  
 Harrison, F. (1940). *The Hypothalamus*, 20, 635, Assoc. Res. Nerv. and Ment. Dis.  
 Jefferson, G. (1938). *Arch. Neurol. Psychiat.*, Chicago, 40, 557.  
 (1942). *Quart. med. J.*, 138, 77.  
 Kleitman, N. (1939). *Sleep and Wakefulness*, Chicago.  
 Krauer, A., and Enderlen, E. (1922). *J. Psych. Neurol.*, 29, 1.  
 Kocher, T. (1901). *Hirnerkrankungen*, etc., Vienna.  
 Miller, G. (1927). *Arch. Surg.*, Chicago, 14, 891.  
 Penfield, W., and Erickson, T. (1941). *Epilepsy and Cerebral Localization*, p. 143, Springfield, Ill.  
 Ransom, S., and Agoum, H. (1939). *Ergebn. Physiol.*, 41, 56.  
 Symonds, C. P. (1940). *Concussion and Contusion of the Brain*, in Brock's *Injuries of the Skull, Brain and Spinal Cord*, Baltimore.  
 Trotter, W. (1932). *Choyce's System of Surgery*, 3, 363, London.  
 Von Economo, C. (1926). *Hirnh. norm. path. Physiol.*, 17, 591.  
 (1930). *J. nerv. ment. Dis.*, 71, 249.  
 White, J. C. (1940). *The Hypothalamus*, 20, 555, Assoc. Res. Nerv. and Ment. Dis.  
 Williams, D., and Denny-Brown, D. (1941). *Brain*, 64, 223.  
 Witkowski, L. (1877). *Virchows Arch.*, 69, 495.

## NUTRITIONAL DEFICIENCY IN THE PATHO-GENESIS OF DISEASE\*

BY

JOHN YUDKIN, M.A., M.D., Ph.D., F.I.C.

Lieut. R.A.M.C.; formerly Sir Halley Stewart Research Fellow at Dunn Nutritional Laboratory, Medical Research Council and University of Cambridge

More and more has the role of vitamin deficiency claimed our attention in recent years, and a variety of diseases and syndromes have been treated with a vitamin or a combination of vitamins. Frequently the reasons for doing this are obscure and the results of the treatment equivocal; and the relation between the condition and vitamin deficiency often remains difficult to assess.

Nutritional deficiency may be responsible for the production either of a recognized disease, of hitherto unknown aetiology, or of obscure signs and symptoms in an individual. For example, claims are sometimes made that vitamin deficiency plays a part in the production of renal lithiasis (Higgins, 1935) and certain muscular dystrophies (Bicknell, 1940). Again, a patient is seen with an unusual form of keratosis of the skin, or with oedema which does not easily respond to ordinary therapy, or with a sore tongue with few other signs or symptoms, or with an unusual type of subcutaneous haemorrhage: to what extent are vitamin A, vitamin B<sub>12</sub>, riboflavin, and vitamin C respectively implicated in the production of these disturbances in the individual?

In this paper I shall consider certain general principles which might act as a guide in the evaluation of the part played by vitamins in the causation of disease. Just as we use Koch's postulates in determining the role of specific bacteria in causing disease, so we may lay down the following criteria for assessing the role of nutritional deficiency in causing disease: (1) It should be possible to demonstrate the existence of a deficiency of the nutrient; (2) deficiency of the nutrient should result in the production of the disease; (3) the disease should be cured by replacement of the deficient nutrient. To satisfy each of these criteria,\* evidence may be collected in several ways:

#### Diagnosis of Nutritional Deficiency

##### Criterion 1.—Existence of deficiency

- A. General evidence of deficiency
  - (i) Evidence of inadequate diet
  - (ii) Evidence of defective absorption
  - (iii) Evidence of increased utilization
- B. Specific evidence of deficiency
  - (i) Laboratory tests for specific deficiency
  - (ii) Clinical tests for specific deficiency

##### Criterion 2.—Deficiency as the cause of the condition

- A. Evidence from animals
- B. Evidence from human beings

##### Criterion 3.—Cure of condition by correction of the deficiency

Therapeutic test

#### Criterion 1: Existence of Deficiency

The first criterion is that there should be evidence of nutritional deficiency in the condition. This evidence may be either general or specific.

##### A. General Evidence of Deficiency

There may be evidence of a deficiency in any part of the pathway between the nutrient and the tissues.

##### (i) Evidence of Inadequate Diet

A dietary history is an essential first step in diagnosis. The following conditions are especially apt to lead to an inadequate diet.

(a) *Low Income Levels*.—On the whole, foods which are good sources of vitamins are also more expensive; cheaper foods supply mainly calories (Orr, 1936).

(b) *War*.—Wartime measures, such as the introduction of the national loaf and the vitaminization of margarine, together with rationing, the price control of foods, and the distribution of cheap or free milk and fruit juices, have decreased the disparity between the diets of various classes. Nevertheless, there are many who still

\* Based on a paper read at a meeting of the Nutrition Society (Scottish Branch) at Glasgow, Aug. 26, 1942.

† Certain exceptions to the fulfillment of these criteria are discussed below.

cannot afford to buy the whole of their meat or bacon ration or to spend much on vegetables. Moreover, since war leads to restricted imports, to a decreased man-power for food production, and to the destruction of crops and other foodstuffs, it may be a potent cause in the production of deficiency disease.

(c) *Season*.—An example of the part played by this factor is the low level of vitamin C in foods in the spring and early summer. It is therefore at this time that the effects of its deficiency are most likely to be seen (Harris, 1942).

(d) *Geography*.—Differences in food production and dietary habits lead to the classical examples of geographic endemic deficiency disease such as the association of beriberi with the consumption of polished rice and pellagra with the consumption of maize.

(e) *Special Diets*.—Possibly the commonest cause of adult scurvy in Britain is the consumption of a too rigid "gastric" diet by patients with peptic ulcer, without adequate precautions for assuring the supply of vitamin C (Harris *et al.*, 1936). Also, beriberi has been reported in food cranks who have lived on a diet containing excessive amounts of highly purified carbohydrates. It is possible that the well-known occurrences of pellagra in mental hospitals are partly due to the perverted food habits of the patients.

(f) *Institutions*.—Outbreaks of deficiency diseases are often reported from institutions; nor is this surprising in prisons and asylums, where the allowance for food may not be sufficient to supply even the necessary calories. But the unique nature of institutional feeding may result in an inadequately balanced diet even if economic considerations do not restrict the choice of food. In the first place, the food and its preparation, for a large number of people, are in the hands of a few individuals, who may easily, through ignorance or lack of care, be responsible for a diet of poor quality. Secondly, the preparation of food on a large scale introduces new problems in connexion with the preservation of its nutritive quality; it requires special care, for example, to preserve the vitamin C (King *et al.*, 1942).

## (ii) Evidence of Defective Absorption

(a) *Water-soluble Vitamins*.—Many affections of the gastrointestinal tract appear to decrease the absorption of vitamins of the B group. Hyperemesis gravidarum (Strauss and McDonald, 1933) and alcoholic gastritis (Minot *et al.*, 1933) are often associated with deficiency of vitamin B<sub>1</sub>; in the latter condition there is probably a second factor in the diminished intake of the vitamin in the diet. Gastrectomy, colitis, and intestinal obstruction often lead to a complete deficiency of the vitamins of the B<sub>2</sub> group (B.M.J., 1942).

(b) *Fat-soluble Vitamins*.—The absorption of these substances is bound up with the absorption of fat. In obstructive jaundice, in which the absorption of fat is decreased, there is diminished absorption of vitamins A (Brees and McCoord, 1940) and K; it is known that the difficulty in controlling haemorrhage in obstructive jaundice is due to this "conditioned" deficiency of vitamin K (Warner *et al.*, 1938a, 1938b). The effect of large doses of liquid paraffin in hindering the absorption of carotene is another example of induced defective absorption of fat-soluble vitamins (Rowntree, 1931).

## (iii) Evidence of Increased Utilization

(a) *Pregnant and Lactating Women*.—In some degree pregnancy and lactation increase the demand for all the nutrients, including the vitamins. Osteomalacia and beriberi are examples of deficiency disease which may be precipitated by these increased physiological needs.

(b) *Heavy Manual Workers*.—It is likely that the utilization of many nutritional factors is greater with increased physical exertion. Many Europeans consume diets which probably contain no more vitamin B<sub>1</sub> than those consumed by many Chinese; the high incidence of beriberi among the latter is probably associated with the heavy work which they do.

(c) *Fever*.—There is apparently an increased destruction of vitamin C and possibly other vitamins during fever (Abbasy *et al.*, 1936, 1937; Harris *et al.*, 1937). Usually the primary condition, such as tuberculosis or rheumatic fever, overshadows deficiency of the vitamin, but this deficiency may play a part in delaying recovery or in the persistence of certain signs.

## B. Specific Evidence of Deficiency

This evidence may be obtained either by laboratory tests or by clinical tests.

### (i) Laboratory Tests for Specific Deficiency

(a) *Vitamin Concentration in the Blood*.—The determination of the blood concentration of vitamin A, B<sub>1</sub>, or C has often been used to assess the nutritional level in respect of these factors. The results of such investigations, however, appear to depend to a large extent on the immediate past diet, and give less indication of the more permanent nutritional state. A very short time on a diet high in vitamin A, for example, will lead to high blood levels although the subject still shows signs of deficiency (S. Yudkin, 1941); the converse is also true. To some extent this has been recognized with

vitamin C: estimations on the whole blood or plasma have been found to be less reliable as indices of vitamin C nutrition: estimations on the white-cell layer (Heinemann, 1938, 1941).

(b) *Vitamin Excretion in the Urine*.—With the water-soluble vitamins, the amount excreted in the urine, and especially the rapidity with which large doses are excreted, have been useful methods for detecting slight deficiency (Harris and Ray, 1935). Such tests have been employed mainly with vitamin C, but they are also proving of value in the diagnosis of deficiency of vitamin B<sub>1</sub> (Banerji and Harris, 1939; Wang and Yudkin, 1940) and nicotinic acid (Kodice and Wang, 1941).

(c) *Functional Tests*.—Slight deficiency of a vitamin often causes physiological or biochemical changes, which may be detected by the use of special techniques. Impaired dark-adaptation, capillary fragility, or a rise in blood phosphate has been used to demonstrate mild deficiency of vitamins A, C, and D. A rise in pyruvic acid in the blood or urine, particularly after the ingestion of glucose, has been suggested as a means of recognizing early deficiency of vitamin B<sub>1</sub> (Banerji and Harris, 1939). Unfortunately these methods, although of great value, have been used uncritically by some workers, and the published results have often been conflicting. The main reason for this is that tests such as dark-adaptation and capillary fragility appear superficially simple to employ, but in reality require most careful application and rigid control (Hecht and Schlaer, 1938; J. Yudkin, 1941; *Lancet* 1942; Yudkin and Ferguson, 1943).

### (ii) Clinical Tests for Specific Deficiency

Clinical examination may reveal signs which are similar to those seen in the known deficiency disease, or they may be found in association with such signs.

(a) *Signs Resemble Those in Recognized Deficiency Disease*.—The realization that the neuritis of alcoholism and that of pregnancy toxæmia were due to deficiency of vitamin B<sub>1</sub> came, partly at a rate, from the recognition of the similarity between these and the signs of mild "dry" beriberi. But this type of evidence must be used carefully: it has led, for example, to the quite illogical use of vitamin B<sub>1</sub> in neuritis of many sorts, including sciatica (Roch and Sciclounoff, 1938).

(b) *Signs Associated With Those of Recognized Disease*.—*Individuals*.—In individuals with signs of a deficiency disease the presence of other signs whose pathogenesis is obscure suggests that these are also due to the same deficiency. Thus obscure neurological signs found in Cingalese prisoners appear to be due to deficiency of vitamin A, since other signs of A deficiency—e.g., phrynoderma—were also present; moreover, beriberi is uncommon in Ceylon, and that the neurological signs were unlikely to be caused by deficiency of vitamin B<sub>1</sub> (Nicholls, 1935). In view, however, of the frequency with which multiple deficiency occurs, caution must be used in interpreting such findings. Until recently, for example, it was thought that some of the changes in the skin and tongue in pellagra were due to the lack of the pellagra-preventing factor. Only after the latter was isolated as nicotinic acid was it found that the signs were due to a superimposed deficiency of riboflavin (Yudkin, 1937-8; Sydenstricker, 1941). Incidentally, this type of evidence can be used in the opposite way: if certain obscure signs are found in association with signs of a deficiency disease it is unlikely that they are due to this deficiency. Thus it was at one time suggested that disseminated sclerosis and subacute combined degeneration of the cord were due to deficiency of vitamin A, but the fact that other signs of this deficiency are rarely found in these conditions makes it unlikely. *In a Population*.—If a deficiency disease is common in a certain population the same deficiency may often be the cause of other less well defined conditions. Much of so-called toxæmia of pregnancy in Hong Kong, where beriberi is common, has been shown to be due to deficiency of vitamin B<sub>1</sub> (Nixon, 1942).

## Criterion 2: Deficiency as Cause of Condition

Our second criterion—that the signs should be reproducible by deficiency of the suspected factor—may be applied either in human animals or in human beings.

### A. Evidence from Animals on Experimental Deficient Diet

Analogy from animal experiments has proved very useful in the recognition of signs of human deficiency. The production of haemorrhage due to lack of vitamin K (Dam and Schönheyder, 1932) and vascularization of the cornea due to lack of riboflavin (Wolf, 1937; Bessey and Wolbach, 1939) are examples of this. On the other hand, such analogy must not be carried too far, as has been done with vitamin E and the production of neuromuscular disease (Bicknell, 1940) or vitamin A and the production of neurological disease (McLanby, 1934).

### B. Evidence from Human Beings on Experimental Deficient Diet

As might be expected, there are many difficulties in conducting such experiments on anything like an adequate number of sub-



It is not surprising, therefore, that few have been reported. It could be expected that the results would be very convincing, but in fact the conclusions reached are often conflicting. Thus some workers have claimed that a dietary deficiency of vitamin A produces a deterioration in dark-adaptation within a few days (Hecht and Mandelbaum, 1940), while others have found no change after six or six months (Steffens *et al.*, 1939). It is possible that these divergent results are due to such factors as differences in individual requirement, differences in the stores of the vitamin before the experiment is begun, and differences in the composition of the deficient diet—that is, the possible concurrent existence of other deficiencies.

### Criterion 3: Cure of Condition by Correction of Deficiency

#### Therapeutic Test

Wherever possible, the effect of correction of the supposed deficiency should be observed. Here again, however, it is unfortunately true that many reports in the literature of the cure of symptoms and signs by the administration of a vitamin are vitiated by the failure to observe certain general principles. The commonest source of error is the use of inadequate controls, and especially the failure to allow for spontaneous remission. On the other hand, if a deficiency really exists, negative results may follow the administration of the missing factor. Often this is due to inadequate dosing or to defective absorption; in such cases large doses, if necessary given parenterally, must be tried. Failure to cure may be due to the fact that the pathological process has progressed so far; it is not always possible, for example, completely to cure longstanding peripheral neuritis of beriberi by the administration of vitamin B<sub>1</sub>.

A less well recognized reason for the failure to achieve improvement by the correction of an existing deficiency is the simultaneous existence of other deficiencies. It is often overlooked that a diet deficient in several factors, that the administration of only one of these may produce no improvement, and that this does not imply that the diet must necessarily have been adequate in this factor. For example, Peterhead children on diets undoubtedly deficient in vitamins A and D as well as many other nutrients were no better than the controls when given these substances (Sutherland, 1934). It was accepted in this experiment that deficiency of one or more other nutrients was the limiting factor in preventing improvement. Similar results were recently obtained in experiments on Cambridge deaf children (Yudkin, 1943). It is probable that the lack of effect of supplements of vitamin C in the oft-quoted experiment on South African miners (Fox *et al.*, 1940) was due to the simultaneous existence of multiple deficiency; restoration of an adequate supply of this one substance without increasing the supply of the other nutrients was itself not sufficient to affect the health of the workers, apart from decreasing the number of cases of frank scurvy.

Lastly, when a positive effect is obtained by the use of a vitamin supplement it is not always legitimate to assume that this has proved the existence of deficiency. The fact that vitamin C is diuretic and ceases to relieve the oedema of cardiac failure (Evans, 1938) does not of course imply that the condition is due to deficiency of the vitamin. In fact, as has been suggested, large doses of vitamin D have a curable effect on psoriasis (Bruns, 1938) it is not to be regarded that psoriasis is a deficiency disease. It is important, in other words, to distinguish between replacement therapy and pharmacological therapy.

#### General Comments

Diagnosis by rule of thumb, without consideration of biological realities, is to be deprecated no less with deficiency disease than it is with any other condition. We may mention a few of the more important considerations which must be borne in mind.

**Multiple Deficiency.**—Human diets are such that deficiency of one nutrient only is unlikely to occur. This means that Criterion 1 may indicate deficiency of a nutritive factor which is not the cause of the condition under investigation. It would appear that the signs which will occur in a multiple deficiency will depend partly on the relative extent of the various deficiencies and partly on the capacity of the organism to store the different dietary factors. On a diet completely deficient in the vitamin B complex, for example, rats will not certainly die of deficiency of vitamin B<sub>1</sub>, before developing signs of other deficiencies.

**Individual Variation in Requirement.**—It cannot be expected that all individuals have exactly the same requirements for the various nutritional components or that they would show the same signs when depleted of one or more of these components. It is possible that there are also racial as well as individual differences, as illustrated by the reported behaviour of

Rumanian and Russian prisoners in a German camp during the last war. It is stated (Bigwood, 1942) that all were on the same diet, yet the former developed pellagra and the latter scurvy.

**Other Constituents of the Diet.**—It has been shown that signs of deficiency of riboflavin can be considerably aggravated if the deficient subjects are dosed with other components of the B complex (Sebrell and Butler, 1938; Sydenstricker *et al.*, 1940), and there is similar experimental evidence in dogs (Morgan, 1941). This provides another reason for considering the whole of the diet in attempting the diagnosis of deficiency disease.

**Specificity of Tests for Deficiency.**—No single test can be held to prove deficiency. There are, for example, other causes of poor dark-adaptation than deficiency of vitamin A; other factors producing increased capillary fragility than deficiency of vitamin C. It is possible also to have a high level of vitamin A in the blood coexisting with definite functional deficiency of this vitamin.

Finally, it should be stressed that, even if deficiency has been proved, it may be the effect rather than the cause of the condition. An extreme example is deficiency of vitamin C in tuberculosis, in which it is clear that no one would suppose that the deficiency causes the infection. On the other hand, it should be remembered that, even when it is not the ultimate cause of a definite pathological state, deficiency may be a predisposing cause. It is likely, for example, that deficiency of either vitamin C or nicotinic acid renders the individual more readily susceptible to ulcerative stomatitis.

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#### REFERENCES

- Abbasy, M. A., Hill, N. G., and Harris, L. J. (1936). *Lancet*, 2, 1413.  
 —Harris, L. J., and Hill, N. G. (1937). *Ibid.*, 2, 177.  
 Banerji, G. G., and Harris, L. J. (1939). *Biochem. J.*, 33, 1346.  
 Bessey, O. A., and Wolbach, S. B. (1939). *J. exp. Med.*, 68, 1.  
 Bicknell, F. (1940). *Lancet*, 1, 10.  
 Bigwood, E. J. (1942). *Proc. Nutrit. Soc. (in the press)*.  
 Breese, B. B., and McCoord, A. B. (1940). *J. Pediatr.*, 16, 139.  
 British Medical Journal (1942). 1, 77.  
 Bruns, L. A. (1938). *Proc. Mayo Clin.*, 13, 280.  
 Dam, H., and Schöbheyder, F. (1934). *Biochem. J.*, 28, 1355.  
 Evans, W. (1935). *Lancet*, 1, 308.  
 Fox, F. W., Dangesfeld, L. F., Gutlich, S. F., and Joki, E. (1940). *British Medical Journal*, 2, 143.  
 Harris, L. J. (1942). *Lancet*, 1, 642.  
 —Abbasy, M. A., and Yudkin, J. (1936). *Ibid.*, 1, 1458.  
 —Fassmore, R., and Pagel, W. (1937). *Ibid.*, 2, 183.  
 —and Ray, S. (1935). *Ibid.*, 1, 71.  
 Hecht, S., and Mandelbaum, J. (1940). *Amer. J. Physiol.*, 130, 651.  
 —and Schlafer, S. (1938). *J. agric. Sci. America*, 28, 269.  
 Heinemann, M. (1935). *J. clin. Invest.*, 1, 751.  
 —(1941). *Ibid.*, 20, 39.  
 Higgins, C. C. (1935). *J. Amer. med. Ass.*, 104, 1296.  
 Kite, E. J., *et al.* (1942). *Lancet*, 1, 207.  
 Kodicek, E., and Wang, Y. L. (1941). *Nature*, 148, 23.  
*Lancet* (1942). 2, 699.  
 Mellanby, E. (1934). *Nutrition and Disease*, Edinburgh.  
 Minot, G. R., Strauss, M. B., and Cobb, S. (1933). *New Engl. J. Med.*, 209, 1244.  
 Morgan, A. F. (1941). *Science*, 93, 261.  
 Nicholls, L. (1935). *Irish med. Gaz.*, 70, 559.  
 Nixon, W. C. W. (1942). *Proc. Nutrit. Soc. (in the press)*.  
 Orr, J. B. (1936). *Food, Health and Income*, London.  
 Roch, M., and Sclavounoff, F. (1935). *Schweiz. med. Wschr.*, 65, 1343.  
 Rowntree, J. L. (1931). *J. Nutrit.*, 3, 345.  
 Sebrell, W. H., and Butler, R. E. (1935). *Publ. Hlth. Rep.*, Wash., 52, 222.  
 Steffens, L. F., Bair, H. L., and Sheard, C. (1939). *Proc. Mayo Clin.*, 14, 648.  
 Strauss, M. B., and McDonald, W. J. (1933). *J. Amer. med. Ass.*, 100, 1322.  
 Sutherland, R. (1934). *British Medical Journal*, 1, 791.  
 Sydenstricker, V. P. (1941). *Ann. intern. Med.*, 14, 1899.  
 —Sebrell, W. H., Cleckley, H. M., and Kruse, H. D. (1940). *J. Amer. med. Ass.*, 114, 2437.  
 Wang, Y. L., and Yudkin, J. (1940). *Biochem. J.*, 34, 343.  
 Warner, E. D., Brinkhous, K. M., and Smith, H. P. (1938a). *Amer. J. med. Sci.*, 196, 50.  
 —(1938b). *Proc. Soc. exp. Biol.*, N.Y., 37, 628.  
 Wolbach, S. B. (1937). *J. Amer. med. Ass.*, 109, 73.  
 Young, T. C. M. (1937-8). *Indian J. med. Res.*, 25, 455.  
 Yudkin, J. (1941). *British Medical Journal*, 2, 747.  
 —(1943). *Lancet*, 1, 755.  
 —and Ferguson, A. (1943). *British Medical Journal*, 1, 633.  
 Yudkin, S. (1941). *Lancet*, 2, 757.

A. V. Hardy (*Publ. Hlth. Rep.*, Wash., 1943, 58, 833) used sulphadiazine in the treatment of 19 chronic typhoid carriers, 4 convalescent carriers (including one treated as a case), 21 clinical cases, and 1 clinical relapse, with the following results. Quantitative cultural tests showed that sulphadiazine had a marked bacteriostatic effect on *Eberthella typhosa* in the enteric tract, but that the chronic carrier state was not terminated by this treatment.

## THE PRISONER-OF-WAR MENTALITY ITS EFFECT AFTER REPATRIATION

BY

P. H. NEWMAN, D.S.O., M.C., F.R.C.S.

Major, R.A.M.C.

In 1919 Dr. A. L. Vischer wrote a small book entitled *Barbed-Wire Disease: A Psychological Study of the Prisoner of War*. It deals briefly with the factors producing this "disease" and with the prisoner's reaction to his environment during prison life. Dr. Vischer was a visiting doctor in German prisoner-of-war camps during the last war; he drew his conclusions not as a prisoner of war but as a psychologist studying a series of patients. His experience was vast, and his conclusions were drawn from an immense amount of data. In this short article I wish to give an impression not of a doctor examining his patients but that of a prisoner of war himself.

The number of prisoners ultimately returning to this country alone will be many hundreds of thousands, and that to countries throughout the world millions. It is quite obvious, therefore, that the organization dealing with repatriation of these people constitutes one of our more important post-war problems. The return of these prisoners will entail a flooding of our own country with men and some women who have experienced circumstances not necessarily harder but quite different from the majority of others. Those at home will welcome them as few are privileged to be welcomed, not because they have lived through worse conditions or have been more badly wounded or mutilated or have shown greater courage in facing more frightful scenes than others, but because they have lived in the valley of darkness.

During this period of enforced imprisonment they have adopted a certain mental attitude—a frame of mind compatible with camp life. Dr. Vischer has traced most carefully the origin of this mental attitude and discussed in detail its symptoms during camp life; he has not, however, described the symptoms after release from the camp. It is perfectly easy to understand the reason for a prisoner's depression while confined in a small space, crowded, and in an atmosphere of irritability. It is far less understandable that this attitude should persist on the prisoner's return to conditions to which he was normally accustomed. Broadly speaking, a prisoner's reactions in the camp are of minor importance in comparison with those which he shows on return to his normal life when he may again be beset by large responsibilities.

In medical textbooks we are familiar with what is called caisson disease. While in an underwater or compressed-air caisson such as is used in tunnelling, the bodies of the workers adapt themselves to an environment in which the atmospheric pressure is abnormally high. While working in this situation men show no abnormal symptoms, but when the caisson is raised or when they are released from it, the pressure falls back to normal and symptoms are apt to appear as a result of liberation of nitrogen bubbles from the blood. These symptoms do not always occur, but are usually the result of a too rapid fall in atmospheric pressure—that is, on a change of environment which the body finds too rapid for proper adaptation.

When a number of men are released from the same caisson, all of whom have been submitted to the same atmospheric pressure, some will show symptoms and some will not. A batch of men exposed to a high pressure for a long period will be more likely to show symptoms than a batch exposed to a low pressure for a short period. It is apparent, therefore, that the presence or intensity of these symptoms will mainly depend upon the following factors: (1) the individual himself; (2) the length of the period of immersion; (3) the pressure within the caisson. This response of a normal body to the process of recovery from exposure to an abnormal external environment is wrongly called a disease. It is the change-over from an adaptation to abnormal external influences. The

returned prisoner of war is placed in conditions which are some parallel to those who suffer from caisson disease.

If we bear this parallel in mind we may say that in repatriated prisoner the appearance of symptoms will depend upon: (1) the individual temperament; (2) the period of time within the camp; and (3) the gravity of conditions. (By gravity of conditions is meant not necessarily the degree of physical discomfort and the occurrence of atrocities, but the intensity of factors which the prisoner feels are of psychological importance.)

The effects of internment are twofold, and can crudely be divided into physical and mental. The physical effects are easily described and easily accounted for. Their treatment after release is probably a matter of good food, elementary medicine, and pleasant conditions. It is not the object of this article to discuss these problems, which are already recognized and can usually be treated without difficulty. The possibilities and limitations of physical rehabilitation are common knowledge among the medical profession. Unfortunately this is not the case in mental convalescence, where, as doctors, we still tend to flounder in directing treatment. Formerly, what we call common sense was the guiding principle and it will remain so unless some very clear and rational indication for additional methods arises. The use of individual psychological treatment for any returned prisoner of war seems to be debatable; it may carry with it a public acknowledgment of mental abnormality, which must at all costs be avoided. This will be discussed more fully later when the long-distance guidance of such cases is discussed.

Barbed-wire disease, as has been said, is a misnomer, wrongly called a disease, and perhaps is better termed a mental attitude. This mental attitude is built up from a series of four phases through which the average internee passes. They are quite definite in occurrence but nebulous as to length and intensity. The officer prisoner of war has been chosen for discussion for two obvious reasons—first, the contrast between his normal life and his prison life is greater; and, second, during internment he remains unemployed and therefore has to rely on his own resources to dispose of his time.

### Stage I: The Breaking-in Period

This is by far the most unpleasant of the four stages because it is essentially the time of the acute mental strain which accompanies forcible adaptation to a lower plane of existence. The captive realizes very quickly the loss of friendship, association, the loss of his own reputation and prestige, the absence of the sunshine of his own propaganda, and the power of the opposing propaganda. The lot of the man who was taken prisoner in France after three weeks of exhaustive retreat may well serve as an example. Within a month he was switched from the pleasant life of a pseudo-peace-time Army into the grip of Nazi persecution. Bewildered by the falsity of his own propaganda and disillusioned as to the might of his own country, hungry and fatigued to the extreme, he was moved into Germany. He was taken in by forced marches, given practically nothing to eat, and shot if he fell by the wayside. Lack of clothes, lack of personal belongings, and, above all, the vision of five to ten years as a prisoner of war were some of the factors which combined to make the prisoner a truly wretched creature. During this period there first arose the longing for freedom, for home, security, female society, and, above all, for sympathy. This suppressed longing for sympathy remains, and is stored up until the day of repatriation, when it crops up in different ways.

### Stage II: Period of Convalescence

This is the period of recovering morale. The prisoner, having reached the depth of his depression, gradually reawakes to the life around him. He licks himself and his wounded pride, opens his eyes, and finds that far away on the horizon there is still a ray of sunlight left. Now he begins to shake and to undress when going to bed, to talk intelligently, to plan and to organize his life. He grasps at the small things which give him pleasure and builds his life around them. At this time, typically, he gathers together what little personal belongings remain to him. He searches the camp for a piece of wood and fixes it to the wall near the head of his bed.

On this shelf he sets a photograph, a pipe, a favourite book, anything else which represents to him a home in miniature. During the period of increasing morale the prisoner develops a sense of revenge, and is not long in realizing that revenge is impracticable. The consequent sense of frustration may easily be turned into a grudge against his own Government and higher Service officials. During this period of recovery there is possibility of a reason or an object for living gradually emerges and forms itself from the all-enveloping fog of altered values. Some find this image more quickly and realize it more clearly than others. They are the fortunate ones who adapt themselves more readily to prison life. Others, to find the definition of this image more difficult, remain restless, discontented, more indefinite in their prison day routine, and are liable to store up from frustrated revenge a heavy grudge against the future if it does not come up to expectations. Let it not be forgotten that many prisoners of war have not seen a friendly person outside the barbed wire for over three years. This lack of external friendliness and encouragement plays a large part in focusing the prisoner's thoughts and ideas in introspective channels.

### Stage III: The Lengthy Period of Boredom

During this period we see the prisoner in his usual state. He has done his best to accommodate himself to a life in a nutshell. He has looked into the uncertainty of the future and weighed up the possibilities of his eventual home-coming.

Dr. Vischer has pointed out, this uncertainty of the duration of imprisonment is a demoralizing factor. The criminal prisoner can plan his life to the duration of his imprisonment, the prisoner of war cannot.

The significance of the absence of female society as a factor in the formation of the prisoner's attitude appears to give rise to much controversy. In discussing sexual deprivation it is important to distinguish between the restricted meaning of this phrase—i.e., actual sexual intercourse—and the broader meaning—i.e., the whole sphere of association between the sexes and all that it entails. There can be little doubt that, in a broader sense of lack of affection, sexual deprivation is not only a fundamental but the fundamental factor in the formation of the prisoner-of-war attitude. Deeply within the prisoner, but seldom expressed, there lies the fear of becoming an forgotten man. In 1941, after a year or so of imprisonment, some two hundred and fifty officers were gathered together to listen to a newly arrived Air Force prisoner. He was giving a recapitulation of the events in England since Dunkirk. Interesting his talk was, nothing stirred the audience so much as when he concluded by saying, "And, chaps—the girls still love you." This acute emotional reaction after this was plainly obvious. The proof of this need can be seen in the meticulous care with which every word of letters is read and sifted. Hours are spent in making an elaborate checking and filing system of incoming and outgoing mail, and statistics are kept of its value.

The importance of the absence of actual sexual intercourse probably depends a great deal on the temperament of the individual. Even although it is untrue, it is quite common among Italian prisoners of war to believe that he will become sexually deranged without this physiological act. I have heard this view expressed also by French prisoners, but never by British or German prisoners of war. A quite unfounded fear of impotence was frequently the reason for a prisoner's seeking medical advice and reassurance.

Overcrowding, with the impossibility of ever being alone for work, was a source of irritation and a good excuse for idleness at all.

Part from all these demoralizing influences there are several aspects of this life which produce other but equally damaging effects. In the camp the prisoner is relieved from the struggle for life; he no longer has to work for his living, shoulder responsibility, or worry financially. Nothing that he does in the camp can relieve any threatening situation at home, therefore his occupations lose their significance as actual vital importance and become merely a pastime to amuse himself and defeat his own boredom. There is no stimulation in him to work, and what he achieves matters very little to his present state. He may spend three months making a model

boat, and if he wishes he can spend six, for nobody will interfere; there is no competitive element, and time is of no importance. This attitude and this lack of responsibility tend to make him small-minded and childish. Conversation centres around small events within the sphere of the camp, events which are of no consequence to the outside world. This lack of stimulation builds up a predisposition to be unduly troubled by the everyday struggle for existence which has to be met, once again, after release.

The unemployed prisoner of war has three main ways in which he may lead a constructive life, the choice varying according to his temperament: (i) work which will be of value to him after release; (ii) welfare work among his fellow-prisoners; (iii) escaping and sabotage. Most prisoners mould their occupation around one or more of these three. The minority which does not adopt any one of these seriously is building up greater difficulties at the time of readjustment following release.

### Stage IV: The Repatriation Period

The returning prisoner arrives back in his home country keyed up to a high pitch and full of expectation for the pleasures to come. He is stimulated, after years of looking from the other side of the river, into a state of exaggerated optimism and false hope. Much, for the future, will depend upon the state of his home conditions. The repatriate who finds his family and his intimates as he hoped to find them, ready to listen sympathetically and to share his experiences, however trifling they may have been, is already half-way on the road to recovery. He must regain his emotional balance before he can again assume the responsibilities of his former life. Here in the bosom of his family he may live quietly, and gradually catch up with the years that have been lost to him. Here are those who have lived these years for him and are willing to share their experiences and help him over the gap of wasted time. From this sound emotional foundation of his convalescence he will stand every chance of regaining his normal appreciation of the difference between work and relaxation and of his need for both in certain proportions. Greater difficulties are apt to beset the returned prisoner who is not so fortunate. In wartime many factors tend to upset the happy balance of affairs, and consequently grave gaps and differences are apt to appear. During this repatriation period abnormal reactions are common; in fact, probably all prisoners of long standing will present symptoms to some degree. The factors on which the occurrence of symptoms will depend are those described above, with the addition of the conditions awaiting the prisoner on return home. Briefly, these symptoms are restlessness, irritability, disrespect for discipline and authority, irresponsibility, and even dishonesty. Other symptoms that occur are the fear of enclosed spaces, especially a fear of large crowds in confined spaces, cynicism, embarrassment in society, rebellious views against any code which tends to restrict the repatriate's activities, and a tendency to quick and violent tempers.

All men returning from overseas, and especially those who have been in isolated areas for long periods, will show these symptoms to a certain extent, but seldom to so marked a degree as in the prisoner of war who has been through conditions which are usually held to be more damaging in the psychological sense: this, too, the prisoner knows and feels. It is important that the returned prisoner of war who shows these symptoms shall not be regarded as abnormal. Some may think him peculiar, rude, objectionable, and unreliable; but they must be helped to realize that he is a normal person attempting to bridge a gap in his life, often with poor or insufficient material.

This syndrome, when it exists, should pass off after six months to one year, and thus those affected should give rise to no concern. There are two types, however, which will give cause for anxiety: (i) the repatriate with exaggerated symptoms, (ii) the repatriate with persistence of symptoms. If individual treatment of any sort is ever indicated it will be in one of these two types. The first type is associated with symptoms of severe restlessness, irritability, emotional outbursts, acute discontent, and possibly excessive alcoholism. The second type shows chronic apathy, loss of initiative, and loss of



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*Technique.*—The routine adopted for patients with previously normal or only slightly irregular menstrual histories consisted of one intramuscular injection of 1 mg. of prostigmin on three successive days, this treatment being discontinued if after the first or second injection the menstrual flow was restored. With the exception of two cases which failed to respond, the longest interval between the last injection and the onset of menstruation was about 72 hours. These periods were normal in quantity and duration, and in two cases biopsy proved the flow to be of a truly menstrual character.

Table of Results	Bleeding Occurred

2	..	..	10	
3	..	..		
	Control	..		

Group 1: Pregnant patients.  
 Group 2: Poorly selected cases; 4-mg. doses of prostigmin injected, only occasionally 1 mg.  
 Group 3: Properly selected cases; 1-mg. doses given from the beginning.  
 Controls: Out of Groups 2 and 3; sterile water injected.

A 2-para. Has always had regular periods and April with a delay of three weeks. After prostigmin. After one test.

Group 1: Pregnant patients.  
Group 2: Poorly selected cases; 1-mg. doses of prostigmin occasionally 1 mg.  
Group 3: Properly selected cases; 1-mg. doses given from the beginning. Out of Groups 2 and 3; sterile water injected.

**Illustrative Case.**—A 2-para. Has always had regular periods, and presented herself in March and April with a delay of three days each time. She was treated with prostigmin. After one injection of 1 mg. on each occasion a normal period started. In August she had a delay of 8 days. Two full courses of prostigmin at an interval of 8 days had no effect. An A.-Z. test was returned positive, and later the pregnancy was confirmed clinically.

**Complications**

A number of patients complained of frequency of micturition and giddiness. One woman with a menstrual delay of 8 days complained, 20 minutes after the second injection of 1 mg., of "a film before my eyes, strong palpitations, sickness, and a terrific rush of water which came out of my mouth." She rapidly recovered from the attack without treatment. The action of prostigmin on the salivary secretion may conceivably have been the cause of some of these symptoms (Wright, 1940). This was the only really unpleasant incident in the series.

**Conclusions**

The patient and the length of the treatment are the factors determining the cases.

**Conclusions**

It appears that the age of the patient and the length of the menstrual delay are not decisive points in selecting the cases; some observers have reported successful treatment in patients with a delay up to 52 days. The character of the previous menstrual cycle, which should have been quite regular or have shown only slight variations, is of greater importance. Prostin is reliable in its action, as is shown by its success in 94.5% of this series. One wonders whether the two failures may not have responded to a fourth injection or to slightly larger doses. The drug causes some minor discomfort of a transient and not serious character, but it is quite safe and pregnancy is not disturbed.

The type of patient we had to deal with raises the question whether a wait-and-see policy or any other "psychological treatment" may not have been followed by similar success in a considerable percentage of cases. The injection of sterile water in 10 cases, previous to the proper prostigmin course, gave entirely negative results. Even if it were true that in cases of "functional amenorrhoea" the period will appear sooner or later with rest, tonics, etc., it should be borne in mind that prolonged amenorrhoea may lead to atrophic changes in the uterine muscle. The results are encouraging, and prostigmin deserves further clinical trial. We would suggest that the drug should be tried in all cases of delayed period except those of endocrine origin and those in which pregnancy has been established. Further clinical work may also reveal interesting effects of prostigmin in cases of dysmenorrhoea.

Summary

**Summary**

Ninety cases of amenorrhoea were treated with prostigmin. From 1 to 3 injections of 1 mg. were given.

The results obtained were favourable: in 94.5% of the cases of delayed period not due to pregnancy the menstrual flow was restored.

Prostigmin is safe; from its use no serious ill effects were observed. There is no tendency of the drug to interfere with the course of pregnancy.

REFERENCES  
Med. Ass.,

REFERENCES

Carapetyan, H. (1943). *J. Amer. med. Ass.*, 122, 81.  
Hechler, Oscar, Lev, Maurice, and Soskin, Samuct (1940). *Endocrinology*, 25, 1.  
Pertlow, Samuct (1939). *J. Pharmacol.*, 66, 66.  
Reynolds, R. S. M. (1939). *J. Physiol.*, 95, 258.  
Soskin, S., Wuchel, H., and Hechler, O. (1940). *J. Amer. med. Ass.*, 114, 2.  
Winkelstein, L. B. (1942). *Amer. J. Obstet. Gynec.*, 44, 231.  
Wright, Samson (1940). *Applied Physiology*. London.

A Case of Dysentery associated with  
*Bact. alcalescens*

**A Case of Dysentery**  
**Bact. alcalescens**

The following case may be considered of interest seeing that only in the last few years has *Bact. alcalescens* been recognized as an organism capable of producing acute dysentery. Nabar and Edward's (1939) paper on this subject has induced us to regard the case as worthy of record.

CASE RECORD

On 25. was admitted to hospital with diarrhoea for six weeks.

CASE RECORD

Mrs. M., a nursing sister aged 25, was admitted to hospital on Sept. 9, 1941, with a history of intermittent diarrhoea for six weeks. After admission her stools presented typical dysenteriform appearances, and she was given appropriate medicinal and dietetic treatment. At no time was she acutely ill, nor did she have much pain. Under treatment she improved, but blood and mucus in stool amounts persisted in the stools for some weeks. On Sept. 9 a stool, submitted before admission, consisted of gross blood-clot with out visible faecal matter; it was cultured on two Wilson and Blair plates and tetrathionate broth (paratyphoid infection was suspected also on two MacConkey plates. The Wilson and Blair plates were covered to be entirely negative. Both MacConkey with a few colonies to a profuse growth of non-lactose-fermenting organism was identified as *B. coli*. The non-lactose-fermenting organism was identified from its cultural and fermentative reactions by the E.M.S. Laboratories as *Bact. alcalescens*, but was not agglutinated by either of the sera available for this organism in the National Collection. Stools examined on Sept. 23 and Oct. 10 and 18 all contained small quantities of blood-stained mucus, and all, on culture on MacConkey plates, gave a heavily preponderant growth of *Bact. alcalescens*. Serum only a few colonies of *B. coli* and *B. lactis aerogenes*. The paratyphoid group. Serum obtained on Oct. 13 showed no agglutinins for the patient's own strain of *Bact. alcalescens*. This was confirmed by the E.M.S. laboratories, which also tested for agglutinins for all the available strains of dysentery bacilli, with a negative result.

On Nov. 4 a live broth culture of *B. acidophilus* was administered for a fortnight. A stool examined on Nov. 8 contained a negative result to tests for *B. coli* and *B. lactis aerogenes*, but a few colonies of *B. acidophilus* were present.

From Nov. 4 a live broth culture of *B. acidophilus* was administered daily for a fortnight. A stool examined on Nov. 8 contained no blood or mucus, and gave a negative result to tests for occult blood, and on culture showed only *B. coli* and *B. lactis aerogen*. A stool examined on Nov. 21 contained no blood or mucus, but a small number of *Bact. alcalescens* were found, with numerous *B. coli*. As the patient was now free from all symptoms she was discharged from hospital.

It has been suggested that the absence of agglutinins is again the causation of dysentery by *Bact. alcalescens* in this case. I find this hard to believe in view of its presence in overwhelming numbers and the complete failure to discover any other cause in spite of repeated examinations.

The apparent clearing up of the remaining symptoms after the administration of *B. acidophilus* culture is suggestive, might, we think, be of use in other similar cases.

ARTHUR C. INGRAM, M.D., M.R.C.P., D.P.H.  
FRANZ A. HEIMANN, M.D., L.R.C.P.

REFERENCE  
Bact. Rev., 49, 51:

A Case of Cystic Hygroma

The following case may be considered a warrant publication.

Early in Sept., 1942, a child aged 20 months was brought to me by her mother, who had noticed a swelling in the left side of neck, gradually becoming more apparent since birth. I found a rounded swelling above the outer half of the left clavicle, diagnosed a lipoma. I advised leaving it alone unless it showed signs of growing or caused pain. About a year later she was brought back to me with the complaint that the swelling was growing. It was apparent on examination. The child was admitted to H. and Wexlstone Hospital, and on Sept. 25, 1943, under general anesthesia, a large cystic tumour was dissected out apparently completely.

extended from one and a half inches below and behind the clavicle to a point near the middle line of the neck behind and up to the trapezius, and was also adherent to the posterior border of the sternomastoid. The cyst was multiloculated and contained straw-coloured fluid. The pathological report from the Middlesex Hospital laboratory was: "The mass consists of oedematous connective tissue with varying-sized spaces lined by a very thin layer of endothelial cells. A fair number of blood vessels are present, but no blood spaces. The picture is that of a cystic hygroma." The wound was drained for 48 hours owing to the size of the abscess, and healed without any apparent discomfort to the child.

HAROLD E. THORN, M.B., B.S.

## Thrombocytopenic Purpura following N.A.B. Injections

This is a case of thrombocytopenic purpura following N.A.B. injections in a congenital syphilite. It is placed on record because of the severity and acuteness of the symptoms and extreme reduction in the platelet count.

### CASE HISTORY

The patient, a soldier aged 30, was admitted on April 20, 1943, his complaint was bleeding from the gums for three days, bruising of the limbs, and petechiae all over the body for two days. He gave a history of having been treated with bismuth and arsenic for the past eighteen months for syphilis. The bleeding from his gums started about four hours after his last arsenic injection. He had no previous history of bleeding.

On examination the patient was seen to be a well-nourished man with a good colour. No clinical evidence of anaemia was present. There were petechial haemorrhages all over his body, large bruises on his limbs, and a slight oozing of blood from his gums. The spleen was not palpable. No abnormality was detected in heart or lungs. His pupils were equal, central, and circular, and reacted to light and accommodation. Knee- and ankle-jerks were absent and plantar responses were flexor on both sides. There were no sensory changes. His blood count on admission was: R.B.C., 4,130,000; Hb., 5.800; Hb., 78%; C.I., 0.95. The differential white cell count was normal. Platelets numbered 4,130 per c.mm. The red cells showed anisocytosis, with many crenated forms. There were no nucleated red cells. Clotting time was 64 minutes (normal 4 minutes) (capillary method used). Bleeding time was 14 minutes (normal 3 to 6 minutes).

On April 22 the patient complained of acute pain in the right costo-vertebral angle extending down to the groin, and passed blood-stained urine. He was given vitamin P, ascorbic acid, sodium dihydrophosphate intravenously, and massive doses of potassium citrate. In the 23rd the bleeding from the gums and the haematuria increased. During the day one pint of Group O (IV) blood was transfused as a slow drip. There was a slight improvement in the patient's condition after this, and the bleeding from the gums became much less. His blood count was now: R.B.C., 4,020,000; Hb., 11,700; Hb., 76%; C.I., 0.95. Platelets had fallen to 3,000 per c.mm. On the 24th it was noticed that there was a rather diffuse swelling just beneath his mandible. He was given two pints of whole blood by slow drip (54 hours). He improved a little after this, and the bleeding from the gums almost stopped. On April 25 his gums started to bleed again and he had haematuria. He was given 1 c.cm. of colloidal calcium every six hours and 2 c.cm. of ahaematin intramuscularly. That night he seemed very much improved, but in the early hours of the 26th he suddenly died.

At necropsy the findings were as follows: "There were numerous petechiae all over the body. There was also slight jaundice. The lungs were oedematous and the trachea was filled with blood-stained sputum. There was a recent pleurisy. The external surface of the heart was covered with petechiae. There were large haemorrhages to the mesentery. The liver (1,475 g.) was congested, and there were numerous petechiae on its surface. The kidneys were congested and the pelvis filled with blood-clot. The spleen (250 g.) was soft." The bone marrow was, unfortunately, not examined.

### DISCUSSION

In 1930 Bamforth and Elkington recorded four similar cases following N.A.B. and other antisyphilitic preparations. They found only 19 cases in the literature, and 10 of these were fatal, treatment with blood transfusion and liver extract having no effect. Scarborough and Stewart (1938) and Scarborough and Horne (1940) showed the value of vitamin P (hesperidin) in the treatment of purpura occurring as a toxic manifestation of arsenic and bismuth in the treatment of syphilis.

In the present case vitamin P and all treatment proved of no avail. Blood transfusions caused only temporary improvement in the condition.

I am indebted to Dr. T. J. Hennelly, medical superintendent, for permission to publish this case, and to Dr. J. M. Naftalin for carrying out necropsy and laboratory investigations.

G. M. LEWIS, M.B., B.Ch.

### REFERENCES

- Bamforth, J., and Elkington, J. St. G. (1930). *Quart. J. Med.*, 24, 381.  
Horne, G., and Scarborough, H. (1941). *Lancet*, 1, 412.  
Scarborough, H., and Horne, G. (1940). *Ibid.*, 2, 66, 644.  
— and Stewart, C. P. (1938). *Ibid.*, 2, 610.

## Reviews

### TECHNIQUE OF BLOOD GROUPING

*Blood Grouping Technique: A Manual for Clinicians, Serologists, Anthropologists, and Students of Legal and Military Medicine.* By Fritz Schiff, M.D., and William C. Boyd, Ph.D. With foreword by Karl Landsteiner. (Pp. 248. 55.00) New York: Interscience Publishers Inc. 1942.

Schiff's contributions to our knowledge of blood groups were numerous and important, and ten to fifteen years ago his book *Die Technik der Blutgruppenuntersuchung* was of great use. Before his untimely death Schiff had been for some years in America, and there he sought the help of W. C. Boyd, another well-known worker in the field, in the preparation of an up-to-date account of blood grouping somewhat on the lines of his German book. The plan of the book was Schiff's, and it was more than half finished when he died. From such a source a modern work was bound to be important, and *Blood Grouping Technique: A Manual for Clinicians, Serologists, Anthropologists, and Students of Legal and Military Medicine* is packed with information. It is essentially a book in which to look up points, and the arrangement of the matter in short sections numbered on a decimal system greatly helps reference and cross-reference.

Experienced workers will disagree with many things in it, and beginners will probably be confounded by the elaboration of the complexities and pitfalls. Blood grouping is far from being a simple business, and knowledge of the difficulties is essential for success; but in reading the book the reviewer has several times been struck by a sense of unreality in parts of the subject-matter, and has wondered whether some of it has been written by a theoretical rather than a practical blood grouper. From a lengthy list of things that might be criticized, queried, or contradicted, a few may be mentioned. On page 27 it is recommended that before use the efficiency of anti-A sera for A<sub>2</sub> cells should be tested; no mention is made of testing against A<sub>2</sub>B cells in which the A may be very much weaker than in A<sub>1</sub>. There is little danger of anti-A serum worth anything at all missing A<sub>2</sub> cells, the danger is with A<sub>2</sub>B. Perhaps it is only inadvertently that it is suggested near the bottom of page 38 that 50% of group AB are A<sub>2</sub>B. Actually the proportion of A<sub>2</sub> is the same in A and AB—about one in four or five in this country and the U.S.A. The advice on page 42 to use a technique which fails to disclose weak irregular reactions is very bad; this is the way to miss weak A in the AB group. On page 57, "Sometimes more practice and skill are needed for these [MN] tests than for routine blood grouping..." is an amazing understatement. Accurate MN work needs very great experience. The statement on page 58 that transfusion of blood of one group into a patient of a different group is "often" successful where the donor's cells do not meet homologous antibodies in the recipient's serum misrepresents the situation; "often" should be omitted.

The book is not merely a manual on technique; there are sections on transfusion, blood donor services, blood substitutes, the Rh factor, medico-legal grouping, anthropology, and, in fact, on everything found in other textbooks on blood grouping. Perhaps the subject is too big nowadays for really adequate treatment by one or even two authors. In the sections on transfusion, donors, and blood substitutes practically no mention is made of what has gone on in this country since the war began. Yet in spite of its defects the book will be very useful, and the reviewer intends to keep a copy handy in the laboratory.

### INSECTS OF MEDICAL IMPORTANCE

*A Handbook for the Identification of Insects of Medical Importance.* By John Smart, Ph.D. With chapters on Fleas by Dr. Karl Jordan, F.R.S., and on Arachnids by R. J. Whittick, B.Sc. British Museum (Natural History). (Pp. 269; illustrated. 15s.) London: Printed by Order of the Trustees of the British Museum. 1943.

Identification of a pest insect is to an entomologist what diagnosis is to a doctor. In this country it is possible to have one's conclusions checked by a museum expert within a short time. But many entomologists and medical men are confronted with noxious insects and insect-borne diseases in the remoter parts of the world where they depend on their own powers

of identification. On such occasions the readily workable keys provided by this book will be of inestimable value.

The scope of the book is strictly defined by its title: for its 269 pages are allocated, to a large extent, according to the difficulty of identification and the medical importance of the various groups. One hundred pages are accorded to mosquitoes and 75 to the remainder of the diptera, while other insects (except the fleas) claim only 10. It is possible that Dr. Smart's intimate knowledge of and interest in the diptera have slightly exaggerated their importance as compared with other groups. Thus, the Reduviid bugs might claim equal attention to the Tabanid flies; but whereas the latter receive four pages, the Reduviids are dismissed in one short paragraph. However, it must be admitted that most of the medically important insects are indeed found among the diptera, and the book is well worth purchasing for the keys to this group alone. Dr. Jordan provides a welcome key to the important genera of fleas, with notes on many of them; and Mr. Whittick has added a useful section on Arachnids. The illustrations are admirable and the price, under present conditions, is extremely low.

### THE MALE SEX GLANDS

*The Sexual Glands of the Male.* By Oswald S. Lowsley, M.D., F.A.C.S. Oxford Medical Publications. (Pp. 746; illustrated, 55s.) London: Oxford University Press, 1943.

In this book the work of several contributors to the *Oxford Loose-Leaf Urology* has been assembled and reprinted to form a single volume. Dr. Lowsley, the well-known authority on the prostate, has dealt with the embryology, anatomy, pathology, and surgery of that organ. His description of the surgery of the malignant prostate includes the more recent method of treatment with oestrogen and castration, but he is of the opinion that this does not obviate the necessity for radical operation whenever this is possible. In such cases he recommends the perineal approach. Drs. Hinman and D. R. Smith are responsible for those sections of the book dealing with the testicle and epididymis, and Dr. Gutierrez for the articles on the vas and the seminal vesicles.

The work is profusely illustrated and the general lay-out is excellent. It is primarily a book for surgeons, and if any criticism is to be raised it is that the non-surgical treatment of genito-urinary lesions has been less adequately dealt with than the surgical. The treatment of infertility by hormone therapy and the treatment of impotence by psychotherapy are scarcely mentioned, and there can be no doubt that they are of considerably more importance than any surgical measures. There are few authorities on male sexual disabilities who would agree with the authors that pathological lesions of the genital tract are to be found in the majority of impotent men. But *The Sexual Glands of the Male* is a book written by surgeons for surgeons, and it is not surprising therefore that the medical and psychological aspects of these important subjects are not adequately dealt with.

### Notes on Books

A fourth edition has now appeared of Dr. W. WILSON INGRAM's useful book *The Diagnosis and Treatment of Diabetes* (Sydney and London: Angus and Robertson, Ltd.; 6s. 6d.). In revising his text the author has added new matter at various places, and in particular the chapter on the complications of diabetes; but, to keep the volume approximately the same size (150 pages), he has deleted the chapter on the estimation of glucose in blood. This is essentially a book for general practitioners, many of whom have already found it a helpful guide, with clear-cut directions, especially on diets.

A 14th edition of Mr. H. WIPPELL GADD's *Synopsis of the British Pharmacopoeia* has been published at 3s. 6d. by Baillière, Tindall and Cox. This edition comprises the six Addenda to the B.P. which have been issued since the main work was published in 1932. This additional matter will prove very useful to those seeking a brief summary of the changes contained in the official Addenda. The section on the Poisons Laws has been revised in accordance with latest Orders.

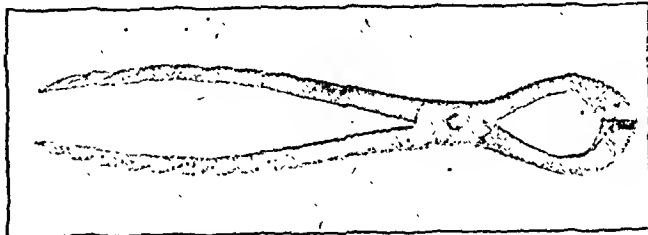
The *Calendar of the Royal College of Surgeons of England* for 1943 is published by Taylor and Francis Ltd., Red Lion Court, Fleet Street, at 2s. 6d. It has suffered a still further diminution in size owing to the shortage of paper, but all the essential official information is given and the Register of Fellows in alphabetical order appears in its accustomed place.

## Preparations and Appliances

### INSTRUMENT FOR MANIPULATION OF CENTRAL MIDDLE THIRD FRACTURES OF FACE

Mr. ARCHIBALD H. MCINDOE, F.R.C.S., F.A.C.S., writes from a Plastic Surgery and Jaw Injuries Centre:

Impacted central middle third facial fractures with retro-position of the alveolar segment require forcible disimpaction and advancement in order to obtain good dental occlusion. In carrying out this manipulation a strong grip of the alveolus is necessary, using an instrument which will do a minimum of damage to the buccal mucosa and none at all to the incisor



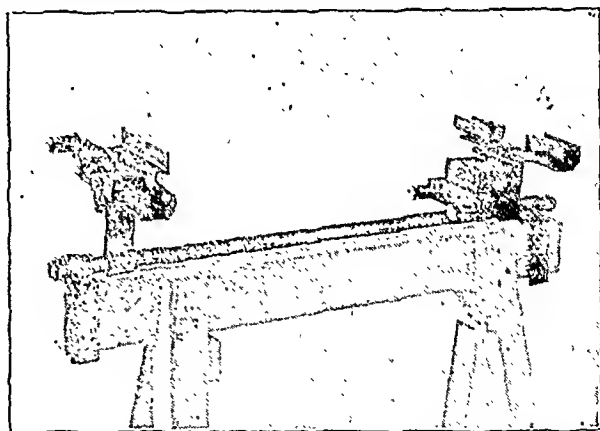
teeth. I have designed the forceps illustrated herewith for this purpose. The jaws are broad and strong and do not shut completely. Each is shaped to the area to be gripped and fitted with fine pin-teeth so that the alveolar bone above the incisor teeth can be firmly held but not crushed during the movement necessary for reduction. In practice they have proved most satisfactory for this purpose.

The forceps are manufactured by Messrs. Thackrays, Ltd

### RESUSCITATION BY ROCKING

Dr. W. F. CORFIELD, Medical Officer of Health for Colchester, writes:

You have recently published a number of suggestions for apparatus for rocking stretchers for Eve's method of resuscitation. In my opinion, none of them is as handy or complete as the apparatus suggested by Mr. A. V. Gooch, the Civil Defence Staff Officer for the casualty services of Colchester. This apparatus, as the illustration shows, consists of a bar which will fit on to a trestle, two chair backs, the edge of a table turned on to its side, or anything of this sort. Supported on the bar are two uprights, which will swing upon the bar when a civil defence stretcher has been placed in the slots upon them.



An important improvement of this apparatus is the addition of a block of hard wood hinged upon each upright with a channel fixed upon it into which the Army (Furley) stretcher can be fitted. This block can be tilted down out of the way when the C.D. stretcher is in use, or, if a Furley stretcher only is available, the block can be tilted up above the grooves of the C.D. stretcher and the channels on the blocks take the place of the grooves and receive the poles of the Furley stretcher. The apparatus is found to be most satisfactory with both types of stretcher.

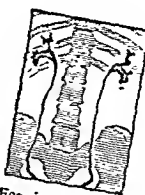
The advantages are that it is handy (weight 7 lb.), can be immediately brought into action, is cheap to make, the cost being about 15s., and the whole apparatus is easily kept upon a shelf without taking up much room.

# Shadows that speak

A clear-cut shadow on the X-ray plate is an asset of no mean value in diagnosis. Internal contrast agents of proved dependability, such as those listed, ensure consistently satisfactory results.



**BURROUGHS WELLCOME & CO.**  
(The Wellcome Foundation Ltd.)  
LONDON

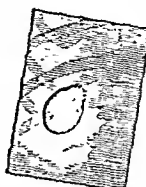


## DIODONE 'HYPOLOID'

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## BRITISH MEDICAL JOURNAL

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## THE PLACE OF CONSCIOUSNESS

As the artist stands back from his work from time to time and contemplates it before proceeding to a further stage in its completion, so in the field of scientific observation it is necessary to pause now and again to contemplate the facts of observation already accumulated, and to see what general ideas may be drawn from them. There is an intellectual refreshment in this contemplation, and in what may be called the escape from an exclusive preoccupation with the mass of detail into the realms of general thinking; but there is more in it than this, for it is an essential step in any ordered quest for fresh knowledge. In this mood Prof. Geoffrey Jefferson, in his address before the American Neurological Association on the nature of concussion, which appears at the opening pages of this week's *Journal*, has thoughtfully reviewed the field of clinical and pathological data at our disposal, and has formulated some general ideas therefrom. In doing so, not only has he given his readers the refreshment they have learned to expect from his writings, but he has provided a welcome example of the order of general thinking of which we stand in so great need in medicine to-day.

The phenomena of concussion have found their latest description and analysis in the experimental work of Denny-Brown and Ritchie Russell. They include loss of consciousness, alterations in the depth and frequency of respiration, in the pulse rate and the blood pressure, and also in certain lower-level somatic reflex reactions (laryngeal, pharyngeal, corneal, and of deglutition): a symptom-complex which corresponds to that found in man by clinical observation. Of the component elements, all but the first, as Jefferson points out, may now be confidently attributed to a paralytic effect on neurons, including especially those of the hypothalamus and brain-stem. Changes in the vascular supply of the cerebral hemispheres may now be regarded as epiphenomena of secondary import. From this point Jefferson is led to consider the factors underlying unconsciousness, and the relative roles in its mediation of suspended function in cerebral hemispheres and in the deeply seated cerebral nuclei. He concludes that traumatic stupor is the consequence of a negative or paralyzing lesion of hypothalamus and brain-stem; he cites the experimental evidence therefor, and gives three striking clinical case records of his own that point in this direction. The integrity of afferent pathways to the cerebral cortex is probably also impaired when unconsciousness supervenes on head injury, and the probable importance of these pathways has been stressed by Kleitman in his discussion on sleep and wakefulness.<sup>1</sup>

Jefferson then proceeds to consider the nature of unconsciousness, and prefers the term "parasomnia" as more accurately expressing the picture of deep and abnormal sleep presented by the unconsciousness of the concussed subject. Any student of the vast literature on consciousness, unconsciousness, and sleep must feel that in the forming of clear and accurate ideas on these states we are sadly handicapped by the limitations and pitfalls of linguistics, and by our inveterate human proneness to hypostatize abstractions. The word "consciousness" has only to be uttered, heard, or read, and we at once find ourselves irresistibly entertaining the notion of some elementary and unitary state. Too soon this becomes an "entity" which we seek to "localize" somewhere within the nervous system. On the other hand, the clinical or experimental observer who sees sleep or hypersomnia to follow a local lesion in the neighbourhood of the walls bounding the third ventricle proceeds easily to postulate there a "sleep centre," or, more logically, a "wakefulness centre," the destruction of which allows the subject to lapse into sleep or stupor. In this facile process of anatomizing an abstraction the hypothalamus has become the site of election for hypothetical centres for wakefulness or sleep, and the role of the cerebral cortex in these functions has been correspondingly minimized. In short, there is a naivety in much current thought on these subjects that must convey to the critical student a strong sense of its remoteness from reality. A feeling of this kind is evident in Prof. Jefferson's paper, and indeed it is clear that we must have some deeper thinking as to what precisely we are referring to when we speak of consciousness before we can form any useful ideas about unconsciousness.

Surely there may be more than one mode of consciousness, and this possibility implies that there may be more than one region of the brain, or more than one system of neurons, that functions consciously. May not those who "locate" conscious functioning in the cerebral cortex, and those who—more in the fashion, if not more correctly—would place it in the region of the hypothalamus, both have some measure of reason on their side; and, further, may not the modes of consciousness thus located differ in range and quality? These are questions that must find some answer before we can proceed to find a place in the nervous system for unconsciousness.

A most suggestive approach to these problems has been provided by Kleitman in his evolutionary idea of wakefulness and sleep—a hypothesis that has received too little attention from those engaged in the study and interpretation of concussion and its manifestations. Kleitman draws a distinction between "consciousness of choice" and "consciousness of necessity." The latter is the consciousness of the decorticate dog, which is a fugitive awareness of and response to internal changes and bodily needs—hunger, thirst, and the need to empty bladder or bowels. Of the outer environment there is no awareness, and to events in it no response. Once the internal needs have been dealt with, the animal lapses into sleep again. Consciousness of choice is that aspect of full consciousness of the intact organism which is related to the outer environment. This also is no simple state, but one constantly changing with the flux of environmental stimuli and

<sup>1</sup> *Sleep and Wakefulness*. University of Chicago Press, 1939.



modified by the movement of attention, so that, as Sherrington points out in his Gifford Lectures, "mind" may seem not to attach to a great proportion of the adapted responses to these stimuli.

Is it not possible that consciousness of choice is a cortical, and consciousness of necessity a subcortical, function? It is true that, so far as they go, Masserman's experiments on the hypothalamus seem to show that the hypothalamus is a purely effector organ and not one to which we can with any confidence attribute conscious functioning. There is much in the limited range and in the order of response to stimuli of the stuporous human subject that resembles the consciousness of necessity, but little trace of a consciousness of choice. With the emergence from stupor, elements of consciousness of choice are added progressively, and the range of environmental stimuli taken in and responded to increases. Perhaps the last elements to appear are those which subserve orientation in place and time, and with their return "consciousness" is again normal.

Kleitman traces the evolution from infancy to childhood of the normal diurnal sleep rhythm from the 4 to 5 hour rhythm characteristic of the newborn infant, and he believes this evolution to depend upon developing cortical activity. If it could be made under clinical conditions, it would be an interesting observation to see whether a comparable change from an infantile to an adult sleep rhythm occurs during the emergence from deep traumatic stupor to normal consciousness. If it proved so, it would support the notion of two components—cortical and subcortical—in the complex function we designate by the name of consciousness.

Jefferson concludes finally that the "focus" of unconsciousness is not located in the cerebral cortex but in the hypothalamic region, yet it may be questioned whether the available facts justify this conclusion. That a local lesion in this region is followed by unconsciousness does not rule out the possibility that an associated cutting off of afferent impulses to the cortex may play an essential

and not necessarily impulses from the hypothalamus, there is no anatomical evidence of the existence of a thalamo-cortical pathway, but, as Kleitman suggests, impulses from cranial proprioceptors. It seems highly likely, therefore, that there are yet undiscovered factors in the production of sleep, traumatic stupor, or unconsciousness from subcortical lesions or disorders of function, and the time has not come when we can lightly dismiss the cerebral cortex from an essential and dominant role in the mediation of what—with our simplifying tendencies—we are content to call consciousness—or a suspension of its functions from a correspondingly important role in unconsciousness.

## ANURIA

The association of renal disorder with conditions so varied in nature as pyloric stenosis, blackwater fever, incompatible transfusions, and "crush injuries" has raised the question of a common factor in pathogenesis. Foy and his co-workers<sup>1</sup> make it clear that dehydration is the most constant feature in these conditions. This might come from

excessive vomiting, disturbance of acid-base equilibrium, or diminution of blood volume. These factors, singly or in combination, would cause a decreased renal blood flow and impaired glomerular filtration, resulting in less urine. From this it seems that the oliguria and anuria are not due to blockage of the renal tubules with disintegration products of haemoglobin. The blockage, indeed, would appear to be the result and not the cause of anuria. This hypothesis is supported by the post-mortem findings<sup>2</sup> in a patient with pyloric stenosis who vomited greatly and had all the clinical manifestations of alkalosis, with tetany and uraemia. Lesions in the distal parts of the tubules were morphologically similar to those described in kidneys of patients dying from "crush injury," except for the absence of casts containing myohaemoglobin. This observation supports the view that neither anuria nor renal lesions depend on blockage of the tubules.

Bywaters and Dible<sup>3</sup> attribute the tubular damage to excessive concentration of the glomerular filtrate. Shaw Dunn and his colleagues,<sup>4</sup> on the other hand, lay stress on the reaction of the filtrate. The absence of myohaemoglobin in McLetchie's<sup>5</sup> case rules out this substance as a causal factor, though he rightly points out that some other substance as yet unrecognized may be the toxic agent. He suggests that tubular reabsorption must have strained the tubular epithelium and blood vessels owing to the general dehydration caused by the vomiting. With the small glomerular filtrate and the electrolyte abnormality caused by the dehydration and alkalosis wide differences in the osmotic pressures of filtrate and plasma would naturally exist, and damage of the thin membranes lining tubules and blood vessels might result. There is some evidence that chloride deficiency may itself lead to defective renal function. Perhaps more important is the defective blood supply to the tubules because of dehydration. The fact that the urine in McLetchie's case was acid in spite of the high degree of alkalosis shows how severe the dehydration was. Vomiting causes loss of fluid which contains sodium as well as chlorine, and the latter element is in excess in the gastric juice. To begin with, therefore, carbonic acid is retained in the plasma and tissue fluids to satisfy the demands of the sodium deprived of its chlorine partner. So an alkaline urine is excreted; but with the continued excretion of sodium there results too great a reduction in the osmolar concentration of the body fluids.<sup>5</sup> Since the osmotic pressure must be protected even more than the reaction, the sodium must be conserved, even though the alkalosis gets worse. The outcome is that the urine, reduced in its sodium content, has an excess of organic acid, giving a mild acid reaction. The tubular epithelium is therefore subjected to a double strain. In the lumen the pH is acid, whereas the reaction of the plasma circulating in the tubular capillary is more alkaline than normal. In addition, there is the excessive strain required to maintain osmotic equilibrium with a shortage of the two important ions—sodium and chlorine.

The important therapeutic question is the use of alkali in the treatment of anuria. When blockage is caused by substances, such as acetylsulphathiazole, which are more

<sup>1</sup> *Trans. roy. Soc. trop. Med. Hyg.*, 1943, 36, 197.

<sup>2</sup> *J. Path. Bact.*, 1943, 55, 17.

<sup>3</sup> *Ibid.*, 1942, 54, 111.

<sup>4</sup> *Lancet*, 1941, 2, 549.

<sup>5</sup> Morris, N., *ibid.*, 1943, 2, 91.

soluble in alkaline than in acid fluids, alkalis must clearly be given. In other cases, however, the important thing is to increase the depleted blood volume and the deficiency in electrolytes so as to ensure an ample supply of fluid that can be excreted. For this, nothing is better than a solution of sodium chloride with glucose, the former to replenish mineral content of plasma and the latter to promote diuresis. Only in the presence of a severe acidosis associated with chronic renal disease is alkali really necessary, and it is then best supplied in the form of lactate solution.

### PITUITARY CYTOLOGY AND FUNCTION

The pigeon has several advantages for the study of pituitary cytology and its relation to secretory function. First, the period of rapid bodily growth is almost completed before there is any development of the immature gonads, so that the periods of active secretion of growth hormones and gonadotrophin are separate. Again, the sex cycle of the pigeon is accurately known, and can be divided into a resting phase, pre-ovulation and ovulation phases in the female, an incubation period, and a feeding period. The absence of pregnancy and corpora lutea renders the cycle less complex than in higher vertebrates. Thirdly, in the pigeon the importance and function of prolactin are not matters of dispute, as they are in mammals: it may be mentioned here that the secretion of prolactin and of crop milk occurs in males as well as females, as the males share the tasks of feeding the young in the early stages after hatching. These factors have been stressed in their investigations by Schooley and Riddle.<sup>1</sup> Without entering into detailed descriptions of the cytological appearances of the cells from the pituitary glands which they examined from a large number of pigeons killed at various times during the growth and reproductive phases, we may summarize their main conclusions as follows. In the pigeon anterior pituitary, as in mammalian pituitaries, there are two types of chromophil cells which are apparently derived from a single type of chromophobe cell. Schooley and Riddle found that the acidophil cells differentiated during the later part of embryonic life, while the basophil cells matured only during the second month after hatching. This suggests that the acidophil cells are responsible for the secretion or secretions governing the growth processes, while the basophil cells secrete gonadotrophin, which is in keeping with the cytological evidence in other species. During the phase of crop stimulation and crop milk production there is evidence of secretion from the acidophil cells. Whenever functional states indicate a secretion of hormones the cytological condition of the pituitary cells is one of light granulation. Heavy granulation of the cells does not coincide with such functional states, nor are lands in which these cells predominate found to contain large amounts of the corresponding hormones when assayed by implantation. The finding that secretion of prolactin is associated with acidophil cell activity opens up some interesting speculations. Riddle and his colleagues have always been sceptical about the existence of a distinct and separate growth hormone. They have claimed that growth may be under the control of prolactin and/or thyrotrophin, and their investigations of various growth-hormone preparations have always shown them to contain at least small quantities of one or both of these hormones. The fact that crop glands are not stimulated during the initial phase of acidophil cell activity, when the body is growing rapidly,

is explained by the already known insensitivity of the immature crop gland to prolactin stimulation.

A more recent study of pituitary cytology in the pigeon by Koch<sup>2</sup> adds to the three types of cells discussed above a number of different cell types, without clarifying the physiological significance of the findings. The work may be criticized at the outset for the use of Bouin fixation, which is notoriously bad in the study of cytoplasm and its inclusions. The description of new cell types is a tempting hobby for the cytologist, but until such types are clearly related to physiological function they must remain of interest to cytologists alone. The multiplicity of cells described by Koch does not allow so clear a correlation with physiological function as do the descriptions of Riddle and Schooley. Koch's findings agree with those of Schooley in linking the basophil cells with gonadotrophin secretion, and also associate the acidophil cells with prolactin secretion, though here the authors differ on the cytological appearance of the cells during secretion. Koch describes two types of chromophobe cells, but does not pass any judgment on their significance or their relation to the other cells. From the figures given of the large chromophobe cells they may well be degranulated chromophil cells, since they are of the same order of size and show the same sort of vacuolated cytoplasm. The small cells called "kleinzellen" are regarded as effete cells which increase in number with the ageing of the pigeon. These are probably the same as the atrophied acidophil and basophil cells recorded by Schooley in adult females segregated for long periods after egg-laying.

### DISCIFORM DEGENERATION OF THE MACULA

In 1926 Junius and Kuhnt in a sumptuous monograph established as a clear-cut entity the condition they named disciform degeneration of the macula. By stressing the appearances seen at different stages of an affection that always ends with an atrophic disk-like area at the macula, they reduced a mass of purely descriptive designations to a clinical entity with an evolutionary course. They could only indicate but not define clearly the anatomical basis of the affection, but they succeeded in making superfluous such names as senile exudative macular retinitis, senile macular degeneration, pseudo-tumour of the macula, haemorrhagic macular retinitis, and many others. Histological studies on disciform degeneration of the macula have appeared with surprising frequency, and they all agree in showing connective-tissue proliferation in the deeper layers of the retina, disturbance of the pigment epithelium, thickening with or without ruptures in the elastic membrane, and transudates between the retina and choroid, sometimes quite massive. These findings are in the main confirmed by Holm,<sup>3</sup> whose histological study is the basis of a critical survey of the literature, which leads him to deny the validity of the conception of disciform degeneration as a distinct clinical entity. Holm's patient showed the not infrequent association of retinitis circinata, and histologically this proved to be due to subretinal fluid and not to intraretinal changes showing fatty and hyaline degeneration, as is commonly observed. He stresses that identical fundus pictures may have different anatomical backgrounds, and argues from this that the retina and choroid have a limited range of reactions to a variety of stimuli. This is no doubt true, but we doubt whether he should argue from this against the conception of disciform degeneration as a distinct entity, even though Holm can show that various

<sup>1</sup> Cold Spring Harbor Symposia Quant. Biol., 1937, 5, 165; Amer. J. Anat., 1938, 62, 313.

<sup>2</sup> Arch. Gyräk., 1941, 172, 1.

<sup>3</sup> Acta ophthal., Suppl. XIX, Copenhagen, 1942.



observers have wrongly regarded some cases as instances of disciform degeneration. It does not add to clear thinking to link the essentially "senile" condition of disciform degeneration of the macula with Coats's disease, which is essentially "juvenile" and not a clear pathological entity.

### ARTERIAL OXYGEN AFTER PULMONARY RESECTION

The lungs of a healthy person are said to contain ten times as much aerating tissue as is necessary for minimal requirements. Little, however, is known of the effects of pulmonary resection on the oxygen saturation of the blood, and it is important that this should be carefully studied in view of the numerous operations of lobectomy and pneumonectomy now being performed. Maier and Cournand<sup>1</sup> have made several hundred determinations of the arterial oxygen saturation after these operations, and their conclusions are of much importance. Blood was taken from the brachial artery for the estimations, which were not made when recent administrations of drugs or of oxygen might cause inaccuracy. Seventeen cases of pneumonectomy and 21 of lobectomy were studied.

In most of the pneumonectomy patients oxygen saturation was but little impaired, and, in fact, in those with a smooth clinical course it was normal within two or three days. In two cases prolonged oxygen unsaturation was observed. In the first this was associated with a large pleural effusion on the side of the operation, and restoration of the mediastinum to the mid-line by aspiration of fluid resulted in a rapid return of the arterial oxygen saturation to normal. The findings in the second case were most significant. The patient was a 62-year-old man with emphysema of both lungs who underwent left pneumonectomy for a carcinoma. The operation was well borne, but the arterial oxygen level continued to drop gradually during the next three weeks. Investigation of the pulmonary function showed that the residual air volume had reached the very high value of 70% of the total lung volume. This was due to overdistension of the remaining lung, which had ballooned over so much to the pneumonectomy side that ventilation was impaired. As soon as this was corrected by air refills on the operated side the oxygen saturation rapidly improved. This most interesting observation supports Lester and Cournand's<sup>2</sup> finding that pulmonary function after pneumonectomy was much better in those patients in whom marked compensatory emphysema did not occur.

The disturbance of oxygen saturation is greater and returns to normal more slowly after lobectomy than in uncomplicated pneumonectomy. Most cases show anoxic anoxaemia for a week at least, and when expansion of the remaining lobe is slow, or when there is compression from fluid, oxygenation is interfered with for longer. Retention of bronchial secretion and atelectasis may lead to severe anoxia. The remaining lobe appears to act as a shunt for some time, and even when it is aerating satisfactorily oxygen absorption from it is deficient. These findings are in conformity with ordinary clinical experience after lobectomy. Nevertheless, Maier and Cournand stress that clinical criteria of anoxia are unreliable, as is repeatedly shown by determinations of arterial oxygen. Dyspnoea and cyanosis are not accurate signs, for severe anoxia may exist in their absence. The importance of other signs and symptoms of oxygen lack, such as those seen at high altitudes (e.g., restlessness, mental confusion, and hallucinations), is often overlooked, and the authors suggest that,

instead of waiting for anoxia to develop, determinations of arterial saturation should be a routine after pulmonary resection so that the condition may be recognized in its earliest stages. In any case it is clear that, after both pneumonectomy and lobectomy, oxygen therapy is often desirable for much longer than is commonly thought. After pneumonectomy correction of mediastinal displacement to either side is important.

### OPIUM TRAFFIC IN THE FAR EAST

A recent written reply by the Secretary of State for the Colonies has reopened questions which occasioned fierce debates at the second Geneva Conference on Opium in 1925. It will be remembered that the American and Chinese delegations withdrew from the Conference mainly on the grounds that opium-smoking in the Far East had not been suppressed or restricted in the way prescribed by the Hague Opium Convention of 1912, and because the production of opium was not to be limited to what was required for medical and scientific purposes. The policy now announced on behalf of the British Government is the prohibition of opium-smoking in the British territories now in enemy occupation in the Far East and the abolition of opium monopolies therein when they are reoccupied, and also that the limitation of production of opium be considered. The principles for which the American delegates contended in 1925 were: "(1) That if the purposes of the Hague Opium Convention are to be achieved according to its spirit and true intent it must be recognized that the use of opium products for other than medicinal and scientific purposes is an abuse and not legitimate, and (2) that in order to prevent the use of these drugs it is necessary to exercise the control of the production of raw opium in such a manner that there will be no surplus available for non-medicinal and non-scientific purposes." The chief opposition to these principles came from India because of the opium purveyed by the Government for eating or for export trade. Moreover, income was derived from opium monopolies in the Malay States, Straits Settlements, and Borneo which the Crown Colonies were loath to surrender. M. Zahle, the able president of the Geneva Conference, in his final speech said: "No voice, I believe, can be raised against the justice of the principles enunciated by the American delegation"; and observed: "The producing countries realize that in total they are providing far more drugs than the world needs."

The world production of opium has been estimated at not less than 2,500 tons a year, while the world requirement for legitimate medical purposes is probably less than a tenth of that amount. The principle of limitation of opium production to medical and scientific purposes has been accepted by both the Advisory Committee of the League of Nations on Traffic in Opium and also by the Assembly of the League. The British delegates to the Hague Opium Conference of 1912 were instructed when attaching their signatures to it to add a declaration that the convention, if ratified by His Britannic Majesty's Government, shall apply to British India, Ceylon, the Straits Settlements, and Hong Kong in the same way as applied to the United Kingdom. In Great Britain the Dangerous Drugs Acts of 1920 and 1923 were introduced to give effect to the Opium Convention signed at The Hague on Jan. 23, 1912, and "to bring under control throughout the world the traffic in opium and cocaine and the preparations derived from them, and to restrict their use to medical and other legitimate purposes." It is to be hoped that the new declaration of policy may tend, if tardily, to achieve this beneficent object.

<sup>1</sup> *Surgery*, 1943, 13, 199.  
<sup>2</sup> *J. thorac. Surg.*, 1942, 11, 529.

## THE CHRONIC MEDICAL CASE IN THE ARMY

BY

J. W. TODD, M.D., M.R.C.P.

Major, R. A.M.C., Medical Specialist

## Types of Cases and their Treatment

Of 500 consecutive chronic cases which I recently saw in the out-patient department of a military hospital there were 146 with frank psychoneurosis, 95 in which the complaint was chiefly of dyspepsia, 60 with some kind of "rheumatism," and 101 with bronchitis. 40 men had neither apparent disease nor appreciable symptoms, and had mostly been referred because of the accidental discovery of some such benign phenomenon as a systolic murmur. Of the remaining 58 cases, 6 had migraine, 5 pulmonary tuberculosis, 4 asthma, 4 syncopal attacks, 4 epilepsy, 4 the sequelae of concussion, and 3 the sequelae of meningitis. There were not more than two examples of any other condition.

Of the 146 psychoneurotics, the main manifestation of 90 was the "effort syndrome." Of the 95 dyspeptics, 19 had radiologically demonstrated peptic ulcers, 17 of which were duodenal, one pyloric, and one jejunal following gastroenterostomy. Many of the radiologically normal cases had marked neurotic traits. Of the 60 cases of "rheumatism," the symptoms of the majority were wholly or partly psychogenic. The 101 bronchitides were the most "organic" group of all, and many of them had demonstrable chest disease. However, the conclusion that I often reached was that a man's chest was no worse than that of thousands of his fellows, and the real reason which had brought him to the out-patient department was his associated psychogenic symptoms.

Such cases as these are sometimes admitted to hospital for investigation and treatment, and they may remain for a long period. It is not uncommon to see men who have previously spent many months in one or more hospitals. Although hospital treatment may cause a temporary relief of symptoms, I have yet to hear of a single soldier with one of these chronic complaints whom it permanently benefited, except those with such conditions as peptic ulcer, for which they were discharged from the Service. If any actual medical condition is unimproved by a stay in hospital it can hardly be doubted that the psychological state is sometimes made worse by it. The men may become bored, depressed, and hypochondriacal, since they tend to think that as they are being kept in hospital they must be very ill. Their presence in a ward, too, would seem to have a bad effect on the more acute and recoverable cases there.

The conclusions from these considerations are, then, first, that the main trouble in many soldiers suffering from what are usually considered chronic medical complaints is psychiatric; and, secondly, that, whatever be the nature of their disease, they should rarely, if ever, be admitted to hospital, except in a few cases, merely to await discharge from the Service.

## Disability and Diagnosis

When a man's condition is being considered by specialists or medical boards it is the usual practice to expend much effort in deciding whether or not he has organic disease. If his symptoms are thought to be psychogenic a soldier is often reported as having "nothing the matter" or that "he only thinks he is ill." This attitude of minimizing the psychological condition is curious, for it seems obvious that among the qualities which are of quite supreme importance to the fighting man are the psychological ones. Of such qualities, those which are involved in a man's efficiency as a soldier may be roughly divided into three—his intelligence, his knowledge, and his character. The quality a deficiency in which will result in the greatest military disability is character, and most men with neurosis manifestly do have a gross character defect. If, on the other hand, organic disease is found to be present in a soldier he may be lowered in category or discharged from the Service even when his actual disability is slight. Among chronic medical cases the commonest examples of this are probably recovered pleural effusion, healed pulmonary tuberculosis, hyperpiesia, persistent albuminuria which is thought to be due to chronic nephritis, and the presence of a heart murmur deemed to be organic.

There should here be only one reason for lowering the category—that although the man in question has little disability now, he is likely to develop disability in the near future. In the conditions I have mentioned it would not as a matter of fact be probable—indeed, it would be quite unlikely—that such men would soon become disabled, and therefore they should not be put into a category lower than their actual disability warrants.

Another reason which is put forward against retaining such men is that, small as the chance of their breaking down may be, it is more likely to happen in the Army than it would be in civilian life. Even if this be true, when one considers that the Army is in being to fight a war in which thousands of its members will be killed or maimed this argument seems to show the lack of a sense of proportion.

Organic diagnosis thus seems commonly to occupy too prominent a place in the consideration of the chronic case, to the exclusion of disability, which is what really matters. The principle which should lie behind diagnosis is merely the decision whether progressive or severely recurrent diseases are present. If they are not, the subtleties and refinements of diagnosis can be forgotten. It follows that any investigation which does not help to make that decision is superfluous. A good example of such an investigation is the gastric analysis which merely provides an opportunity of labelling a man with an absurd diagnosis like "hyperchlorhydria." Many psychoneurotics undergo investigations directed to the stomach, heart, bladder, or other organ the function of which has been upset by the psychological disorder. In such cases it seems that the doctor has failed to look at the man as a whole but has concentrated his attention on some small part of the body.

Most chronic cases really need either no investigation at all or just one. A few need two and very few more than two. Provided that there is co-operation between the clinician and the radiologist and pathologist, it is possible to do all these with a maximum period of one night in hospital. I therefore suggest that no chronic medical case should be admitted to hospital for investigation. I previously concluded that virtually none should be admitted for treatment.

## Disposal

The soldier with a chronic complaint may be so obviously unsuitable for fighting that he is discharged or lowered in category, though the official reason for doing this is often the presence of some physical condition and not the psychological defect which is so frequently the main cause of his disability. Many of the bad cases are retained in the Army and given such unilitary duties as cleaning billets, emptying latrines, and picking up paper. When the question of actually discharging men for psychological disorder comes under consideration by a medical board, the members of the board often feel very strongly that it is unfair and unjust that they should be allowed to escape from the dangers and discomfort of a soldier's life. Although such men are usually quite useless to the Army, it does seem very wrong that they should be sent back to their homes with the halo of being poor invalids.

The actual assessment of the degree of military disability is not a medical problem at all. A soldier's officers are in a far better position to judge it than is, say, the medical specialist, who only has time to see him for 10 or 20 minutes in the middle of a busy afternoon. The officers constantly observe the man on exercises and see whether, for example, he can go over an assault course or march 30 miles or shoot to hit. The specialist, on the other hand, has to deduce from the man's condition what he thinks he ought to be able to do. This may at times bring him to quite wrong conclusions, and perhaps to say that a man is fit to carry out all the duties of an A.I. soldier when he has actually never succeeded in doing so. The following scheme would, I think, supply a better method for the classification of soldiers than does the present one.

After recruits have been in the Army long enough for those in charge of them to form a proper estimation of their capabilities, those who are in any way unsatisfactory should be put to various tests. For example, it might be determined how far they are able to march in full kit, in what time they are able to run, say, a mile, how accurate they are with a rifle and other weapons, and so on. As is already done, they should also, of course, be given an intelligence test. Every man unable to attain the top grade should be

seen by the M.O., who would supply a certificate stating whether or not he has a progressive or severely recurrent condition. If such conditions are suspected the man should be referred to the specialist. All men not so afflicted, whatever they happen to be suffering from, would then be graded into various lower categories, purely according to their abilities to function as soldiers.

If an officer later on considers that one of his men is unsuitable for his existing category he should again be put through these various tests and an appropriate form filled in. In this case there might be also added a statement as to the number of times he has been in hospital or excused duty during a specific period, whether he is offensive to others (as in enuresis and chronic bronchitis), and an estimation of his character, which the officer should be in an ideal position to judge.

Any man who functioned so badly that it appeared doubtful whether he could be of any value to the Army at all would be seen by a disposal authority. This body would decide whether or not there was any place in the Army which he could fill. If there were none, he would return to civil life. If, later, the needs of the Army were to change he could be recalled. This kind of procedure is already being adopted in the case of permanent Category C men under a recent A.C.I.

The only men who could not be dealt with by this machinery are those suffering from conditions which are rapidly progressive or recurrent. They would form the proper material for a medical board, since the assessment of their likely rate of progression or recurrence is a truly medical problem.

This scheme I have outlined would evidently mean a great saving in medical man-power. If it were in operation the physician would not spend his time in fruitless endeavour dealing with the chronic sick. He would instead be able to spend his days in what should be his proper function—caring for acutely ill men and returning them to their units as soon as possible as fit and fighting soldiers.

### Conclusions

Chronic medical cases should never be admitted to military hospitals for investigation and rarely for treatment.

The main disability of most chronic "medical" patients is psychological, whatever diagnosis is attached to them.

Psychological disorders cause more serious military disability than do most of the chronic organic diseases seen in soldiers.

A man should be put permanently into a lower category than his disability would warrant only if he has a rapidly progressive condition or a recurrent condition which is likely to be sometimes severe.

Disability should not be assessed by specialists or medical boards. All men, except those with progressive or severely recurrent conditions, should be classified by the results of tests designed to show how they function as soldiers.

I wish to thank Lieut.-Col. E. G. Holmes, R.A.M.C., Major J. H. Malloy, R.A.M.C., and Capt. F. H. Scadding, R.A.M.C., for many helpful suggestions.

All German men and women in certain age groups hitherto not employed on national service have been called on to report for duty (*Reichsgesundheitsblatt*, 1943, 21, 351). A large number of these persons, especially women, will thus be entering into a contract of service for the first time. The Labour Controller has issued the following order, which is based on the order of the Reich Health Leader: "The chief medical officer of the Labour Office in each State makes immediate contact with the competent medical chamber. If the necessity should arise, the competent medical chamber can undertake the examination of the medical reports if a local agreement to this effect has been arranged between the chief medical officer of the State Labour Office and the competent medical chamber. . . . It is absolutely essential that no error should occur in allocating women to work which might reduce their fertility. . . . The doctors primarily concerned with this problem are doctors who have placed themselves at the disposal of the centres for childlessness in marriage, the doctors in charge of State and municipal gynaecology and midwifery training centres, etc. Attention is drawn to the fact that even with the most careful investigation of legitimate complaints the present circumstances demand harshness in the employment of women. Also the earlier experiences of the RADWL [Young Women's Branch of the Labour Service] showed that permanent damage is hardly to be expected from amenorrhoea resulting from employment. It is therefore neither a reason for exemption nor an excuse for release from employment. . . . I am convinced that the German doctor also in this new sphere of employment will prove himself as hitherto a political protagonist who serves Fuehrer and people with a sense of responsibility and in this way helps to achieve total victory."

## A CLINIC IN THE BUSH

[FROM A CORRESPONDENT]

It all began from laundry baskets. Matron complained the baskets for clean and dirty linen, which the "mammies" carried on their heads, were too small and that too much time was wasted carrying the laundry backwards and forward. The markets and the shops of the capital yielded no baskets—or anything else of much use, for that matter—so it was necessary to find someone to make them.

Passing through a large bush village on one occasion, trying to buy eggs to relieve the monotony of beans and bacon or soya sli for breakfast, I asked a "boy" who could speak a little English there was anyone in the village who could make baskets. "Yes, mastah, my father he make fine fine baskets plenty." So I was taken into a compound, and, threading through narrow paths between huts, from which innumerable children ran out, past women and girls grinding the Koos in large wooden mortars with pestles nearly as big as themselves, I arrived at a very dark hut inside which a venerable but dirty-looking old man in a ragged shirt sat weaving a mat, with a selection of wives round about, from a buxom damsel of 17, well on the way towards her first-born, wizened women of 40 or 50, and children from babies in arms grown-up men like my guide.

The old gentleman spoke no English, but after "plenty palaver" he agreed to make enormous baskets at four shillings a time. Very fine baskets they were too, well worth the money and exactly what was wanted for the laundry. He made about four or five a fortnight and we wanted eighteen. In the middle of making them "I went for bush to buy a cow," so his wives informed me, and the transaction took him about three weeks. All in all, then, my dealings with the old gentleman lasted for a considerable time, but before long the purchase of baskets took a very minor place in my business in this village.

It was on one of my early visits to take delivery of the baskets that the son, my interpreter, drew my attention to his bandaged leg, and asked me for "white man's medicine," as with this he could not work. I confess that at my next visit I had forgotten all about his leg and had brought no remedies, but I silently reproached that the "great white master" had failed him in such that I could not forget again.

He had a typical tropical ulcer, which seemed to be based on yaws sore, for he had signs of previous yaws on his feet—fissures and punched-out scars. So the next time I brought a supply of succinyl sulphathiazole powder, a syringe, and a flask of sobil. His treatment was very satisfactory, but even when quite cured I did not return to work, though he often demanded a "paper" recommendation for a job. Actually he remained my faithful doctor and almoner at the clinic until I left the colony. On my next visit eight or ten adults and children with bad sores on their legs presented themselves. They were given "chucks" (injections) at their sores were bandaged up with powder.

The effect was magical—so much the treatment as the way the news spread. Soon what had begun as a benevolent gesture became a serious moral obligation not only for that village but for all the villages round, whose sick walked quite long distances to get treatment; what at first took three minutes soon became three and a half hours of really hard work. Every Saturday afternoon I spent the time with the villagers, until I was sweating and exhausted, and my medicaments, which had to be increased in quantity weekly, were finished.

One week when I was sick a colleague took my place, "just to see what it was like." He saw all right, but, like me, felt that he could not go back on this self-imposed task, and at the end of my stay in the colony we both went and worked all out for the whole of the afternoon. There is no doubt that the villagers were grateful, and sometimes they tried to express their thanks, and although their efforts were clumsy they were none the less sincere. Our missionary zeal, however, was not without ulterior motive, for we let it be understood that "susikilo" (eggs) and other produce were not unacceptable. For six months we never lacked an egg, sometimes two, for breakfast, and had enough over to give some to our friends. An occasional chicken, in season mangoes, oranges, and pawpaws, more than we could eat, made a lot of difference to the meagre and monotonous diet provided by the supply authorities, who had not the graft of medical skill enjoyed by us.

### Crowded "Out-patients"

Our "consulting room" was primitive in the extreme. At first we held our sessions outside a hut, with no table or chair, partially protected from sun and later from rain by the edge of the thatched roof, with literally dozens if not hundreds of men, women, and children crowding round, laughing, talking, gesticulating, so that it was well-nigh impossible to hear oneself speak or to move one's arms. As the numbers grew and the rains came on in earnest the

arrangement became impossible; we had to be protected from both our patients and the weather. We brought a table and a couple of chairs and were allowed the use of a slightly larger and more stable hut, *pro bono publico*. Here we sat in a dark and stuffy inner room while half a dozen stout bodyguards held the seething multitude at bay. They were fairly successful with the men, but with the women and children, who were kept waiting until the men had been attended to, all bounds were soon broken, and we were almost submerged by a mass of solid, black, but clean flesh, even though they were covered with yaws ulcers.

The domestic habits of these people are filthy in the extreme, but in their persons they are far cleaner than those whom one is accustomed to see in a hospital out-patient department at home. This cleanliness was what really made the clinic possible, and accounted for the absence of calamities from our very unorthodox treatment. Lately we were giving 150 to 200 intramuscular injections every session; there was no time for asepsis, and the only cleaning a needle got was passage through the skin of the next patient; yet we never had an abscess or even a septic pimple. This cleanliness was not due either to an absence of clothing, for it was wonderful how many layers of cloth were unwound, especially from the women, even in that tropical climate. They always wanted to appear pregnant, as that was their most honourable condition, and if they were not they bunched up the innumerable layers of cloth in which they were wrapped in order to add verisimilitude to an otherwise unconvincing shape. Modesty was curious; after the first moment of confusion the grown-up women and older girls showed none, though the little girls from about 5 to 10 were much more diffident. The men were very shy, especially if they thought that their women were looking at them over the fence, while some of the old men were as coy as any delicately nurtured English maiden.

Our teachers of medicine would have been horrified at our rough-and-ready methods, and the traditional sixpenny practice with hands up for cough or belly-ache would almost appear scientific in contrast. Still, on the whole it worked, and anyway it was the only form of treatment these people had a chance to get. It certainly taught us about the diseases indigenous in that part of the Tropics in a way which no set lectures and demonstrations in an organized course could have done.

### Prevalence of Yaws

By far the commonest disease we were called upon to treat was yaws. It must affect nearly 100% of the children. Generally it was in the secondary stage, with the characteristic ulcers with heaped-up edges, which, with secondary infection, often spread widely and deeply as tropical ulcers. These yaws are chiefly on the feet and legs, but also on the extensor surfaces of the elbows, and, especially in women and children, over the sacrum and buttocks and in the anal folds. It was quite remarkable how these yielded to half a dozen weekly injections of 1 c.cm. of sobita. Of course it was impossible to do Kahn tests and we probably did not cure the disease, but at least we removed the symptoms for a time. Sometimes the sores were so thick all over the body that there was scarcely room to make the injection, but even these melted away under the influence of the sobita, and the tropical ulcers, once the secondary infection was checked by the succinyl sulphathiazole powder, closed up with astonishing rapidity in many cases. In fact this became a therapeutic test of the nature of the ulcer. In nursing mothers a severe mastitis was often seen, which cleared up equally satisfactorily with sobita.

Other manifestations of yaws were swollen, intensely painful joints, periarticular nodes, and in older people the aching pains in the shafts of the bones and headache, which was a marked symptom. These pains were generally easily diagnosed by the concomitance of sores on feet, and the patients always expressed themselves better as the result of the sobita.

Fibrositis existed, but was not often seen, except where there was a clear history of severe strain or other trauma. Gonorrhoeal arthritis was not very uncommon, but arthritis of the rheumatoid or osteo-arthritic variety was very rare, although it did occur. The halangeal deformities of very late yaws were not dissimilar to a chronic rheumatoid hand. Acute rheumatic infection was supposed to be non-existent, but two young women with undoubted mitral stenosis were picked up in another clinic.

The most interesting disease was trypanosomiasis, which was not supposed to exist in that part of the colony. Although not common, there was seldom a week when we did not discover one or more children or young adults with dull, mask-like, almost Parkinsonian features, functional ptosis, and enlarged glands, especially in the posterior cervical triangle, complaining of headache, lassitude, and fever, and sometimes of sleepiness, though this latter a late symptom as a rule. We tried to get them to come up for blood puncture and confirmation to the hospital, where the subsequent antitrypal and tryparsamide medication could be given intravenously, as we did not dare to give intravenous injections under

the septic conditions of our clinic. One of the most interesting cases was that of a small boy who had all the appearances and behaviour of a low-grade imbecile, but who also had trypanosomiasis. Under treatment he developed in a most remarkable way, and, although probably still backward, was raised far above the imbecile class. It was impossible to test the degree of deficiency with no basis of common speech, for we had Mandingos, Jollofs, and a few Fullahs, all speaking quite different languages.

### Incidence of Other Diseases

Skin diseases were common—scabies, tinea, and some conditions which defeated our powers (admittedly limited) of dermatological diagnosis. Leprosy was rare, but we did see one or two cases. Elephantiasis was also rare, but a few cases turned up, often confined to one foot or leg and not often in the scrotum. Oedema was not uncommon, mostly of hepatic origin; malaria, amoebiasis, and other tropical maladies did not give the liver much chance of remaining healthy. Dysentery was for the most part mild, and as sodium sulphate was equally efficacious for this and for constipation our therapeutic resources, necessarily very limited, were in this respect economized.

A large proportion of children between 2 and 12 had enlarged malarial spleens, but after this age splenomegaly tended to disappear and malarial attacks, though they did occur, passed almost unnoticed, they were so mild. It was interesting to note that the almost universal pot-belly in the young children was scarcely ever due to an enlarged spleen, as we at first suspected, for the spleens were not large enough to cause so much distension. Umbilical hernia was very common, probably due to the crude methods of separating the cord, and consequently the abdominal muscles were at first very lax, until head-carrying of weights, begun at a very early age, strengthened all the muscles of the trunk; in children who were breast-fed for two or three years some of the distension was just plain fat.

Chest conditions were often seen: a few cases of tuberculosis, which went downhill very fast; many cases of not very severe bronchitis; and a few patients with pneumonia, most of whom recovered quickly, generally walking about on the fourth or fifth day and sometimes not lying up at all. Heart disease was represented by a few congenital abnormalities and one or two final breakdowns, but except for the two cases of mitral stenosis already mentioned and an occasional aortic incompetence, presumably syphilitic, there was none of the wealth of clinical material so often met with in out-patient departments at home.

Organic nervous disease was practically non-existent, because there is little nervous syphilis and yaws does not attack the nervous system, but we had one pathetic old gentleman with paralysis agitans, who was convinced that an injection of sobita would cure him at once. Mental disease was represented by very occasional cases of schizophrenia. Juju hysteria is not met with to any extent in the colony. Venereal diseases were not very common in the villages and were chiefly gonorrhoea and lymphogranuloma; the glands in the latter disease sometimes blocked the lymphatics, causing unilateral oedema; these cases we referred to a V.D. clinic which we held in another village. Syphilis was difficult to diagnose. This is not the place to discuss whether yaws is really syphilis or syphilis yaws, but syphilitic lesions such as we are accustomed to at home were not met with to any extent. Gonorrhoeal (?) ophthalmia was not uncommonly seen. It was so severe in some cases as to make treatment appear useless, but 10% protargol seemed to help even these apparently hopeless people so much that from being quite blind they were obviously able to see. It must be remembered that they do not read or do any fine work, so even a small degree of vision was reasonably adequate. The same treatment was successful in trachoma, which is often found here, although it is very mild, with remarkably little disabling effect.

Otitis media was rare in spite of the prevalence of upper respiratory catarrh, and we saw no mastoiditis or other severe aural complications. Septic teeth and tonsils were not often seen, but when they did occur, or rather when the people were led to complain about them, they were bad, and some of the dental abscesses were appalling.

This bush clinic was really a commonplace out-patient department, with the common and interesting diseases characteristic of a tropical instead of a temperate climate; but it was instructive, as all such out-patient departments must be. Our diagnosis and treatment were severely limited by the total absence of modern facilities and ancillary services, but on the other hand perhaps it was good for us to realize that clinical medicine could still do something without them. The chief lesson to learn, however, was that from the humanitarian point of view we have a duty as a profession to bring some relief and healing to these simple, kindly, and trustful people. From the scientific point of view, what a wealth of untapped material at all stages of disease is to be found ready to our hands, especially if we go out to the people, instead of sitting still and waiting for the people to come to us, often when they are beyond relief.

## Correspondence

### The Changing Character of War Wounds

SIR,—A recent tendency has been noticeable on the part of those recording experiences of war wounds to ignore a factor which would appear to influence results of treatment, and may, unless due consideration is given to past wars in the light of the present one, easily be overlooked. The more favourable results of the treatment of wounds in this war when compared with those of 1914-18 are generally ascribed to such factors as earlier excision, the sulphonamides and now penicillin, tetanus toxoid, early plaster fixation, special mobile surgical teams, etc. All of these are obviously highly contributory, but there are still others which may be operative. Among these the environment in which wounding occurs is no doubt important, and we should not lose sight of the character of the wounds themselves. For the most part the present war wounds are found to be singularly free from pieces of uniform, underclothing, webbing and leather equipment, badges, and the like, which were so frequently seen in the last war and were such a heavy source of contamination. Inquiry into the reason for this difference in the character of the wounds at once suggests that this is due to the difference in nature of the explosives and the missiles used.

When Lord Nelson was mortally wounded by a musket ball which, striking his left epaulette from above, fractured the spine, traversed the spinal canal, and lodged in the muscles of the back, the ball carried in with it "a portion of the gold lace and pad of the epaulette, together with a small piece of his lordship's coat" (Richard Clarke's *Life of Nelson*, London, 1813). These materials were found firmly attached to the ball as it lay embedded in the muscles. From Trafalgar until the 1880's there was little fundamental change in small-arm ballistics, but about that time high-velocity rifles were first used. These burned "smokeless" powder and fired small and hard projectiles at high velocity which tended to cut through, rather than punch out and carry pieces of clothing or other covering material along with them. With their use and later still high-explosive shells, deep contamination by clothing or other materials traversed by missiles took place less often, but nevertheless did not disappear entirely, as was amply shown during the years 1914-18. The projectiles used in the present war, however, are remarkable for the still higher velocities imparted to them—velocities which have never hitherto been attained and are probably in some cases of the order of 8,000 or more feet per second. At the same time the materials of which these missiles are composed are for the most part relatively light as compared with lead. The result is that many war wounds to-day are caused by small fragments of relatively light material travelling at an extremely high velocity. These cut cleanly through whatever coverings they meet, and in doing so undergo rapid change in momentum so that they relatively soon come to rest. Their wound of entry may be difficult to find, and as they are very hot they are relatively sterile and often do little damage.

I suggest, therefore, that in any comparison of the results of treatment of the casualties of this war with those of the last the changed character of the wounds caused by modern projectiles should be given due consideration.—I am, etc.,

Bristol.

LAMBERT ROGERS.

### Thymectomy for Myasthenia Gravis

SIR,—The report by Dr. Maurice Nellen on a single example of thymectomy for myasthenia gravis (Dec. 18, p. 778) is of much interest as additional evidence that remission of symptoms may follow the operation. It may be questioned, however, whether it is really wise to publish isolated instances of treatment in a disease where so many unknown and doubtful factors are concerned as are found in the clinical complex known as myasthenia gravis. It is certainly unwise, I think, to conclude, as Dr. Nellen has done, that there is enough evidence now "to warrant a thymectomy in every case of myasthenia gravis." In collaboration with Dr. James Carson I have, since Feb., 1942, performed the operation of total thymectomy twenty-five

times, and a brief report of the first twelve was given at meeting of the Neurological Section of the Royal Society of Medicine in Nov., 1942. This comparatively large series of operations will, we hope, ultimately form the basis for a detailed account of the surgery of the thymus gland and its relation to myasthenia gravis. The results, however, are variable, so that it would be equally misleading to publish a single failure or a single success. We feel that we are treading on uncertain ground, and although we are encouraged to proceed cautiously with careful choice of subjects, we far from subscribing to Dr. Nellen's conclusion that thymectomy should be done for every patient with myasthenia gravis.—I am, etc.,

London, W.1.

GEOFFREY KEYNES.

### The Abduction Splint

SIR,—No doubt Mr. Souttar in his most interesting Bulletin lecture "Physics and the Surgeon" expected some criticism of his remark about the "so-called abduction splint." One cannot resist parrying his slight sword-thrust, for it is obviously misdirected. The primary purpose of the abduction splint—used, for example, in the treatment of tuberculous hip—is not to produce abduction but is to control the hip and to give immobilization. This immobilization and control involves careful attention to both lower extremities and to the pelvis, and the splint does in fact maintain the hip-joint in whatever position the orthopaedic surgeon determines to be best for the particular joint in question. The abduction splint and the patient form one complete mechanical system, and counter-traction being arranged with scrupulous accuracy for the purpose mentioned.

Mr. Souttar need not lower his voice when addressing orthopaedic surgeons: we welcome criticism.—I am, etc.,

Exeter.

NORMAN CAPENER.

### Cerebral Herniae and Surgical Decompressions

SIR,—Your reviewer of the handbook of surgery by Handfield-Jones and Porritt (Dec. 18, p. 781) disagrees with the suggestion that the term cerebral hernia should not be used for surgically made decompressions. These decompressions properly made are under cover of functioning muscle with conserved nerve supply, and are thus under a very good measure of control and differ from an unrestrained brain protrusion covered only by skin or granulation layer.

There is an essential difference here, and to call one a decompression and the other a hernia is worth while. The maker of a good decompression is saved from the stigma of being the creator of a real hernia, which is, or rather was, an indication of slovenly technique.—I am, etc.,

London, W.1.

A. DICKSON WRIGHT.

### Omens of Influenza

SIR,—Commenting on your leading article on influenza (Dec. 4, p. 717), where you say, "the phenomena which determine epidemic influenza are still largely unknown," Dr. A. Garvie suggests that epidemics may often follow outbreaks of common colds (Dec. 18, p. 793).

May I suggest that a more useful alternative would be to attempt to predict epidemics by some combination of the two main theories: the seasonal (i.e., meteorological) and the intrinsic cyclical one of Brownlee in its two-phase modification (Webster, *Edinb. med. J.*, 1939, 46, 591). Thus the last peak over 300 was in the week ending Feb. 15, 1941. Should the present peak have been reached at 1,148 (week ending Dec. 11) the interval is  $4\frac{1}{2}$  periods of 33 weeks; the half-period being 15 weeks, as often is the case in both influenza and cancer.

It is also of interest that the present epidemic is seven years (to a month) from the 1937 January peak, and 11 years from the 1933 epidemic. Influenza here seems to show a similar "long-period" to that discussed recently by me in cancer (Dec. 4, p. 720).

Swine influenza breaks out in such widespread areas of the United States simultaneously that only a meteorological "trigger" can be suggested as an essential causal factor. A similar correlation in human influenza is suggested by study of the meteorological phases at large epidemics, as in the marked "polar front" shown in chart form by Sir Napier Shaw



in his *Drama of Weather* (1933, Fig. 72, p. 196) for Feb., 1929. Epidemics are more likely to occur when such a meteorological environment, with its associated biochemical reactions, and other lowered resistance factors coincide with one of the periods (or half-periods) on the cyclical theory of Brownlee-Webster. The present epidemic in its time of arrival supports such a viewpoint.—I am, etc.,

London, W.1.

J. H. DOUGLAS WEBSTER.

### Secondary Organisms in the Lungs in Influenza

SIR.—Your leading article on staphylococcal pneumonia (Dec. 18, p. 783) is evidence of a renewed interest in the secondary invaders of the lungs in influenza, and especially in the very dangerous *Staphylococcus aureus*, which one or two of us found in 1918-19. You quote from a short paper of mine in the *Lancet*, but this was a preliminary note on what we were then finding in Malta. I really write this to say that a somewhat fuller account, with records of a larger number of cases, was published in the *Journal of the Royal Army Medical Corps* for Feb., 1923. One striking comparison showed that while *Staph. aureus* was present in the sputum in 27% of 187 cases of bronchopneumonia, it was found in 83% of 30 fatal cases. Perhaps I might quote from the conclusions of this paper:

"The results obtained give no clue to the nature of the primary infection, but they show to what an extent this primary infection reduces the resistance of the tissues to the attack of the secondary invaders. The occurrence of *Staph. aureus* in a large proportion of fatal cases [in Malta] has not, I think, been recorded as a feature of the epidemic in other places. . . . It is evident from the numerous published accounts that the secondary organisms found in the lungs vary in different localities, and difference in case death rates may be due to difference in the secondary invaders."

—I am, etc.,

Dundee

ADAM PATRICK.

brother, aged 11, went down with fever, vomiting, and very marked jaundice. This last boy had had no prodromal symptoms whatever, though he had the worst attack of the three.

Altogether I saw eleven cases of epidemic hepatitis in the next four months, mainly in the first six weeks, though I knew of others. For example, I attended a girl aged 9 during the acute phase of a moderately severe attack from April 20 to 26. On the last date her twin sister, who slept with her, showed no symptoms or signs of disease, but on May 22 she developed so mild an attack that I was not called to see her. The worst case was of a woman aged 29 who developed the jaundice on Feb. 24 after her child aged 4 had had it on Feb. 1. I saw one child of 10 on Feb. 16: she had epistaxis on Feb. 20 and 22, and jaundice developed on Feb. 22. Her younger sister, aged 8, showed both reflexes mildly on Feb. 22, but they were not present 10 days later, and she had had no gastric symptoms. Their small brother, aged 5, on Feb. 22 showed a reflex over the appendicular region, but this seemed completely gone a few days later.

Thus this small epidemic suggests that this combined appendicular and left paramedian reflex has definite diagnostic value in that it enabled me to forecast the appearance of an epidemic before any cases of actual jaundice had been seen, that several times cases were correctly diagnosed before jaundice developed, while in the few cases in which the reflex passed off without actual jaundice or even symptoms there was a strong probability that they were actually mild or symptomless infections. If further investigation should confirm the general validity of these observations, it would give us much-needed help in discovering causes and elucidating the disease. I would, however, repeat what I said in my first letter—that when dealing with children gentleness and tact are needed if the results are to be reliable.—I am, etc.

Winstford, Cheshire.

W. N. LEAK.

### A Diagnostic Sign in Catarrhal Jaundice

SIR.—In connexion with your leading article of Nov. 27 (p. 680) on epidemic hepatitis and the interest being shown in the subject, there are, as you say, many unsolved problems. One great help in solving these would be some clinical means of distinguishing this type of hepatitis from ordinary catarrhal jaundice before the occurrence of many cases makes the diagnosis plain, and also, if possible, some way of recognizing mild and abortive cases. So far serological tests have not been helpful and they always take time. I think there is definite diagnostic value in two points which I have not seen mentioned in the literature, but which have been observed in most of my patients, as also in those of my partner, Dr. Mary MacLaren. The first is the type of vomiting. This comes on suddenly, very frequently at night, and with so little warning that the gastric contents are frequently vomited on to the bedclothes, even in adult cases. This suggests that it is central rather than gastric in origin, and it usually occurs a few days before the jaundice. The latter, as has been noted, often affects the skin before the conjunctivae, and in an early or mild case it shows best on the nape of the neck; in fact the neck looks at first as if it had not been washed, and the jaundice may spread no further. This is, I think, very typical.

A sign which is more definite than these two symptoms is the curious Ligat's reflex to which I drew attention in a letter in the *Journal* in 1938 (Sept. 24, p. 683). Briefly the sign is the presence of Ligat's reflex (hyperaesthesia to light pinching of the skin) in the appendix area and also in a definite narrow line about the position of a paramedian incision, to the left of the midline and commencing at the level of the umbilicus. A small epidemic here this year enabled me to test its diagnostic value. I was called on Jan. 8 to see a boy aged 6 for an attack of sickness. On examination I found Ligat's reflex very active over the appendix and also in the paramedian line I have described. I told his mother that the lad would develop jaundice—of which he then showed no trace, nor did I know of any cases in the district—and that probably his two elder brothers would do the same. He duly developed jaundice on Jan. 11, and had a moderately mild attack. On Jan. 19 one brother, aged 9, had an attack of vomiting, and both Ligat's reflexes were present, but by Jan. 26 the sickness had ceased, though the reflexes were still active. On Jan. 31 his elder

### Treatment of Sciatica

SIR.—In the article on pain in the distribution of the sciatic nerve (Dec. 18, p. 773) there is no mention of the French method of treatment. This was published some two or three years after the last war: I think in the *Praticien*. The description was to the effect that if a patient with sciatica lies on his back, well relaxed, with the knees bent over a large firm pillow and presses firmly on a vertical bedboard with the ball of the foot of the affected side, the pain will very likely disappear. The ankle should be dorsiflexed. This method is most efficient, and, as in so many cases of nerve pain, once a few seconds of physiological as distinct from drug relief is obtained the result tends to be permanent. Presumably the explanation lies in the antagonistic innervation (Golla) relaxing the hamstring and leg muscles and so resting the nerve. This explanation was not given in the description.

Contrary to the quoted statement, I remember seeing some three much-inflamed sciatic nerves exposed to view by my late chief, Sir D'Arcy Power.—I am, etc.,

London, W.1.

G. H. COLT.

### Diagnosis of Spontaneous Hypoglycaemia

SIR.—I agree with Dr. R. D. Lawrence (Dec. 11, p. 760) in his view that the diagnosis of spontaneous hypoglycaemia is becoming too popular and overdone as an explanation for minor indispositions. The disease hyperinsulinism is, of course, the clinical opposite of diabetes mellitus, and frequently is curable, if not by dietary adjustments by surgical intervention. But episodes of hypoglycaemia do not necessarily mean excessive insulin. Just as hyperglycaemia is merely a symptom, so hypoglycaemia is a symptom which is encountered in a number of abnormal states other than those of pancreatic origin. The least common of these are gross disorders of the liver (hepatic atrophy provoked by poisoning and causing hypoglycaemia as a terminal event), diseases of the muscles such as progressive muscular atrophy and muscular dystrophy, and abnormalities of other glands of internal secretion such as hypofunction of the adrenal cortex in Addison's disease, hypothyroidism, and insufficient function of the anterior lobe of the pituitary gland (chromophobe tumours). Rather more common is the symptomatic hypoglycaemia occurring not infrequently as a presenting feature in the various psycho-

neuroses. This is sometimes referred to as the nervous type of hypoglycaemia, and is easily diagnosed, for the patient, besides being emotionally unstable and complaining of hunger and weakness before meals, also has other symptoms, not uncommonly those of an anxiety state. The treatment, of course, is simple reassurance and encouragement together with carbohydrate food to overcome the hunger and weakness. Another real syndrome is effort hypoglycaemia, which may arise after strenuous physical exertion. Athletes compensate for this before competitive sports by eating lump sugar.

The term hyperinsulinism should be reserved for those cases of hypoglycaemia in which an adenoma or carcinoma of the islet cells is present or for those few cases in which there is primary overactivity of non-neoplastic insular tissue.

The criteria for the diagnosis of spontaneous hypoglycaemia may be enumerated as follows: (1) a post-absorptive blood sugar (b.s.) value of less than 0.060 g. per 100 c.cm.; (2) intolerance of going long periods without food; (3) symptomatic attacks of hypoglycaemia occurring when the patient is fasting; and (4) relief of such attacks by the administration of sugar. A useful diagnostic point is the previous health of the patient. In all cases of neoplasms of the pancreas the patient enjoys normal health prior to the first hypoglycaemic attack, which usually occurs no more than a few months before the patient seeks medical advice, and subsequent attacks follow with increasing frequency. This course is not seen in the hypoglycaemia of psychoneurotics, and a b.s. in the morning after a night's fast is invariably greater than 0.070 g. per 100 c.cm., whereas in cases of true hyperinsulinism the post-absorptive b.s. value is always less than 0.060 g. per 100 c.cm. Also psychoneurotics who present with hypoglycaemia stand up well to fasting.

All patients who are suspected of true hyperinsulinism should be subjected to the "fast test," which comprises the withholding of all food for about 36 hours with the patient under supervision, preferably in hospital, and when symptoms appear a b.s. is taken and sugar administered to restore the patient's well-being. Such a test reveals all cases of true hyperinsulinism, and very low b.s. values are obtained. Psychoneurotics tolerate the test quite well, and the level of the b.s. is generally as high at the end of the 36-hour period as it was at the beginning. In hyperinsulinism, of course, the development of symptoms necessitates termination of the test many hours before the scheduled period, and the b.s. then is less than 0.050 g. per 100 c.cm.

The mere fact that symptoms are relieved by giving sugar should be interpreted with extreme caution. The level of the b.s. should be ascertained at the exact time symptoms are present, and only with this precaution can the inference be made that any symptom is at all related to the level of the b.s.

Though the medical profession is to-day more than ever "hypoglycaemic-conscious," it is as well to bear in mind some of the more common disorders with which spontaneous hypoglycaemia may be confused: peptic ulcer and functional dyspepsia (spells of fatigue plus hunger relieved by food); attacks of unconsciousness from any cause with or without convulsions; epilepsy itself; intoxication from alcohol; psychotic conditions; the psychoneuroses (hysteria and anxiety states chiefly); confusional states; and all organic diseases in which mental or nervous abnormalities occur.—I am, etc.,

GEORGE R. W. N. LUNTZ,  
Medical Officer, Guy's Unit, E.M.S. Hospital.

### Diet and Peptic Ulcer

SIR.—In his letter to the *Journal* of Dec. 4 (p. 725) Sir Arthur Hurst makes a statement which, because it is based on a life-time study of alimentary disorders and a wealth of clinical experience, lays it all the more open to timely criticism. He shows no sympathy for Dr. Wrathall Rowe's assertion (Nov. 13, p. 619) that meat leads to a far more abundant secretion of HCl in his (Dr. Rowe's) stomach than cheese, and goes on to state, "If it is subjective, and not the result of comparative test-meals, it is valueless"! I, on the contrary, as a fellow-sufferer can both appreciate and sympathize with Dr. Rowe's assertion.

I can well believe that acutely painful experience tells Dr. Rowe when he is secreting abundant HCl, and that he has no need to resort to comparative test-meals for confirma-

tion. Would Sir Arthur have us believe that the secretion of HCl quantitatively, as influenced by the ingestion of different kinds of food, cannot be recognized subjectively by the medical man who, in addition to his clinical training, is also a victim of confirmed peptic ulceration? I hope not.

It is interesting to note that among his patients Sir Arthur has had several doctors who "for years had taken alkalis and belladonna for acidity, till a test-meal showed that they really had achlorhydria." I can only conclude that these doctors never had occasion to resort to vomiting in an effort to relieve their pain. Had they done so they would soon have known whether or not they were suffering from acidity. Would it not be more accurate to say, "Numerous investigations have shown that anything less than 1/100 gr. (hyoscyamine or atropine) has no demonstrable action on the secretory or motor activity of the stomach"?

Sir Arthur Hurst's impersonal, coldly scientific approach to the whole subject is mildly resented by both my hyperchlorhydric stomach and my duodenal ulcer.—I am, etc.,

E. MAURICE WEBSTER.

### Therapeutic Fallacies

SIR,—None of the correspondents taking part in the discussion seems to have sufficiently acknowledged the main issue of the article by Linnell and Thomson. Their criticisms are on minor points, and even there the views of the authors appear to be misrepresented in many instances.

In my opinion the paper is a very courageous attempt to apply to the question of medical treatment the same strict rules as to medical diagnosis. Treatment must be built on scientific principles, developed logically, and proved experimentally; if there are forms of treatment instituted by tradition and habit only, they have to be carefully examined and sifted by the scientific method. Should they "be proved to be valueless they should be discarded" (Linnell and Thomson). Now the Vienna medical school (when such a school still existed) had men with ideas very similar to those propounded by the authors. I cannot help quoting two important witnesses for this statement.

Prof. M. Neuburger, the last medico-historian of the school, writes in his book *British Medicine and the Vienna School* (Heinemann, London, 1943, p. 55): "The therapeutic scepticism of Skoda: The high standard which was reached in physical diagnosis enabled Skoda to follow the course of diseases independently of the subjective symptoms, and he used this . . . to throw light on the value of methods of treatment used by his contemporaries. The worthlessness of many therapeutic measures in common use was thereby revealed, and so Skoda gradually reduced them to a minimum." J. Bauer, one of the younger representatives of the last Vienna school, is a disciple of Mannaberg (and thus indirectly of Nothnagel), of Obersteiner, Wagner-Jauregg, and a junior contemporary of Wenckebach, Chvostek, Ortner, and H. H. Meyer. He is now professor of clinical medicine in Los Angeles, California. In his book *Constitution and Disease* (Heinemann, London, 1942), reviewed in a leading article in the *Journal* of April 24, 1943 (p. 510), he writes in the chapter on "Principles of Treatment" (p. 186): "The physician carrying out a treatment must know as much as possible about the aetiology, pathogenesis, and consequences of a pathologic state that he is about to treat. Otherwise he deserves the title of quack rather than doctor. There cannot be any discussion about this point." Under the heading "Pitfalls and Errors" in the same chapter he criticizes the thoughtless application of vitamin therapy. He discusses at some length the errors that "occur through misjudgment of the nature and prognosis of essential hypertension, chiefly a constitutional disease." He then comments on the many pitfalls and errors occurring in endocrine therapy, his special field of study. He shows how ignorance or even incomplete knowledge, not only of the actions of different hormones but of small and large doses of the same hormone, may cause lasting harm. He concludes this chapter and his book with the following words: "We should be modest and more reluctant to interfere with the precise mechanism of the living machine without necessity. One of the most difficult tasks in medicine is *primum non nocere*!"

These sentences could have been used as motto by Linnell and Thomson for their article.—I am, etc.,

London, S.W.3. V. C. MEDVEI, M.D.Vienna, M.R.C.P.

## Possible Developments in Social Medicine

SIR—Excuse the personal note in this letter, but I wish, as one who has been interested in this subject for forty years, to thank Dr. Pemberton for his contribution (Dec. 11, p. 754): it is very encouraging. Don't let us be too timid, however, or we may fail the democracy we hope to serve. Prof. Ryle, in his admirable address, says that social medicine has nothing to do with politics, and here we tread on difficult ground. Party politics, yes; politics in the great sense of production of good citizens, no. Human values must come first every time: they are easily the "first priority."

Just one illustration of our dilemma. Plans are prepared for large ten-story flats to house families as well as other people. In other ways the plans are excellent and a great advance on pre-existing chaos, but in this one respect the human element has been subordinated to other considerations. Are we to keep silent? Mass flats will tend to produce the mass mind and stifle that tendency to variety upon which progress depends. No social worker will advocate flats for family life. It is a monstrous injustice to children, born and unborn. Some day, perhaps, social medicine will find a voice to pronounce firmly on these human affairs, and a blessed day it will be.—I am, etc.

NORMAN MACFADYEN.

Leeds, W. 10

## Wartime Appointments of Radiologists

SIR—The president and council of the British Institute of Radiology have recently had the opportunity to ascertain the feelings and views of a large number of radiologists who are at present serving with His Majesty's Forces overseas. These officers have, in many cases, been serving abroad for some years, and feel that they may not for some time be in a position to put forward their views or to maintain touch with those bodies by whom radiological appointments may be made during and immediately after the war. Considerable anxiety is felt by many officers that their interests may not be adequately considered, and that their position on return to civilian life may thereby suffer.

I am therefore instructed by the president and council of this Institute to bring these facts to the notice of consultative and appointing bodies for their information. The following suggestions are also put forward, and it is felt that their adoption would do much to relieve the very natural anxiety of radiologists, especially the younger radiologists, now serving overseas.

It is suggested that: (1) No radiological appointment be made for a longer period than the duration of hostilities. (2) Appointments made during the war, whether to British or alien nationals, be, where possible, made subject to review after demobilization has taken place. (3) Such conditions of appointment, if in force, should be clearly brought to the notice of applicants by the terms of the advertisement or otherwise.—I am, etc.,

HUGH DAVIES, D.M., D.M.R.E.,  
Hon. Med. Secretary,  
British Institute of Radiology.

## Artificial Insemination: Moral and Aesthetic Factors

SIR—Some recent correspondence in your columns must suggest to not a few of our profession that if we are to be worthy of the name of doctors—teachers—it behoves us to beware that what we teach is for the welfare of the community. There appear to be some who are prepared in certain circumstances to advocate extramarital artificial insemination. Such stances, however well-intentioned, may nevertheless be misguided. It is well to remember the old saying that hard cases make bad law, and before we accept such procedures as aesthetically and morally justifiable we should pause to consider their implications not only to individuals but to the community in general. If moral and aesthetic standards be loosened and "medical reasons" for this or that procedure become stretched to a point of infinite elasticity, then *facilis descensus Averno*.

There may be some who would say that medicine has no concern with morality, but is not medicine concerned with the general welfare? Morality signifies those standards of conduct which human experience down the ages has shown

to be desirable for the healthy functioning of human society, and herein sexual relationships are a fundamental issue. The begetting, bearing, and rearing of children involve moral and spiritual factors which cannot be ignored without detriment to the welfare of the community.—I am, etc.,

Birmingham

J. R. A. TODHUNTER.

## Medicine and Dentistry

SIR—I was much interested in the letter of Dr. L. Michaelis on dentistry as a specialty of medicine. The modern dentist, trained along with his medical colleagues, must be well versed in the art and knowledge of medical science, being fully conversant with all pathological manifestations in the mouth, whether of local or systemic origin. He must be aware of all general conditions which can be caused by oral sepsis, and in this matter assist in prophylactic medicine by educating the people on the essential factor of oral hygiene.

In 1919 Dr. A. C. Fones of America presented a report of the findings of a five-year demonstration in educational and preventive dentistry carried out in all the public schools of Bridgeport, Conn. (*Dental Cosmos*, 1919, 61, No. 7.) The scheme consisted of educating the school children in the correct method of oral hygiene and in its importance. A number of dental nurses were employed to see the plan was put into effect: they scaled and polished teeth, reporting all those needing further attention. There was a large reduction in the incidence of caries. Out of the death rates from all causes, he gives records of three diseases which are common among children—namely, diphtheria, measles, and scarlet fever. The following figures are a percentage based on 100,000 population:

	1914	1918
Diphtheria	36.6%	18.7%
Measles	20.0%	4.1%
Scarlet fever	14.1%	0.5%

During the great influenza scourge the deaths were only 5.2% per 1,000 population, the lowest on record in cities approaching the size of Bridgeport, Conn. Fones says: "When these various pernicious mouth conditions are more fully understood as the greatest factor in producing disease, medicine will acknowledge dentistry as a specialty. Also from the prophylactic standpoint, mouth hygiene will be considered the most important branch of general hygiene."

Although we lack more proof of the nature afforded by work of this kind, is it not reasonable to subscribe to the thesis that oral sepsis, apart from the question of focal infection, so reduces the resistance of the alimentary tract, respiratory system, and sinuses as to render them more susceptible to infection?

I think it will be agreed that dentistry has no small part to play in the nation's health services, and that it is in the interests of the medical profession to have an adequate dental service. Many outlived drawbacks of and prejudices against dentistry still exist, and this is reflected in the recent fall-off in the number of entrants into the dental schools. Unless adequate steps are taken, in ten years' time such an adequate service will not be possible. While the onus of raising the status of the dental profession and of ousting all these prejudices primarily rests on the shoulders of that profession, much can be done by those medically qualified by helping to educate not only the children but the masses of the public on the importance of oral hygiene.—I am, etc.,

D. JACKSON, B.D.S., L.D.S.,  
Resident Dental House-surgeon, Manchester  
Royal Infirmary.

## Pre-Nazi Medicine in Vienna

SIR—In reply to Dr. Alan Maberly's letter (Nov. 20, p. 661) I would like to make the following observations. I rather feel that your correspondent's criticisms of the medical services in Austria were not altogether fair. In the first place there was no State Medical Service in Austria, but rather an extended panel service, as suggested by the B.M.A. for this country. The hospitals, it is true, were mainly State or municipal, but this is common to most of Europe outside Great Britain. That this service was imperfect goes without saying, but there is no evidence that these imperfections were due to an excess of public control. The charge of inhumanity was not one I heard more often there than one does here. Moreover, the standards demanded by the patient, at least in Vienna, were high, as instanced by the fact that no doctor could get on the "panel" without having done at least two years in a hospital. The patients would no more have tolerated being "Number 793" (they had, and used, the right of complaint to the panel committee) than they would have tolerated a general practitioner



with "two entrances" to his surgery! Far be it from me to criticize the medical services in this country, for which I have the highest respect and with which it is difficult to compare a poor Central European country like Austria. However, it is worth while remembering that the part of the health services the Viennese was most proud of, and which he so often showed off to the admiring visitor, was the public health services run by the City of Vienna, as instanced by the fine tuberculosis and child welfare services, etc.—I am, etc.,

West Didsbury, Manchester. HERBERT E. BACH, M.D. Vienna.

\* \* This correspondence is now closed.—ED., B.M.J.

### Postgraduate Courses for Service Doctors

SIR,—There have been many letters which you have been good enough to print in your columns from Service medical officers about postgraduate courses after the war, with which many of us are in complete agreement. I think this is a very important matter which ought to be emphasized. Many of us would, before war broke out, have liked to take higher degrees or diplomas, but at the call of the Services have had to give up these ideas and also our jobs or practices, and in the case of married men our homes and families, and have made great sacrifices. We do not know what the future holds. In contrast to this, many young men in the Emergency Medical Services are sitting comparatively pretty and taking higher diplomas. We hear of young people taking the M.R.C.P. six or twelve months after qualifying. These are the people who will have all the advantages in the post-war medical world. It seems that this is unfair and needs investigation, for it may cause bad feeling afterwards.—I am, etc.,

S.M.O.

## Obituary

### J. SWIFT JOLY, M.D., F.R.C.S.

Mr. John Swift Joly, senior surgeon to St. Peter's Hospital for Stone, died at his home in London on Dec. 14 after a short illness. This came as very sad news to a large circle of patients and friends, for he occupied a leading position among urological consultants. He rose to this position owing partly to his outstanding scholarship and surgical skill and partly to his genial personality. He had the rare gift of making strangers feel themselves to be in the presence of a distinguished man and yet to feel at ease and at home. He was a good conversationalist, with a spice of Irish wit, and when he expressed his opinion on any controversial question his judgment always had the flavour of originality. In questions related to his own specialty his opinion was received with exceptional respect, almost with reverence. He had many quaint mannerisms which endeared him to those who had the privilege of knowing him well. For instance, he often signed his letters "Yours in haste," yet he never seemed to be in a hurry, but was willing to give time and attention to anyone who sought his aid, and he always gave generously, radiating confidence and tranquillity.

Swift Joly followed Sir John Thomson-Walker as senior surgeon to St. Peter's Hospital and seemed also to succeed him in his unique position among urological surgeons. In this circle he will, of course, be long remembered for his profound knowledge of every aspect of calculous disease of the urinary organs. His massive book on this subject was published in 1929 and became at once the authoritative work of reference. His skill and reputation as a urological surgeon brought visitors from all parts of the world to see him at work in the operating theatre at St. Peter's Hospital or to learn from him in the out-patient department. Whoever the visitor might be, renowned or obscure, he was assured of a courteous welcome. Many of Swift Joly's patients will feel that there is no one who can take his place and no one who can inspire quite the same confidence. His loss will be deeply mourned by all his patients—hospital and private alike—but even more, perhaps, by his professional colleagues, especially those who worked with him at St. Peter's Hospital. He took a personal interest in every detail of administration. He was the one to whom all could turn for advice, and he came to be loved and respected by all who worked at the hospital in any capacity.

John Swift Joly was born at Athlone in 1876, being the youngest son of the rector, the Rev. John Swift Joly. He studied medicine at Trinity College, Dublin, winning many prizes and scholarships, and graduated M.D. in 1902. Before taking the F.R.C.S. Eng. in 1907 he studied abroad at Berne and Vienna. After his appointment as assistant surgeon at St. Peter's Hospital for Stone he confined his practice to urological surgery and soon began the study of the pathology of calculous disease of the urinary tract, which was the subject of his presidential address to the Section of Urology of the Royal Society of Medicine and the theme of his book *Stone and Calculous Diseases of the Urinary Organs* (1929). During the war of 1914-18 he served in Egypt and Palestine as a major in the R.A.M.C., and was later appointed consulting urologist to the Navy. He always took a keen interest in the work of urological surgeons in other European countries and in America, and he was a corresponding member of the American, French, and Italian urological societies, and was delegate for Great Britain to the Société Internationale d'Urologie. For a time he acted as English secretary of the International Association of Urology and was always keenly interested in its activities.

Mr. Swift Joly lived and practised at 80, Harley Street, and it was there that his wife nursed him almost single-handed during his last illness. His son, at present a surgeon in the Navy, was able to visit him a few days before his death. The funeral was at Golders Green Crematorium on Dec. 16. It was Joly's wish that this should not be a public function, and the company consisted almost only of his colleagues from St. Peter's Hospital.

CUTHBERT DUKES.

### SIR ARTHUR HORN, C.M.G., M.D.

We regret to announce the death on Dec. 19 of Sir Arthur Edwin Horn, consulting physician to the Colonial Office and to the Crown Agents for the Colonies, at the age of 73.

A son of William Horn of Forest Hill, he was educated at the City of Westminster School and St. Mary's Hospital. He graduated B.Sc. Lond. (with honours) in 1896, M.B. in 1899, and M.D. in 1906; and obtained the D.T.M. of Cambridge in 1907 and the M.R.C.P. diploma in 1919. During the South African War he was a civilian surgeon attached to the Field Force. He joined the West African Medical Service in 1904 and served on the Gold Coast, in North and South Nigeria, and in Gambia, and received the thanks of the Secretary of State for the Colonies for his report on cerebrospinal fever in the Northern Territory of the Gold Coast (1908), and for his report on sleeping sickness in the Volta River District of the Gold Coast (1910). He was seconded for special service in 1910-12 and was appointed personal assistant to the Principal Medical Officer, Nigeria, in 1913. His next post was that of senior M.O. and member of the Executive and Legislative Council of Gambia. In 1920 he was attached to the Rockefeller Commission for Investigating Yellow Fever, and in the following year he became Director of Medical and Sanitary Services for Malaya. He was appointed medical secretary of the Colonial Advisory Medical and Sanitary Commission of the Colonial Office in 1923. Two years later he succeeded Sir William Prout as medical adviser to the Colonial Office, and in 1928 became consulting physician. He was created C.M.G. in 1922 and received a knighthood in 1937.

Sir Arthur Horn joined the British Medical Association in 1902; he was president of the 5th Congress of the Far East Association for Tropical Medicine in 1923. In addition to his official reports he contributed papers to the *Lancet* on the health of Europeans in West and in East Africa.

CHARLES FRANCIS FENTON died on Nov. 5 as the result of a street accident. He was born on Oct. 26, 1863, and educated at Brentwood Grammar School. At the age of 17 he was apprenticed to a tea-taster in Mincing Lane, but in 1882 became a student at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1886. He was a dresser to Sir Frederick Treves, contemporary with such people as F. J. Smith and young Jonathan Hutchinson (son of Sir Jonathan Hutchinson, the investigator of syphilis, whose name remains in "Hutchinson's teeth"). He went to Barking in 1888, after doing an assistantship at Wivenhoe, Essex, and acted at the same time as a clinical assistant at the London Hospital, and also at Moorfields. In 1896 Dr. Fenton was appointed part-time M.O.H. at Barking, which post he held until 1909, when full-time appointments for medical officers of health were first introduced on a national scale. While in charge of the first isolation hospital in Barking he was one of the first to use antidiaphtheric toxin in the area. He was of the old type of general practitioner, the true

family doctor who not only advised from a medical point of view but was the family adviser and friend also. Dr. Fenton was in practice in Barking for 55 years.—H. C. B.

Dr. JOHN ROBERT WILLIAMS of Penmaenmawr, J.P. for Caernarvonshire and at one time High Sheriff of the county, died in a nursing home on Dec. 15, aged 81. He studied medicine at the University of Edinburgh, taking the M.B. and C.M. degrees in 1890, and afterwards attended hospitals in London and Paris; he was then for a time demonstrator of anatomy at the Royal College of Surgeons of Edinburgh. For well over twenty years he held the posts of surgeon in the Penmaenmawr and Welsh Granite Quarries and visiting physician to the Manchester and Salford convalescent homes. Dr. J. R. Williams was a keen officer of the R.A.M.C.(T.F.), attaining the rank of major and being awarded the Territorial Decoration; in the last war he served over-seas with the 6th Battalion Welch Fusiliers. In 1922 he was appointed a Knight of Grace of the Order of St. John of Jerusalem in England. He joined the B.M.A. in 1899 and held office as president of the North Wales Branch in 1927-8. He was also a Fellow of the Physical Society and of the Royal Meteorological Society, and being a skilled draughtsman illustrated a number of medical and anatomical works. Until old age claimed him he enjoyed a day's shooting or sailing, and had long been a member of the Royal Welsh Yacht Club.

## Medical Notes in Parliament

### The Education Bill

The text of the new Education Bill, which when enacted will supersede all existing Education Acts, has now been issued. The Bill is based on the White Paper published last July (*Journal*, Sept. 4, p. 304), and includes all the legislative changes proposed in that paper.

### Training and Resettlement of Disabled Persons

Mr. TOMLINSON on Dec. 10 moved the second reading of the Disabled Persons (Employment) Bill. He said the report of the Interdepartmental Committee on the Rehabilitation and Resettlement of Disabled Persons, presented to the House in January, 1943, attempted for the first time to treat rehabilitation and resettlement as a single problem and a continuous process. It was felt that medical science and industrial experience might be complementary to one another. To let a patient know in hospital, soon after his accident and in the presence of his medical adviser, that someone was ready to assist him to take up his work when better, or to train him in other work, might assist more than anything else in making the skill of the surgeon effective. Whatever the disability and whether incurred in industry or on the battlefield, the first step must be to convince the patient that help was possible. Experience in an interim scheme had taught the value of training for a new occupation wherever the disability prevented return to a previous one. The work of the limb-fitting specialists under the Ministry of Pensions at the centres established for that purpose was beyond praise. Experience at Papworth showed that, with the doctor determining the number of hours the individual should work, such work under supervision aided recovery in many tuberculous cases. It was now part of the Bill to make provision for medical rehabilitation, which came under the comprehensive medical service and was being planned. The Bill dealt with the phases of rehabilitation and resettlement which were necessary in addition to medical treatment. It proposed courses of industrial rehabilitation and vocational training. It also proposed a statutory obligation on employers to assist disabled persons to get employment in the ordinary field of industry and commerce. Special facilities were proposed for those whose disablement unfitted them permanently, or for a substantial period, for ordinary employment. War-disabled persons were covered by the Bill like other disabled persons. In spite of the King's Roll, statutory compulsion to employ was necessary.

Major GATES said that in the Ford factory it had been shown that 88% of the jobs in that factory could be carried out by the disabled. Employers would find that the disabled were the most reliable workpeople and among the least accident and the least sickness prone. Mr. ISAACS recalled that the British Medical Association, in conjunction with the Trade Union Congress, had discussed these problems in 1937. Establishment of rehabilitation centres followed. Sir IAN FRASER said that in the last 30 years the percentage of unemployment among disabled men had never been so high as among the fit. Mr. MESSER was glad that the Bill would apply to persons suffering from congenital deformity.

Replying to the debate Mr. BEVIN said the Bill would dovetail in the new Education Bill. He hoped to set up local advisory committees, including hospital people.

The Bill was read a second time.

### Supply of Penicillin

Mr. CHARLES PEAT, in reply on Dec. 16 to Mr. Craik Henderson and Major Lyons, said arrangements had been made to produce as much penicillin as possible. There was at present only a small quantity. The total supply would for some considerable time be insufficient to meet Service requirements. Limited quantities were being made available, in consultation with the Ministry of Health and the Medical Research Council, for clinical trials. Efforts would also be made, as soon as circumstances permitted, to allocate some supplies for the civilian population, but he could give no indication when they would be generally available.

### Regulation 33B in Operation

Up to June 30, 1943, the latest date for which figures are available, the number of persons who were reported as alleged sources of venereal infection by two or more persons under treatment, which is necessary for the operation of Regulation 33B, was 110, and by the same date 71 of these had been brought under treatment by local authorities. About 220 other persons out of approximately 1,780 in respect of whom only one report reached medical officers of health (and who were not, therefore, subject to action under the Regulation) were induced to undertake treatment when informally approached as a result of the single report.

### Scientific Training and Research

A deputation from the Parliamentary and Scientific Committee was received on Dec. 15 by Mr. Ashley, Sir John Anderson, Sir William Jovitt, and Lord Cherwell. Lord SAMUEL headed the deputation, which asked for more Government encouragement to scientific and technical training after the war. Mr. E. W. SALT suggested an additional grant of £1,000,000 to the universities for research and training. Mr. ATLEE indicated that the Treasury was sympathetically inclined. He said plans for science, both fundamental and applied, were prominent in the thoughts of the Government.

### Recuperation of War Workers

Mr. WILLINK announced on Dec. 16 a scheme to provide treatment under medical supervision for workers showing signs of war strain although not suffering from serious illness. He said that in consultation with the Ministry of Labour he had decided, with the co-operation of the War Organization of the British Red Cross and Order of St. John, to arrange for workers to be admitted to a number of country houses hitherto used by that Organization as auxiliary hospitals but not at present needed for that purpose. The War Organization was now selecting accommodation suitable, geographically and otherwise, for this new use. This was an experiment in a new field of social medicine, and the provision must be on a modest scale in the first instance, as the number of centres available was limited. The intention was that individual workers would be selected by co-operative action on the part of their own doctors, their employers' medical officers, and the medical staff of his Department. The course of treatment, which would normally last for two weeks and sometimes rather longer, would consist of physical exercises, indoor and outdoor occupations, and organized games and excursions, all graded according to the condition of the individuals and conducted on lines as far removed as possible from what was usually called the hospital atmosphere. The object was not only to prevent further impairment of the worker's health but to tone him up, physically and mentally, so that he could return to his normal life with renewed vigour and efficiency.

### Medical Examination of Fitness for Mines

On Dec. 17, on the motion for the Christmas adjournment, Col. LANCASTER opened a discussion on the impending call of young men to the mines. He said recruiting by ballot ignored all the data collected by the Service Departments since the beginning of the war in regard to psychological tests. Medical examinations of these young men by district medical boards must be more searching than those made for recruits for the armed Forces. So far as South Wales was concerned, examination of the lungs would be necessary. In examining entrants for the Forces there was a reasonable expectation that minor deficiencies would be improved by military life. In the case of these young men there would be no safety margin. Within a month or so of their presenting themselves they would be going underground and there would be little opportunity of improvement in the medical condition. If they were not fit

they would be an increasing source of worry to already over-worked managements. If as a result of physical or temperamental disability these men were subsequently found unsuitable for mining they should be boarded out by the same medical board, thus saving the friction caused by this having to be done by the local medical practitioner. Machinery must be installed to get rid at the earliest moment of young men found to be unsuitable. At present in the Midlands area boys going into the pits were examined by the medical practitioners of the district. Mr. SLOAN said he had never known of any medical examination to which youths were put before going down the pit. He agreed that there should be one. Mr. COLEGATE also said he had never known of such examinations in his district. His friends would welcome medical examinations of the boys from mining villages who were recruited into the industry. Such entrants would be fewer if they had the same searching examination as for the drafted entrants.

Mr. BEVIN welcomed the acceptance of the idea of a medical examination. This must be a Government examination and must be carried out so that if a slight defect were found the person examined did not feel the world was at an end for him. The employer should not know the result. This should be a matter between the Board, the State, and the person concerned. It would be wrong to let a boy go into the pit if there was proneness to lung trouble. In the light of the last 30 years he thought there had not been enough research in the mining industry on what should be looked for in a medical examination. In the chemical trades it was found that to let people with certain tendencies go into certain processes meant ill-health and a great economic loss. He thought the mining examinations would result in a stepping-up of medical knowledge. The Government would exercise the greatest care and would try to learn from this experiment as it had done in connexion with the Services and in industry.

#### Scottish Scientific Advisory Committee

The present members of the Scientific Advisory Committee to the Secretary of State for Scotland are Sir John Orr (chairman), Prof. C. H. Browning, Prof. F. A. E. Crew, Prof. I. de Burgh Daly, Sir John Fraser, Prof. D. Murray Lyon, Sir Alex. Macgregor, Prof. T. J. Mackie, Sir Edward Mellanby, and Prof. W. J. Tulloch.

It is a practice of the Committee to delegate special investigations to expert subcommittees to which non-members are co-opted.

## The Services

The following appointments, awards, and mentions in recognition of gallant and distinguished services in Burma and on the Eastern Frontier of India have been announced in the *London Gazette*:

C.B.E. (Military Division).—Col. (Temp.) B. Basu, O.B.E., I.M.S. O.B.E. (Military Division).—Col. (Acting) J. A. Matheson, Col. (Temp.) M. Morris, Major (Temp. Lieut.-Col.) V. J. Perez, R.A.M.C.; Col. (Acting) C. C. Kapila, Major (Temp. Lieut.-Col.) C. F. J. Cropper, I.A.M.C. M.B.E. (Military Division).—Capt. (Acting Majors) G. D. W. Adamson, J. S. Kerss, R.A.M.C.; Capt. J. B. Hurl, J. G. Scott, R.A.M.C.; Major J. F. Shepherd, Capt. (Acting Major) L. S. F. Woodhead, Jemadars (Acting Subadars) (Assistant Surgeons) V. D. Sharma, C. Singh, I.A.M.C.; Assistant Surgeon (British Cadre) 1st Class A. V. Barker, I.M.D. D.S.O.—Major (Temp. Lieut.-Col.) G. R. Marshall, R.A.M.C. I.C.—Capt. N. P. Mahapatra, I.A.M.C. Mentioned in Despatches.—Brig (Temp.) G. D. MacAuley, D.S.O., M.C. (Acting) W. J. Officer, Majors (Temp. Lieut.-Cols.) D. M. Ahern, J. H. (Reserve of Officers), A. N. T. Meneses, R.A.M.C.; Capt. (Acting Lieut.-Col.) F. J. Manning, Capt. (Temp. Majors) J. D. Allan, J. C. Babbage, J. B. Meugh, R. A. O. Leroux, J. McGhie, R.A.M.C.; Capt. P. H. Birks, R. A. Coughlan, T. B. Harrison, W. H. Ashford-Brown, T. A. B. Mason, J. Morrison, H. O'Hara, M. C. A. Waymouth, D. G. C. Whyte, R.A.M.C.; Major-Gen A. C. Munro, C.B., K.H.P., Indian Army; Capt. B. K. Banerjee, I.M.S.; Col. A. C. Taylor, Col. (Temp.) J. E. Ainsley, Majors (Temp. Lieut.-Cols.) J. A. Anderson, J. Duffy, R.A.M.C.; Major (Acting Lieut.-Col.) G. F. Harris, Capt. (Temp. Majors) W. S. Hacon, H. B. T. Holland, D. S. Khatav, I.A.M.C.; Capt. A. E. Stevens, G. Audikesavala, B. Barat, G. V. Faulkner, K. N. Gabbar, C. K. Hasean, G. L. Joshi, M. A. Khan, M. Khan, A. I. Lakshminarayana, D. N. Manikala, A. K. Mukerji, J. L. Roberts, G. Quayle, R. S. Tata, R.A.M.C.; Lieut. (Temp. Capt.) N. R. Danl, N. J. McQueen, Lieut. (Acting Capt.) S. T. Gopalakrishnan, I.A.M.C.; Jemadar M. S. Qureshi, I.A.M.C.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Temp. Surg. Lieut. J. R. Ellis, R.N.V.R., for distinguished services in connexion with the operations which led to the capture of Sicily by Allied Forces, and of Temp. Surg. Lieut. A. A. McC. Miller, R.N.V.R., for services to the wounded after an air attack.

#### CASUALTIES IN THE MEDICAL SERVICES

Died on active service.—Capt. M. Evnine, R.A.M.C.  
Died.—War Subs. Capt. N. N. Wilson, R.A.M.C.  
Killed in an aircraft accident in South Africa.—Fl. Lieut. C. F. H. Winney, R.A.F.M.S.

## Universities and Colleges

### UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

*Final M.B., Ch.B., Part III.*—1A. H. Swiithinbank, J. Ainsworth, A. J. Beadel, K. W. Boggis, A. M. Brenner, E. F. B. Cadman, Constance N. Davis, P. S. Dearden, Margaret P. Diamond, E. G. Donovan, J. F. Fergusson, H. Francis, J. Gould, Betty Hargreaves, E. T. Harrison, H. Holden, Winifred L. Hollick, C. A. Hopkins, J. G. P. Jones, J. D. King, J. Langley, V. Letze, A. McPherson, W. E. S. Marshall, J. W. Maybury, Janet B. Mercer, Sheila L. Richardson, J. J. Rivlin, Irene W. Simpson, W. Sircus, C. Taylor, K. J. Thomas, D. W. Townley, Simone J. van Son, J. G. Warbrick, Elsie M. Whitaker, Margaret A. Williams, F. B. Wright. *Passed in Separate Subjects:* P. M. Edis (Surgery, Obstetrics, and Gynaecology), K. B. N. Freeman, A. A. Stone (Medicine, Obstetrics, and Gynaecology), J. E. Hall and Barbara I. Thompson (Medicine and Surgery). *Part I:* H. T. Davenport, Monica Drake, M. M. I. el Haddad, L. Griffiths, B. B. Harrison, Muriel E. St. Pier, W. I. Sanders.

1 Class II Honours and Distinction in Surgery.

### ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh, held on Dec. 17, with Prof. R. W. Johnstone, President, in the chair, the following who passed the requisite examinations were admitted Fellows:

A. C. Buchan, M. L. Burman, V. H. J. Davies, J. C. Dundon, G. R. Fiel, T. Fletcher, R. H. Foster, M. D. Hickey, W. D. Lovelock-Jones, W. E. Poller, G. I. Roberts, D. F. Walsh.

## Medical News

The Harben Lectures will be given in the Lecture Hall of the Royal Institute of Public Health and Hygiene, 28, Portland Place W., by Dr. Melville D. Mackenzie, chairman of the Medical Advisory Committee, Inter-Allied Committee for Post-war Requirements, on Jan. 24, 25, and 26 at 3 p.m. Dr. Mackenzie's subject is "A Study of the Potentialities of International Collaboration in Medicine in the Post-war World." Those wishing to be present are asked to notify the Secretary of the Institute. Admission is free.

The Association of Scientific Workers is arranging a film show at the Cambridge Theatre, London, W.C.2, on Sunday, Jan. 30, at 6.30 p.m., in aid of its Stalingrad Hospital Laboratory Fund. The main feature will be "World of Plenty," to be followed by other films of scientific interest. Tickets at 2s. 6d. to 21s. can be obtained from the association at 59, New Oxford Street, W.C.

Some of the aims of the Scientific Film Association, which came into being on Nov. 20, are: To promote the national and international use of the scientific film in order to achieve the widest possible understanding and appreciation of scientific method and outlook; to collect, collate, and distribute information on the scientific film; to publish comprehensive lists of films graded according to merit and suitability for audiences; to establish relations with Government Departments, public bodies, etc., which are in a position to make, use, or circulate scientific films; to organize a panel of scientists to advise film producers on scientific matters; to promote the production and distribution of scientific films; and to encourage the setting up of scientific film societies. The medical member of the council of the association is Mr. McAdam Eccles. Inquiries should be sent to the honorary secretary at 51, Fitzjohn Avenue, London, N.W.3.

The Bernhard Baron Trustees' grant of £30,000 towards the partial completion of the nurses' home of Queen Charlotte's Maternity Hospital is conditional on the work being carried out by the end of 1944, and this means that the hospital must raise the balance of £17,000 required in the next twelve months. Queen Charlotte's has already raised nearly half a million pounds towards completing the largest maternity hospital in the Empire.

The issue of the *Schweizerische Medizinische Wochenschrift* for Sept. 4 is devoted to papers on cancer read on Oct. 11, 1942, at the Swiss National League for the Campaign against Cancer.

The name of the Chartered Society of Massage and Medical Gymnastics has now, by permission of the Privy Council, been changed to the Chartered Society of Physiotherapy.

A Medical Faculty has recently been founded at Salonika, in which 400 students have been registered.

Dr. Leslie G. Housden has succeeded the late Dr. Eric Pritchard as one of the honorary medical advisers of the Save the Children Fund.

Dr. Eugenio A. Galli has been appointed president of the National Department of Hygiene of Argentina.

## EPIDEMIOLOGICAL NOTES

## Influenza

The number of deaths attributed to influenza in the great towns during the seven weeks Nov. 6 to Dec. 18 were 31, 46, 106, 375, 39, 1,148, and 1,115. These numbers would have been slightly higher—by about 9%—if the pre-1940 system of classification of deaths had been retained.

The wave of influenza that has spread over the country and the rapid increase in mortality common in large epidemics have aroused general concern. Noteworthy, also, are the reports of widespread epidemics in the U.S.A. and in Germany. The mortality figures are the only measurable indication we have of incidence. But distracted industrial managers, and, last but not least, the harassed and overburdened general practitioner, tell their own tale. Mortality falls on all classes alike, with the exception that infants under 2 in the lower social class have a higher mortality from influenza than those in the upper classes.

The epidemiology of influenza has been extensively studied, but adequate solutions to many of the problems have yet to be found, and results obtained from one epidemic are not in accordance with those of another. Influenza appears to be independent of climatic and meteorological conditions, for epidemics have occurred throughout the world and have begun at varying periods of the year. Though we have evidence that large influenza epidemics have appeared at intervals for several hundred years, this disease did not appear as a major cause in the classification of deaths in recent times until 1890. In that year 4,523 persons died from influenza, compared with an average of 99 for the ten preceding years. In the two following years—1891 and 1892—16,686 and 15,737 deaths were recorded, and the deaths remained at a high level during the subsequent years. From 1893 to 1917 the annual number of deaths ranged from 3,753 to 16,245. A feature of this period was the seasonal rise to a maximum in the early months of the year, generally from January to March. In June, 1918, the great epidemic began, and of the 112,329 deaths in that year 98,280 occurred in the fourth quarter. The epidemic declined during the winter but rose to a secondary maximum during the spring of 1919, and 44,801 deaths were recorded during that year. The mortality then declined, but remained above the level of the preceding thirty years. During 1920-39 the annual deaths varied from 5,019 to 29,084. The largest epidemics during this period were in 1922, 1927, 1929, and 1933, the number of deaths being respectively 21,498, 22,263, 29,084, and 22,990. In six of the remaining fourteen years the deaths numbered between 10,000 and 20,000. During recent years the seasonal trend has been fairly uniform, the deaths beginning to rise at the end of December or the beginning of January; the maximum occurred between the fourth and eighth weeks during 1937-43.

The present outbreak is in contrast to recent experience. It began about two months earlier than usual and has already reached a higher level than has been recorded since 1937. It is impossible to foretell its course. Previous large outbreaks have been almost symmetrical—a rapid rise to a maximum and an equally rapid fall. An epidemic usually lasts from 10 to 12 weeks. If the present epidemic follows this course it is probable that a secondary rise will occur in the late spring. Secondary epidemics are usually not so symmetrical as the primary epidemic and the peak is not so pronounced, but they persist for a longer period.

So far as is known there has been no large change in the distribution of the age of death, as was the case in the 1918 epidemic. During 1890 to 1917 influenza was chiefly concentrated at ages 55+, but in 1918 the age distribution of mortality underwent a sudden and remarkable change, and affected the younger members (under 35) of the population very much more than those at older ages.

## The Week Ending December 18

The returns of infectious diseases during the week for England and Wales included: scarlet fever 1,936, whooping-cough 1,400, diphtheria 550, measles 416, acute pneumonia 2,593, cerebrospinal fever 64, dysentery 133, paratyphoid 1, typhoid 3. There were 1,115 deaths due to influenza in the great towns.

J. P. Murphy, G. S. Bozalis, and E. J. Bieri (*Amer. J. Dis. Child.*, 1943, 66, 264) studied the blood diastase in 35 cases of mumps of all ages and both sexes with or without complications and at various stages of the disease, and found that in 58 determinations only 7 were below 200. They came to the conclusion that in the overwhelming majority of mumps cases the blood diastase is raised, whereas in cervical adenitis the diastase is low, so that this occurrence is of diagnostic value.

## INFECTIOUS DISEASES AND VITAL STATISTICS

No. 49

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 11.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever .. ..	77	10	28	2	2	75	6	16	2	5
Deaths .. ..	—	1	—	—	—	—	1	—	—	—
Diphtheria .. ..	634	29	178	126	45	1,079	41	265	86	25
Deaths .. ..	—	4	1	—	—	21	3	1	2	—
Dysentery .. ..	166	25	55	—	—	133	19	53	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	1	—	—	—	—	3	—	1	—	—
Deaths .. ..	—	1	—	—	—	—	1	—	—	—
Erysipelas .. ..	—	—	46	9	2	—	—	71	6	2
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	18	—	—	—	—	66	—
Deaths .. ..	44	7	9	10	5	51	5	9	10	2
Measles .. ..	444	50	53	44	1	13,287	459	563	36	25
Deaths .. ..	1	—	1	1	—	14	1	5	—	—
Ophthalmia neonatorum .. ..	66	1	2	13	1	69	5	12	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	2	—	1	—	—	7	1	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	2,956	251	29	7	7	989	61	11	5	1
Deaths (from influenza) .. ..	1,148	128	58	3	5	42	2	7	1	—
Pneumonia, primary .. ..	—	—	31	19	—	—	—	236	39	13
Deaths .. ..	—	176	30	18	—	—	—	23	—	—
Polio-encephalitis, acute .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute .. ..	11	—	—	1	—	7	—	2	12	4
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	4	10	—	—	—	2	13	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	162	7	10	—	—	174	15	22	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,564	178	316	25	86	2,769	145	453	95	39
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Smallpox .. ..	—	—	—	—	—	1	—	6	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	5	4	3	6	—	10	1	—	7	—
Deaths .. ..	—	—	—	—	—	1	1	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,641	149	233	23	24	1,326	72	46	29	7
Deaths .. ..	11	2	4	1	3	5	—	1	2	1
Deaths (0-1 year) .. ..	387	47	77	44	36	388	44	75	42	18
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	8,832	1,437	874	253	159	4,896	711	619	243	141
Annual death rate (per 1,000 persons living) .. ..	—	—	19.7	16.6	+	—	—	13.9	16.2	+
Live births .. ..	5,896	723	807	324	235	5,744	666	839	290	233
Annual rate per 1,000 persons living .. ..	—	—	16.5	21.3	+	—	—	17.3	19.4	+
Stillbirths .. ..	199	23	34	—	—	230	25	29	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	40	—	—	—	—	33	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Analgesia in Labour

**Q.**—What is the present position regarding analgesia during labour? Are there any risks in the use of scopolamine? What is the dosage recommended, and how early in labour should it be given? Is a rapidly acting barbiturate to be recommended, and if so in what dosage?

**A.**—A few women express a wish to go through labour unassisted by analgesics. Some of them change their views before labour ends. A few doctors claim that with adequate ante-natal preparation a woman does not need sedatives during labour, and encouraging results in small selected series are produced to support their view. The majority of patients and obstetricians believe that analgesia is necessary. If the choice and dosage of drug are wise and the administration timely, pain is relieved, labour is shortened, and is made safer for both mother and babe. Scopolamine gives its best results when used in combination with morphine, but considerable care is necessary if good results are to be obtained and unfortunate sequelae prevented. There should be a nurse adequately trained in obstetrics and in the use of this particular analgesic in constant attendance on the case. The doctor must be prepared to devote even more time than usual to watching the patient during her labour. There must be facilities for nursing the patient in a quiet room, and no sedative should be given, preferably, within 3 hours of the birth of the babe. Even with these precautions blue asphyxia is common, with the added risk for the babe of atelectasis and pulmonary infections. The use of scopolamine (hyoscine) is not free from risk. When first-stage pains become regular and strong 1/6 gr. morphine with 1/150 gr. scopolamine is given. Subsequently, 1/450 gr. is given as required to keep the patient quiet. It should not be repeated more frequently than hourly and should not be given in the second stage. The morphine is not repeated.

The barbiturates are widely used at the present time. One that does not produce the extreme excitement occasionally met with is to be preferred. A good combination is to give this by mouth in combination with morphine or heroin by injection when first-stage pains become strong and regular. In a primigravida 1/6 gr. heroin with 6 gr. hebaral gives excellent results in a normal labour lasting less than 24 hours.

#### Intra-uterine Douche in Puerperium

**Q.**—For some years I have used a copious intra-uterine douche followed by glycerin in puerperal cases with offensive lochia in large subinvolved uteri. This treatment facilitates drainage through an oedematous infected cervix and removes debris retained beyond the reach of eliotherapy. I have found the results consistently good. Fœtor is reduced and there has been no ease of spread of infection. There is little distress to the patient, and quite often dramatic results. An anaesthetic is never necessary. A review of the literature reveals that this practice is universally condemned, but no facts or figures are given to substantiate the condemnation. Wherein have I sinned?

**A.**—Not at all. You have been fortunate. If a uterus is infected and the flow of lochia is obstructed, the correct thing to do is to establish drainage. Gentle flushing with a hot intra-uterine douche is a reasonable and—as you have found—successful method of treatment. If, however, placental tissue is retained, then you are fortunate if you manage to wash it away in this fashion. To leave it is asking for trouble, and the wisest plan if you suspect the presence of retained placental tissue is to explore the uterus gently with the finger or with sponge forceps. To do this properly you will require an anaesthetic, and on occasions the retained tissue is closely attached to the uterine wall. The greatest care is essential if perforation is to be avoided.

#### Vertigo and Vomiting in Middle-aged Women

**Q.**—During the last two years I have had a very large number of patients suffering from vertigo for which I can find no adequate reason. The most severe case was one where feeding was difficult because whenever the head was raised from the pillow the patient vomited every time because the vertigo was so severe. The only constant factor in these cases appears to be that the patients are all women and all over 40. I may add that the majority are transient cases of a few weeks' duration, but some have been more persistent.

**A.**—It is not stated whether any other symptom or sign such as deafness or nystagmus was present, but apparently there was nothing except vomiting. It seems, therefore, not to be due to a unilateral obstruction of the Eustachian tube with labyrinthine disturbance. It might be functional or due to an epidemic of encephalitis. However, women over 40 often drink tea to excess, and this is quite able to produce severe attacks of vertigo with nystagmus and vomiting, but not necessarily deafness.

#### Food-poisoning Outbreak

**Q.**—During August, September, and October there were in a South Devon district a large number of cases of gastro-enteritis. The symptoms are severe prostration, vomiting, and diarrhoea, the latter of an explosive type, coming on suddenly at times and without warning. Colitis is prominent and persists after the gastric symptoms have subsided. The treatment consists of mixtures containing kaolin bismuth, rhei co., and sedatives. In one small village 50% of the inhabitants were stricken down suddenly. Suggestions for the treatment of the colitis would be welcomed.

**A.**—These outbreaks are almost certainly "food-poisoning" in its widest sense. The Salmonella and dysentery organisms are probable causes, the persistent colitis suggesting, more particularly, *B. dysenteriae*. Bacteriological diagnosis must be made before satisfactory treatment can be suggested. The condition, whether true dysentery or non-specific food-poisoning, is compulsorily notifiable to the medical officer of health.

#### What is Fibrositis?

**Q.**—What is the pathological explanation of the dramatically sudden and devastating onset of "fibrositis" in an acute attack of lumbago, whereby an apparently fit individual is converted in a fraction of a second into a helpless and agonized cripple? Why not a gradual onset?

**A.**—In his original description of fibrositis Sir William Gowers considered that the pain originated in the muscle spindles, the end-organs of the afferent nerves which lie between the muscle fibres and in intimate association with them. While it is obviously impossible to demonstrate the manner in which the characteristic pain is evoked, it may be assumed by analogy that it is due to compression of the muscle spindles by spasm of the adjacent muscle fibres, and is thus of a similar nature to the cramps commonly occurring in the muscles of the extremities. While the acute onset is brought about by some movement involving the muscles concerned, there has been a gradual accumulation of toxic products in the tissues leading up to the acute attack—when, so to speak, the pot boils over. Cases with a gradual onset are common enough both in the lumbar muscles and elsewhere, but rarely reach the same intensity of pain; anatomical relations, function, and blood supply all probably have a bearing. It is questionable whether the term fibrositis is not used too freely—sometimes, indeed, as a cloak for ignorance; and myalgia, myositis, fibromyositis might be recognized as varieties in close association in symptomatology. A symposium on fibrositis in its various aspects appeared in the *Annals of the Rheumatic Diseases*, December, 1940, vol. ii, No. 2.

#### A Hungry Diabetic

**Q.**—A potential diabetic, who can keep sugar-free by careful dieting and without insulin, finds his menu is very limited, and hunger is acute at times. Could you name some cereals or flour, or other preparations of a sustaining nature, that might be taken? Can soya flour be baked in loaf form or taken for breakfast as a cereal?

**A.**—If a potential diabetic, who is being carefully dieted, feels hungry he is not having enough to eat. The best treatment is to increase the carbohydrate of the diet sufficiently to satisfy the patient and to give insulin if glycosuria occurs. This treatment will improve his health very much, and he may then be able to give up insulin and still keep the urine sugar-free. If he refuses to have the best treatment, he could eat larger amounts of green vegetables, like cabbage, cauliflower, etc., which contain little carbohydrate, or he could use the so-called "diabetic foods." Some of these contain protein and fat and the minimum of carbohydrate, but many patients do not like their taste. Most so-called "diabetic foods" contain a fair amount of carbohydrate and are pleasant to take, but they may cause a return of the glycosuria. Soya-bean flour can be used for bread and cakes. The sooner a patient of this type starts insulin,

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## LETTERS, NOTES, ETC.

## Masturbation in Women

Dr. C. J. LODGE PATCH writes from Shrewsbury: I congratulate my colleague on her reply to a general practitioner on the above subject (Sept. 11, p. 349); but the patients to whom she refers are seeking relief because "they feel they are abnormal." Four questions were asked, and they do not seem to be answered dogmatically and unequivocally enough to bring the required relief. (1) *How widespread is this practice?* It is almost universal. Certainly more than 90% of normal women have masturbated at some time or another in their lives. It is commoner in women than in men for a variety of reasons, one being that the habit can be acquired and carried out "innocently." Havelock Ellis quotes the case of a lady of title, the president of a society for the suppression of vice, who discovered to her horror that she had been masturbating all her life without knowing what she had been doing! A practice so widespread can hardly be regarded as abnormal, and an appreciation of this fact should help to relieve the anxiety of the patient. (2) *Can it cause physical harm?* The physician should inquire what his patient does to obtain relief for her state of tension. If she employs the usual methods of titillating the clitoris or labia minora, or of rubbing the edges of the latter together in some way, he can conscientiously assure her that no physical injury will result. Certainly no more than from sexual intercourse. If she introduces foreign bodies into the vagina or (in rare cases) into the urethra, there is a risk of physical injury. It is important to ask what method the patient uses, and not whether she uses an artificial substitute for the male organ. The latter form of interrogation may suggest ideas which would not otherwise occur to the patient. If she has already adopted the latter technique, it will not be difficult to persuade her to discontinue it in favour of less injurious methods of producing the same result—orgasm and a relief of tension. (3) *Can it make normal intercourse less satisfactory?* A patient asks this question because she has already discovered, or has been told by a dissatisfied friend, that masturbation is preferable to marital intercourse. Comparisons are odious, but the underlying assumption is that she obtains complete sexual relief through masturbation, whereas she is left unsatisfied after conjugal union. She will be relieved to know that the fault may lie not with herself but with her husband. It is he (when he returns from over-seas) who may need the advice of a psychiatrist or physician. He may be thoughtless and selfish; he may have neglected the preliminary caresses which are so necessary for a woman before she can obtain complete gratification from the man she loves; or (the most common cause of marital dissatisfaction and nervous disturbance) he may, in good faith, practice coitus interruptus or "withdrawal." (4) *How can they be helped to overcome the habit?* A word of caution is necessary in answering this question. Masturbation is a sedative, and a comparatively harmless sedative, to the normal woman, provided it is practised within reasonable limits. Immediate cessation will certainly increase her sexual tension, and may precipitate nervous symptoms: an illustration of the cure being worse than the disease. If the habit is to be "overcome" it must be done gradually. A frank discussion of the first three questions in language which the patient can understand, and the measures suggested towards the end of the reply on page 349 (to which this letter is merely a supplement) should be sufficient for all normal individuals. In conclusion, I would like to endorse the opinion of my sister psychiatrist, that it is usually the neurotic who seeks advice; and that the neurosis is due not to physical but to mental traumata—feelings of guilt and anxiety, a sense of inferiority, etc.

## Parodontal Disease

Mr. R. V. TAIT, L.D.S. (Rickmansworth) writes: With reference to the question about bleeding gums (Oct. 23, p. 534), I should like to say that bleeding from the gums may be a symptom of gingivitis but is not necessarily a symptom of pyorrhoea alveolaris. Unfortunately there is much looseness in the terminology applied to parodontal diseases, and any case of marginal gingivitis where a purulent discharge can be expressed around the teeth is often described as pyorrhoea. The term "pyorrhoea alveolaris" implies a lesion of the alveolar bone. While a marginal gingivitis of long standing may result in progressive destruction of the alveolus, there are other cases in which the bone loss cannot be traced to any local cause but appears to be a bone dystrophy of obscure origin. It is this latter variety that can be described accurately as pyorrhoea alveolaris, and this is also the variety of parodontal disease for which no satisfactory treatment is known other than extraction of the teeth. In these cases, although pockets may be deep with a marked discharge of pus, marginal gingivitis and bleeding are sometimes remarkably absent. It should be emphasized that parodontal disease arising as a marginal gingivitis from local causes may be treated successfully even when it has caused bone resorption to a marked degree. Many teeth that might be conserved are being extracted because of a misdiagnosis of pyorrhoea alveolaris, when there is really no more than a chronic gingivitis. Gingivitis may

arise from a variety of causes, most of which act as direct irritants to the gum margin. General lack of oral cleanliness, deposits of calculus upon the teeth, ill-designed dentures, or faulty restorative work are among the most frequent causes, but irregularities of occlusion of the teeth play an important part. Treatment essentially falls within the province of the dental surgeon, entailing the correction of local factors exciting the inflammation and the elimination of all pockets, but the success of treatment depends upon the thoroughness with which the patient carries out a simple but precise daily routine of oral hygiene. Mouth washes and vitamin preparations, as are frequently prescribed by physicians, seldom alleviate symptoms, and do nothing to produce a cure because they fail to eradicate the cause.

## Action on Uterus of Antispasmodic Drug

Dr. M. GHOSH (Burton-on-Trent) writes: The following case has convinced me of the antispasmodic action of trasentin on the uterus, which may prove of value in various obstetrical and gynaecological conditions. A nullipara aged 40, with irregular menstrual history, was examined by me at an early stage of pregnancy. She gave a history of three previous pregnancies, ending by abortion between 16 and 20 weeks. I attended her in one about 6 years ago. I put her on a regime of vitamin E, thyroid, and luteal hormone. During what I estimated as the 16th week of pregnancy she had backache, which gradually got worse, and had spasmodic intermittent pain over her lower abdomen, accompanied by visible and palpable uterine contractions. Injection of 1/4 gr. morphine gave some relief of pain but little change in the uterine contraction. After about 12 hours one ampoule of trasentin was injected intramuscularly and two tablets given orally. The relief of pain and spasm was obvious. Another injection was given in 12 hours, and four more tablets orally. Now there was no pain or uterine contraction. Although there were no pain or uterine contractions one injection and 6 tablets were given daily for 3 days. The pregnancy has proceeded uneventfully to full term. She is waiting the onset of labour any day.

## Tropical Bubo

Dr. R. N. HALL (Kano, Nigeria) writes: I was interested in Brig. Stammers's article (May 29, p. 660). We treat large numbers of these cases and find that intravenous injections of *Ducrey bacillus* vaccine are by far the best. The injections are given on alternate days, starting with 250 million bacilli and increasing the dose according to the reaction. Most cases need only three injections. When we are short of vaccine we use intravenous boiled skimmed milk, and have found it more satisfactory than anthiomaline or T.A.B. vaccine. We have not been able to find *Ducrey's bacillus* in the pus from the buboes. Any surgical intervention or local application, other than aspiration, is unnecessary and inadvisable.

## Chemotherapy in Intestinal Infections

Capt. I. S. DALTON, I.M.S., writes: I notice that Dr. Austin CL ("Sulphonamide Chemotherapy of Intestinal Infections," July 1, p. 35) used 2 drachms of sodium sulphate night and morning for his third group of patients. Is not this drug much more effective when given two-hourly or four-hourly? Might not this method of administration have influenced the progress of these patients unfavourably? Twenty days seems rather a long time for cure in cases of "a mild character."

## Treatment of Sciatica

Dr. B. H. SHAW writes from Totnes: I was surprised to note Sir Arthur Hurst's article on "The Treatment of Sciatica" (Dec. 18) that no reference is made to local inductothermy, which I have found very successful even in cases of quite definite traumatic origin. I was under the impression that it was commonly prescribed where the apparatus was available.

## Oedema of Ankles in Hot Climate

Dr. W. WATSON NEWTON writes: On a voyage round Africa as S.M.O. of a troopship I suffered from a simple form of oedema of ankles which was so pronounced and persistent that it was with relief I found there was no albumin in my urine. Off the West Coast for 10 days or so of tropical heat I had no signs and it was only after a week or more of profuse sweating in the Red Sea area that the oedema appeared. My idea is that the condition is due to a change of the saline contents of the blood plasma caused by saline loss through sweating, and appears in the ankles as the most dependent parts of the body, where fluids would most likely gravitate. The oedema was always much improved by the night rest, and disappeared as soon as we reached a cooler climate.

## Correction

The last sentence of Dr. Wilfred Harris's letter on "The Treatment of Facial Palsy" (Dec. 25, p. 828) contained an unfortunate misprint. It should have ended "unless the nerve is decompressed or grafted."

# BRITISH MEDICAL JOURNAL

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## GUNSHOT WOUNDS OF THE HEAD IN THE ACUTE STAGE\*

BY

HUGH CAIRNS, D.M., F.R.C.S.

*Consultant Neurosurgeon to the Army at Home*

For my address I have chosen the subject of gunshot wounds of the head, with particular reference to surgical treatment in the acute stage. From the outset of the war the Army Medical Services encouraged segregation of head injuries under specialists in neurosurgery and neurology, both at home and abroad; and as a result of this policy information has now been collected which enables us to treat an increasing number of battle casualties with greater understanding and confidence than we possessed at the beginning of this war.

### Neurosurgical Tactics and Dispositions

Our experience is derived mainly from the work of our neurosurgical units in the Middle East and North Africa. The first neurosurgical unit was mobilized early in 1940. Major W. R. Henderson of Leeds and Major John Challis were largely responsible for working out the details of the neurosurgical and anaesthetic equipment respectively with the help of the appropriate branch of the Army Medical Directorate, Lord Nuffield, and Mr. A. R. Bullock of Morris Garages. The neurosurgical unit was not designed to nurse or feed its patients, and did not usually have its own x-ray equipment, but was in all other respects self-contained and able to work at C.C.S. or general hospital. It had its own vehicles, its own source of electric power for diathermy, suction pump, operating-theatre lights, operating-table heaters, and so forth. In an empty building or tent the unit could set up its equipment and be ready to operate within an hour, and it could pack up and move elsewhere in shorter time.

As things turned out, when we first joined battle with the enemy on land the mobile self-contained character of these units fitted the requirements of modern warfare. However, our first unit had been in France for only a few days before the battle began, and there was no time for the usefulness of its mobility to be appreciated. It was captured while in surgical charge of some 800 wounded. In a not dissimilar situation at Benghazi, 18 months later, another neurosurgical unit, under the command of Major P. B. Ascroft, was able to continue work until within a few hours of the Germans' entry and then to make good its escape with all its vehicles and equipment. Later, when we were advancing across Tripolitania and Tunisia the mobility of another unit enabled the late Major K. C. Eden to keep with the forward C.C.S. and to operate on the majority of the head injuries of the Eighth Army within 24 hours.

The original equipment of these units has now stood the test of several campaigns,† and has been to some extent copied in the mobile craniothoracic units of the Emergency Medical Service and the mobile surgical units of the Canadian Army.

\* A review of the work of the Neurosurgical Units of the British Army, being the presidential address to the Section of Neurology of the Royal Society of Medicine.

† In the Tunisian campaign Major Eden added a mobile operating van, built in a captured Italian motor coach (Eden, 1943).

The units have fitted in well with the rest of the Army Medical Services, not making disproportionate demands, and ready to turn their hands, when required, to urgent work outside their special field. However, there have been several alterations in the tactical use of the units. Early experience showed the difficulty of securing segregation of the wounded in the forward area. Both Henderson in France and Ascroft in the Western Desert found that no more than 10% of the wounds they were dealing with were head injuries. It was therefore decided that neurosurgical units should in future not work in advance of general hospitals. This policy was maintained with Major J. Schorstein's unit in North Africa, and at first with Eden's unit in the Middle East—until after the fall of Benghazi at the end of 1942. For Mareth and subsequent battles Eden, with the approval of the D.D.M.S., split his unit, leaving one section with a general hospital in Tripoli, and himself with the other section went forward to the most advanced C.C.S. From Mareth to Tunis the lines of communication were unusually narrow, and the majority of the head injuries passed through his hands (Eden, 1943). What he missed or was too busy to deal with went to the rear section of his unit at Tripoli. In this way Eden's unit dealt with most of the head injuries of the Eighth Army in the battles from Mareth to Tunis, and at an earlier stage than in previous campaigns. Out of 293 head injuries 188 were operated on within the first 24 hours, and only 34 were older than 3 days. The result was that the proportion of primary wound healing which he obtained reached the remarkable figure of 90%.

With the First Army Schorstein was in less favourable circumstances, for his lines of communication were more difficult. However, he has estimated that in the later stages of the Tunisia campaign about 75% of the head wounds of the First Army were passing through his hands. He was unable to retain cases for long, and the subsequent follow-up has not proved as easy as in the longer-established bases of the Eighth Army.

### Results

The results of some of our neurosurgical units are set out in Table I. It is difficult to make comparisons, for there are so many variables—in particular the age of the wound at the time when the wounded man receives expert surgical treatment. But we must attempt to establish some standard, and the results of our different units are in some respects remarkably consistent. From the last war we have Cushing's well-documented series for comparison. From the Eastern Front in this war there are almost no precise figures as yet available to us.

### Non-penetrating Wounds

In non-penetrating wounds—that is to say, wounds of the scalp and skull without penetration of the dura—there is practically no mortality. Ascroft, Eden, and Schorstein between them report 459 non-penetrating head wounds, with 3 deaths. One of these was from severe cerebral contusion; one from



penetration of the lateral sinus by a spicule of bone, followed by septic thrombophlebitis of the lateral sinus and pyaemic abscesses of the lungs; and one from a tear of the internal carotid artery in the carotid canal.\*

Non-penetrating wounds are, to be sure, not wholly free from complications: among the cases from Dunkirk there were two of septic scalp wounds which were followed by intracranial abscess (Cairns, 1941); but if the wound is adequately treated in the initial stages subsequent intracranial infection should be rare.

From time to time since the beginning of the war the need for more careful surgical treatment of scalp wounds has been stressed (McKissock and Browncombe, 1941; Botterell and Jefferson, 1942). I believe that there has been considerable improvement, but both at home and abroad a serious difference still exists between the scalp wounds treated by the general surgeon and those of the neurosurgeon. In the recent campaigns Eden and Schorstein have been able to send their patients with scalp wounds back to duty in 10 to 21 days; but when a stitched scalp wound is suppurating and still contains fragments of dirt and hair which should have been removed at the original operation many weeks must elapse before the soldier is ready for duty again. In the Army, wherever neurosurgeons are available, there is an increasing tendency to send all these cases to them. But there are not enough neurosurgeons to supply all the needs of the Army—or, for that matter, the needs of the civilian population in this respect—and it is abundantly clear that general surgeons, or the new class of accident surgeons, must continue to deal with the majority of the scalp wounds which occur in this country. Technically there is nothing difficult about scalp closure, but, like other techniques, it must be learned. As Jefferson has pointed out, the general surgeon can best learn this at the operating table, handling the tools under the guidance of the neurosurgeon.

#### Penetrating Wounds

Let us now consider the results of treatment of penetrating gunshot wounds (Table I).

TABLE I.—Penetrating Brain Injuries

Surgeon	Total Head Wounds	Penetrating Wounds				Remarks
		Total	Mortality (% in brackets)	Primary Healing (%)	Deaths from Infection (%)	
Ascroft (1943)	516	292	44 (15.0)	67 (fresh) 22 (old)	10.8	Base
Eden (1943)	325	102	24 (23.6)	65.5	3.7	C.C.S.
Schorstein	—	112	15 (13.4)	67.6	Low	Forward base
Sorgo (1942)	—	29	13 (44.8)	—	34.5	—
Cushing (1918)	250	133	60 (45.1)	Ca. 70	36.5	C.C.S.

Ascroft was working at the base, and most of his cases had been operated on in the forward area by general surgeons before they reached him three or more days after being wounded. He was subsequently able to observe their progress or 60 days. The low mortality (15%) is an indication of his distance from the firing line: the nearer the front line the higher the mortality. Major Schorstein reports that of 7 men with head injuries in one battalion only 1 survived more than a few hours. In Ascroft's series a remarkably high percentage of cases developed brain abscess while under his care—75 in 292, or practically one in every four penetrating wounds. In the cases first operated on in the forward area by general surgeons the incidence of subsequent brain abscess was more than twice as high as it was in the cases first operated on by Ascroft's team, even though Ascroft's cases were considerably older at the time of operation than those operated on in the forward area. A similar high incidence of cerebral abscess after penetrating brain wounds has been noted by the Russians, and they, like us, have had encouraging results in treatment. Ascroft

had a mortality rate of 25% in his abscesses. Bakulov (1943) reports that in Russia the mortality for brain abscesses, at a specialized evacuation hospital has been reduced to 16.8%.

In the last war Cushing recorded a high incidence of brain abscess, but his cases differ from Ascroft's, and presumably from the Russian cases, in the fact that the abscess came on much earlier and was quickly followed by fatal meningitis. Thus, in penetrating wounds Cushing's total mortality from infection was 36.5%, whereas Ascroft's is 10.8%.

Eden's cases provide an unselected sample of wounded as seen at the C.C.S. level. Thus, 28% of his cases had wounds in other parts of the body. Of the head wounds two-thirds were non-penetrating and one-third penetrating. For penetrating wounds his operative mortality was 23.6%, and mostly due to the initial brain damage. In Ascroft's series there were 73 consecutive "fresh" brain wounds flown from Alamein to the base within 24 to 48 hours of injury, and in these the operative mortality was 25%—practically the same as Eden's. Eden was able to follow most of his cases for up to three months, and there were only 5 cases of meningitis and 1 case of brain abscess. Schorstein's results have been similar to Eden's, but thus far he has been able to follow the subsequent course of only a small proportion of his cases.

Compared with Ascroft's series this represents a remarkable reduction in the incidence of intracranial infection, which is to be explained by the fact that Eden got his cases at a much earlier stage and before they had been operated on by the general surgeon. The end-results as regards life were not so vastly different, Eden's death rate from intracranial infection among those who survived the initial effects of the brain injury being 3.7%, as compared with Ascroft's 10.8%. But the low incidence of abscess in Eden's series has meant a considerable lightening of the work of the neurosurgeons at the base, and probably a reduction in the incidence of post-traumatic epilepsy, if we may judge from Ascroft's finding of a close correlation between the incidence of wound sepsis and post-traumatic epilepsy.

Eden's cases are closely comparable with Cushing's: both worked at a C.C.S. and received "fresh" cases mostly less than 48 hours old. Eden's cases show a remarkable reduction of fatal post-operative infection—3.7%, as compared with 36.5%. This cannot be wholly explained on the basis of improvements in operative technique, nor probably on the addition of sulphonamides. Eden's work lay in North Africa and Cushing's was in France. The only figures so far available from a European front in this war—those of Sorgo from Germany—show for a series of wounds treated late an incidence of intracranial infection almost as high as Cushing's. There is another difference to be borne in mind as between Eden's and Cushing's cases: Eden was dealing with an unselected series, whereas Cushing's cases were selected from among the more serious of a large number of head wounds.

All the neurosurgeons whose work is given in Table I appear to have a primary healing rate in penetrating injuries of between 60 and 70%. In many instances this estimate is necessarily based on observation of the wound for no more than one week after operation, owing to the difficulty of retaining patients. This test is far from stringent, for many war wounds break down slightly in the second or third week. Ascroft's figure of 22% of primary healing for old cases refers to the behaviour of a group of wounds operated on in the forward area by other surgeons and subsequently observed by him at the base.

We may summarize the results thus far obtained in North Africa in the treatment of penetrating brain injuries as follows: Of the patients reaching the C.C.S. about 20% die from brain damage within the next few days. If the initial operative treatment is not thorough and an expectant policy is subsequently adopted, about one in every four of those who survive to be evacuated develops brain abscess or meningitis. This is not dissimilar from the results obtained in France in the last war, when there was a 1 in 3 incidence of intracranial infection; but with the important difference that in the last war the intracranial infection was rapidly fatal at the C.C.S. and few cases survived long enough to develop brain abscess at the base. Recent neurosurgical work in North Africa has shown that when head cases can be segregated at the C.C.S. level and can there be radically operated on within 24 hours of injury

\* In the battles of Passchendaele in 1917 Cushing dealt with 76 non-penetrating wounds, with 6 deaths. At the C.C.S. at which he was working 50% of the battle casualties with head wounds were passed straight on to the base, and his material was presumably selected from among the more serious cases.

by a fully equipped team of experts trained in the not difficult technique of war neurosurgery, there is a considerable improvement. The result: the complication of brain abscess or other forms of intracranial infection can be almost, though not entirely, eliminated.

In modern warfare, where large forces are involved on a wide front, conditions favouring segregation of wounded in the forward area may not occur often, but the advantages to be gained in the way of improvement of results are at present so great that the most forward neurosurgical unit should be mobile and capable at short notice of sending an operating team to the forward C.C.S. In the future, improvements in chemotherapy and in certain campaigns air evacuation, may diminish the need for head surgery in the forward area; the arrangements are flexible enough to enable our armies to take advantage of such altered circumstances.

### Bacterial Infection

Surprisingly little work has been done in the past on the bacteriology of head wounds. In the Sicilian campaign Major Scott Thomson examined material from 36 of our cases and found that all but one contained bacteria (Cairns, Eden, and Schorstein, 1943). The Russians found in 300 head wounds only 2 which were sterile (Report by a Committee of Soviet Scientists, 1943).

In the 36 Sicilian cases, most of which were 3 to 12 days old, the predominating infective organism was *Staph. aureus*.

TABLE II—Brain Wounds 72 Hours Old and Older at Time of Operation

Surgeon	No. of Cases	Died	Discharged	Present Long-term	Primary Wound Healing	Remarks
Eden, Cairns, Eden, and Schorstein (1943)	23	7	2	6	10	Sulphonamides
Watt (1942)	23	3	2	1	6	Penicillin locally
Watt (1942)	29	13	10	—	—	Dural closure 19 cases > 72 hours old

*Staph. aureus* was found in 23 haemolytic streptococci (always with *Staph. aureus*) in 4, and pneumococci in 1. The other organisms found included *Staph. albus*, coliforms, and clostridia. In the penetrating injuries of this group naked-eye examination at operation, combined with bacteriological examination, showed that the infection most usually began under the scalp or in the temporal muscle and spread inwards to the brain.

Case 1.—Marine P. Penetrating right frontal wound and compound fracture of left tibia three days before. After being wounded he was given 2.5 g. of one of the sulphonamide drugs by mouth seven hours after being wounded both his wounds were excised and sulphanilamide was applied to them. Thereafter he had 3 g. of sulphadiazine intravenously, which was repeated after 12 hours at least two more doses. Three days after being wounded his head wound was reopened at a neurosurgical unit. In the subcutaneous tissue there were isolated streaks of thick yellowish-white pus from which *Staph. aureus* was grown. Elsewhere there was firm healthy-looking clot. When this was removed soft pulped brain tissue containing fragments of bone was found protruding through the hole in the dura. Similar tissue and five bone fragments were sucked out of the brain to a depth of 4 cm. Cultures from the bone yielded *Staph. albus*, *B. coli*, and diphtheroids.

In 11 of our cases from the Sicilian campaign Major Scott Thomson examined bacteriological material from different levels of the wound. Pyogenic organisms were present in 3 cases at all levels of the wound, in 6 cases in the superficial layers only, and in 2 cases in the brain only. At operation pus was found in the superficial layers of the wound, under the scalp, or in the temporal muscle, but not in the brain; in 3 cases both the superficial layers and the brain contained pus.

Additional evidence is provided by the observation that the brain abscess develops usually in those cases in which the wound continues to suppurate, and less commonly in cases in which the skin heals by first intention. Thus, in most cases the infection first develops superficially and then spreads inwards. These observations suggest that early sterilization

of the superficial parts of the wound would considerably reduce the incidence of subsequent intracranial infection.

One outstanding question is whether infections on the European fronts are more intense than those in the Western Desert and North Africa. In limb wounds the incidence of gas gangrene has been considerably less in the Western Desert than it was in France in the last war. In brain wounds in the last war Cushing reported gas infection of the brain, and *B. welchii* was cultivated from brain wounds, but no systematic bacteriological examinations appear to have been made. In this war the Russians have recently reported that a large proportion of deaths from brain wounds are due to pathogenic anaerobes (Report by a Committee of Soviet Scientists, 1943). Now, it is well known that many wounds contaminated with clostridia do not develop gas gangrene. Clostridia are found in brain wounds. But the organisms of gas gangrene require anaerobic conditions in which to multiply and become pathogenic, and on theoretical grounds it is difficult to see how such conditions can be obtained in the brain if at operation the brain wound is cleared of necrotic material. It is rare in head wounds for a large part of the brain to be deprived of its blood supply, as happens not infrequently in a wounded limb. Clinically, the cases described by the Russians as suffering from gas infection of the brain do not differ from what we have seen in fatal brain injuries due to Gram-positive cocci. Gas can occur in brain wounds without gas gangrene. That there has been no gas gangrene of the brain in the Middle East is the view of Major MacLellan, O.C. of a mobile pathological laboratory attached to the Eighth Army, who has investigated personally the majority of the cases of gas gangrene which have occurred in the Western Desert and has also studied some 58 head wounds bacteriologically.

This is an important question, on which further information would be welcome, because the Russians recommend the use of anti-gas-gangrene serum in infected brain wounds, though their views on this question are evidently not unanimous (Kadin, 1943).

### Operative Technique

A preliminary radiograph of the skull is essential, to show the situation and extent of so-driven bone and metal fragments. The technique of operation has been well described by Ascroft, and there is no need to do more than recapitulate the main points, which are: minimal trimming of the scalp edge; thorough removal of dirt, hairs, metal fragments, etc., from the subcutaneous spaces; removal of bone sufficient to expose the dural opening; and thorough removal of clot, pulped brain, hairs, and bone chips from the wound—also any metal which happens to present in the brain wound, but no attempt is made to search for deeply penetrating metal fragments. To removing in-driven bone fragments particular care is necessary when, as shown by radiographs, the bone fragments lie against the medial surface of the cerebral hemisphere or in the neighbourhood of the Sylvian fissure. In these situations dislodgment of a bone fragment may start severe haemorrhage from a cortical artery. When the wound is clean and dry it is dusted with a sulphonamide, and sulphathiazole has been used in some hundreds of brain wounds with no reactions of the kind described by Watt and Alexander (1942) as occurring in uninjured brains. The scalp is closed, as Ascroft puts it, "in the absence of gross sepsis," particular care being taken to avoid undue tension at any one part of the wound, and for this purpose plastic procedures may be necessary.

Eden and Schorstein, if I interpret their work correctly, have concentrated increasingly on the need to obtain firm closure of the wound. They have also dealt in uncompromising fashion with cases already excised and sutured in the forward area. If radiographs still show retained bone chips in the brain—as all too often, unfortunately, is the case—they do not hesitate to re-excite the wound, clean out the brain cavity, and then resuture the wound, a procedure which sometimes entails the most extensive plastic measures.

In certain special situations brain wounds present additional difficulties. Wounds of the sagittal and lateral sinuses may be suspected when radiographs show penetration of the skull or in-driven bone fragments in the neighbourhood of the venous sinuses. The particular danger in these cases is a severe, even uncontrollable, haemorrhage. In such cases blood

transfusion should be quickly available if required, the patient should be operated on with his head raised (there is little or no bleeding from the sagittal sinus in a patient who is sitting up in a dental chair), and removal of the bone around the wound should proceed very cautiously until the blood sinus is exposed.

Wounds involving the eye, the accessory nasal sinuses, and the brain present a special difficulty, inasmuch as it is necessary to repair the dura over the sinuses, as well as to close the scalp wound, in order to seal off the brain cavity. This is an operation of considerable magnitude, involving usually fascia lata grafting of the dura covering the poles and inferior surfaces of one or both frontal lobes. In the acute stage the patient may not be fit enough, or the surgeon may not have time enough, for such a prolonged operation. Schorstein (1943) has recently had considerable success in such cases with vaseline gauze packs after débridement. His results do not bear out Tonnin's gloomy view of the inevitability of meningitis in such cases.

Another variety of case which calls for special treatment is the small, clean, penetrating head wound associated with persisting neurological signs—for example, the parietal wound with contralateral hemiplegia. Such cases are probably best dealt with by an osteoplastic flap which has the wound in its centre, a type of operation which was strongly advocated by the French in 1940 for the majority of brain wounds. In the variety of case which we are now considering the osteoplastic flap is the best means of securing a really adequate exposure of the brain wound and thorough removal of the intracerebral clot which is usually present, sometimes as the result of delayed haemorrhage (late apoplexy). Risks of spreading sepsis of the bone flap are small in such cases, for the wounds of which I am speaking now are usually clean, and the methods of preventing infection by means of bacteriostatic substances are becoming increasingly effective.

#### Chemotherapy

Sulphonamides have been very extensively applied, both locally and parenterally, in the treatment of war wounds, and it is unfortunate that no large-scale experiment as to their value was undertaken before their use became general. At this stage it would be extremely difficult to introduce a controlled experiment. There are good theoretical grounds for believing that sulphonamides effectively diminish streptococcal contamination of fresh wounds, but their action on staphylococci is weak and there is no evidence to support the view that they are active in the presence of pus. The Eighth Army has developed the use of sulphonamides in the forward area to a high level of efficiency, and there were few cases in the Sicilian campaign which had not had sulphonamides locally, and in the severe wounds parenterally as well, by the time they arrived back in Tripoli and Sousse 2 to 12 days after being wounded. Yet practically all these wounds were infected—the majority with Gram-positive pyogens—and a considerable proportion were suppurating. Thus, of 22 brain wounds 3 to 12 days old, 19 were infected with Gram-positive pyogenic organisms and 13 were to the naked eye purulent. Here are some examples:

**Case 2.**—Pte. W. T. Multiple wounds, including penetrating right frontal wound. Six hours later excised and dressed with 10 g. sulphathiazole. Sulphadiazine was given intravenously for the next five days, also 5 g. intraperitoneally on the day after injury, when negative exploration of the abdomen was done in the fear that he was developing peritonitis from one of his wounds. Total sulphadiazine, 23 g. On the eighth day, at Tripoli, there was pus beneath the scalp of the right frontal wound (*Staph. aureus*); the other wounds showed no pus or bacterial growth on culture.

**Case 3.**—Pte. F. S. Left occipital wound. Excised the same day. Dressed with sulphathiazole. Given 34 g. of sulphathiazole by mouth in the next seven days. On the eighth day, when the wound was reopened, free pus was found (*Staph. aureus*).

It might be argued that sulphonamides were given to these patients at irregular intervals and that a good concentration of the drug could not have been maintained. I don't doubt that this is true, but it is questionable whether in the forward area administration of the drug can ever be regular. In the course of his journey back to the forward base the wounded man may go to R.A.P., M.D.S., one or more C.C.S.s, hospital

train, or M.A. convalescent, or hospital ship. In such conditions it is extremely difficult to maintain even regular administration of fluids.

Although large-scale trials of sulphur amides are now practically impossible in war wounds, I think some useful investigation in a small way might still be done with the head wound. It would be impracticable to alter practice in the forward area, but at the head centre, taking all cases less than 24 hours old, alternate cases could be done without any further sulphur amides, and the results compared with those which had further sulphur amides. Experience suggests that there would be a reasonable experiment, and if the results showed a significant difference in the two groups, then the 2-day-off-ferm could be tried, and so on. Such an investigation would at least help to put chemotherapy at the head centres on a rational basis.

#### Penicillin

Experimental and clinical tests have shown that penicillin is a most powerful bacteriostatic agent, preventing the multiplication of staphylococci, streptococci, pneumococci, clostridia and other organisms, and not inactivated by the presence of pus. Given parenterally it does not appear in the cerebrospinal fluid (Abraham *et al.*, 1941), though when the meninges are inflamed traces of it may pass through the blood-brain barrier. With the help of Prof. Florey a trial was therefore made by neurosurgical units at Tripoli and Sousse of penicillin applied locally to brain wounds of the Battle of Sicily. Wounds 3 days old or older were chosen because there was not enough material to do alternate cases, and Eiden's earlier work had shown that the results of operation on recent wounds by current methods were very good. The method employed was to expose and suture the wound as described above. Before the wound was closed a fine rubber tube was led through a stab-hole into the brain cavity and calcium penicillin solution (250 units per ccm) was injected into the cavity twice daily for 4 to 5 days. The average amount used was 15,000 units per case, but in future cases the total dose would probably be smaller. Before each injection the contents of the brain wound were aspirated.

During the battle 25 cases of penetrating brain wound 3 to 12 days old were admitted. On arrival 2 were moribund with large brain fungus; these were not operated on, and the died shortly after admission. Of the 23 wounds 3 to 12 days old, 13 were at the time of operation purulent to the naked eye, some with pus under the scalp or in the temporal muscle; others with pus in the brain and in the superficial layers. Four of the wounds presented a brain fungus. Nineteen of the 22 cases examined were shown to be infected with Gram-positive pyogens. All these wounds—purulent as well as non-purulent—were closed completely, except one in which there was so much skin loss that it was only possible to close part of the wound.

This work will be reported in detail elsewhere (Cairns, Eder and Schorstein, 1943). By regular examination of the aspirated fluid we found that after two days' treatment Gram-positive organisms disappeared in all except 2 cases. One of these was a case of orbito-mastoid wound in which the wound cavity still remained connected with the middle ear and external auditory canal—an open wound, from which the penicillin solution escaped almost as soon as it was instilled. The other was a patient, reported to have *Staph. albus* on the third day in whom subsequently a penicillin-resistant *Staph. aureus* was found. This man was suspected of having an abscess, but no sign of anything developed up to 30 days. In all cases Gram-negatives—*pyocyanus*, *proteus*, and *coli*—persisted usually until the discharge through tube or drainage-hole ceased. If the wounds gaped at any point, as sometimes after a week they did, *Staph. aureus* could occasionally be grown again from the raw surface, but did not appear to interfere with healing.

Three of these 23 patients died—one from an intracerebral clot and the other two from infection. One of these had a severely infected 8-day-old left frontal wound with a brain fungus, and in the left frontal lobe in-driven bone fragments and three different brain abscesses from which pneumococcus was grown. He died of spreading cerebral oedema about 48 hours after operation, and at necropsy still had pneumococci in the abscess wall. Penicillin didn't get a long enough application in this case. Possibly it would have been better to treat him

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## GUNSHOT WOUNDS OF THE HEAD

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expectantly for a few days, as the Germans have recommended for brain wounds of this age (Lonnis, 1941), but with the addition of local and parenteral sodium penicillin.

The other case was that of a man with an 8-day-old right frontal wound infected with *Staph. aureus* whose pus became Gram-negative under penicillin treatment (in addition to calcium penicillin, applied locally to the brain wound, he had sodium penicillin, 485,000 units intramuscularly, because of a compound fracture of the femur). This man became drowsy and died on the tenth day after operation; at necropsy an abscess was found in the right frontal lobe which had been incompletely tapped during the last days of his illness. This case is a failure of surgical technique, and it shows the importance of maintaining drainage during penicillin treatment.

Wound healing in the 20 survivors, observed for not less than three weeks in all but 5 cases, was by first intention in 6 cases. In 13 there was a slight gape or sinus in the wound, usually at the site of greatest tension, but most of the wounds healed by first intention. These gapes were usually not serious, for only in one case did a small fungus appear during healing.

These results compare favourably with other series of wounds of similar age (Table II), especially when we consider that more than half of the wounds were purulent and would not hitherto have been sewn up. But the series is small and has not yet been followed up for more than 62 days. Brain abscess might still appear in some.

During the Battle of Sicily the opportunity also presented of treating 17 cases of non-penetrating wounds, 14 to 16 days old, locally with penicillin, usually as a solution, sometimes in powder form. The older cases were heavily infected, with fractures of the skull and bare bone lying at the bottom of a suppurating granulating wound. These wounds and the underlying skull were excised and sutured, and all except two healed satisfactorily, though certain technical mistakes were made at first and temporary sinus formation was not uncommon. In these cases the bacteriological results were not so satisfactory as in the penetrating wounds: in a number the purulent discharge from the sinus continued to show Gram-positive organisms, and these were with one exception cases in which the skull had been fractured. Penicillin is so certain in its effects on Gram-positive cocci, apart from the occasional penicillin-resistant strain, that it is reasonably certain that the solution did not reach all the infected parts. The assumption may be made that there were small foci of osteomyelitis beyond the margin of excised bone. In gunshot wounds exposing and perhaps breaking the skull it is unlikely, when surgical treatment is not immediately available, that good healing will be obtained unless the exposed (and probably infected) bone is very widely excised.

Of penicillin treatment all that we are entitled to say at this stage is that the results are not unpromising. Though penicillin is in great demand and short supply, little is required in the treatment of head cases, and further developments in the technique of its use will be made.

## Summary

The treatment of gunshot wounds of the head by neurosurgical units of the British Army in the Middle East and in North Africa is reported.

Three units treated 459 non-penetrating head injuries (wounds of the scalp and skull with dura intact), with 3 deaths.

There were 506 penetrating brain injuries, with 83 deaths. The variation of mortality in the different series depended largely on the level on the lines of communication at which each unit was working.

In penetrating brain wounds, when the initial debridement was incomplete, about 25% of those who survived the immediate effects of brain injury subsequently developed brain abscess. The onset of intracranial infection occurred later than in the case of the 1914-18 war, and a considerable proportion recovered with further treatment.

At the C.C.S. level 28% of head wounds were complicated by wounds in other parts of the body. Non-penetrating head wounds were twice as common as brain wounds. The mortality for brain wounds was about 25%. In "fresh" cases operated on by neurosurgeons the incidence of post-operative intracranial infection was minimal (3.7%).

Of 36 head wounds 3 to 12 days old all but one were found to contain bacteria. The predominating infecting organism was

*Staph. aureus* (23 cases). Evidence was obtained that in the majority of brain wounds infection develops in the superficial layers of the wound and spreads thence to the deeper layers.

Penicillin was applied locally to a series of 23 brain wounds 72 hours old, or older, with encouraging results.

## BIBLIOGRAPHY

- Abraham, E. P., Chain, E., Fletcher, C. M., Florey, H. W., Gardner, A. D., Heatley, N. G., and Jennings, M. A. (1941). *Lancet*, 2, 177.  
 Ascroft, P. B. (1941). *British Medical Journal*, 1, 739.  
 — (1943). *Lancet*, 2, 211.  
 Bakulov, A. N. (1943). *Moscow News*, Feb. 27.  
 Botterell, E. H., and Jefferson, G. (1942). *British Medical Journal*, 1, "S1."  
 Cairns, H. (1941). *J. R.A.M.C.*, 76, 12.  
 — (1943). *British Medical Journal*, 1, 313.  
 — Eden, K. C., and Schorstein, J. (1943). *Investigations concerning the Use of Penicillin in War Wounds*, H.M. Stationery Office, London.  
 Cushing, H. (1943). *Brit. J. Surg.*, 5, 558.  
 Eden, K. C. (1943). *Lancet*, 2, 659.  
 Kadin, I. S. (1943). *Voprosi Neurochirurgii*, 2, 61.  
 McKissock, W., and Brownscombe, B. (1941). *Lancet*, 1, 593.  
 Report by a Committee of Soviet Scientists (1943). *British Medical Journal*, 1, 785.  
 Schorstein, J. (1944). *Lancet* (in the press).  
 Sorgo, W. (1942). *Zbl. Neurochir.*, 7, 73.  
 Tönnis, W. (1942). *Ibid.*, 6, 113.  
 Watt, A. C., and Alexander, G. L. (1942). *Lancet*, 1, 493.

## BURNS AND SCALDS IN CHILDREN

### AN INVESTIGATION OF THEIR CAUSE AND FIRST-AID TREATMENT

BY

A. W. WILKINSON, F.R.C.S.E.

(From the Royal Hospital for Sick Children, Edinburgh)

In spite of a significant reduction in the gross numbers of deaths from burns and scalds under modern methods of treatment, the mortality rate in young children remains relatively high, even when efficient treatment is provided at an early stage. During the past three and a half years there has been an increase in the incidence of burns and scalds in the Edinburgh district, which has aggravated the coincident reduction in the number of available hospital beds. It has long been recognized that burns and scalds as they affect children are largely domestic accidents, and the most hopeful means of securing a further reduction in the number of deaths is by avoiding those conditions which are known to favour the occurrence of thermal injuries. During the period June 1, 1938, to July 31, 1942, 366 children suffering from burns and scalds were admitted to the Royal Hospital for Sick Children, Edinburgh. This report is based on the information obtained regarding the injuries sustained by these children, and is presented in the hope that interest will thereby be stimulated in the social aspects of the problem of burns and scalds, and that suitable preventive measures will be taken.

## Causal Agent

Table I gives a list of the agents causing the injury, and indicates that these accidents are almost entirely of a domestic nature. The commonest cause was the upsetting of a cup of tea. The average age in this group was 18 months, and usually the child was being nursed on the lap within easy reach of the tea-cup; sometimes the adult was holding both child and cup when the accident occurred. The injury thus produced is characteristic, usually involving 5 to 10% of the body surface, the commonest sites being parts of one side of the face, neck and chest, one shoulder and arm. Similar but more extensive injuries resulted from the upsetting of kettles (59) or teapots (43): most of these were due to nursing children in close proximity to the table, but a number resulted from the child upsetting a teapot or kettle on a stove, a hob, or a gas-ring on the floor. Saucepans (63) were often on the floor or, when on a fire or stove, the projecting handle was grasped by the child. A child, 2 years of age, fell and sat in a frying-pan placed on the floor. Some of the children who fell into washtubs or baths were just at the toddling stage and lacked proper supervision when in wash-houses and outhouses, and as a rule such injuries were extensive.

The burns fell into 3 groups. The most serious as regard extent and prognosis were those in which the child's clothes

were ignited; 6 out of 30 such patients died. This type was most common in girls, often being due to the hem of a nightgown or skirt becoming ignited as the child reached for the mantelpiece or stood too close to an unguarded fire. Some were the result of the child, or other children, playing with matches. Burns due to contact with fire-bars or hot grates were usually small in extent but deep in degree, and some occurred in spite of a fire-guard; one child, aged 16 months, climbed the fire-guard while unattended

TABLE I

Agents causing Burns and Scalds	Number of Patients	Died
Cup of tea (includes 3 coffee, 3 cocoa)	91	1
Teapot .. .. .	43	1
Kettle .. .. .	59	3
Saucepans and other cooking utensils	63	—
Plates of hot food .. .. .	9	1
Fall into pail of hot water, hot bath, wash-tub, boiler, etc.	20	2
Fireplaces, etc. .. .. .	25	—
Clothing set on fire .. .. .	30	6
Lighted paper, celluloid combs, etc.	9	1
Burst rubber hot-water bottle	5	—
Burst boiler .. .. .	2	—
Poultices .. .. .	3	1
Stood in quicklime .. .. .	1	—
Sunburn .. .. .	1	—
Car accident .. .. .	1	—
Baby born into pail of hot water .. .. .	1	1
Feet bathed with boiling water .. .. .	1	—
Placed on "chamber" containing boiling water	1	—
Cause unknown—"came home burned" ..	1	—
Burns .. .. .	68 (18.6%)	7 (10.3%)
Scalds .. .. .	298 (81.4%)	11 (3.7%)
Totals .. .. .	366	18 (4.9%)

and fell against the bars of the grate, and another, aged 2 years, was burned while playing with a gas-oven. In the third group, the burn, usually of small extent, was due to the ignition of celluloid combs or similar articles when the child, tiring of them as playthings, poked them into an easily accessible fire; these were serious in that the hands were often the parts most badly affected. The miscellaneous causes call for little comment; 3 out of 17 such patients died.

In the case of patients living within the boundaries of the city of Edinburgh an attempt was made to relate the circumstances of the accident to the home conditions and the geographical situation of the house. This has shown that the incidence is high in certain areas of the city where population is dense. The cases are concentrated in parts of the Old Town and in some parts of the newer municipal housing estates built on the outskirts of the city. This latter observation is important, as it appears to indicate that bad accommodation is not so prominent a factor as the domestic habits of the family. In some families more than one child had been scalded or burned on various occasions, and a few children had been injured more than once. The lives of the parents of these children are hard; families are often large, and it is all too common for the younger children, aged up to 5 years, to be left in the charge of other children only a few years older. This aspect of the problem has become increasingly important with the present difficulties in shopping, part- or whole-time work, etc.; and is not always relieved by such measures as have been introduced for the partial care of children, since many parents are unwilling to depute the care of their children.

#### Time Incidence

In 132 cases of the present series there was a record of the time of day at which the injury occurred (see Chart). The peak

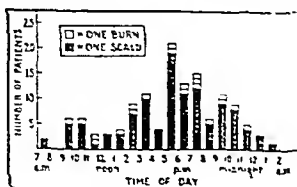


Chart showing time incidence of injury (132 cases)

was reached in the early evening between 5 and 7.30 p.m., which is not unexpected. There were surprisingly few during the morning, but an unduly large number between 9 and 11 p.m. The occurrence of scalds in young children at midnight and 1 a.m. is noteworthy.

Burns and scalds are common during the winter months, but in examining a large series of over 800 cases it was found that admissions might reach an unusually high level in a particular month without relation to the season and for no evident cause. Table II is of interest in showing that the incidence in the last two months of 1939 and the first two months of 1940, when compared with that in the same four months in the previous five years, was found to be nearly twice as great. These numbers have since declined, but are still 40% above the pre-war level.

TABLE II.—Number of Children suffering from Burns and Scalds seen at Surgical Out-patient Department per Month (1934-42)

	1934-5	1935-6	1936-7	1937-8	1938-9	1939-40	1940-1	1941-2
Nov. ..	12	16	10	12	9	22	14	13
Dec. ..	11	15	12	12	20	24	14	22
Jan. ..	12	9	16	12	11	29	28	20
Feb. ..	16	5	16	15	11	22	15	15
Totals	51	45	54	51	51	97	71	70

This increase appears to be associated with the abnormal social conditions existing during these months of 1939-40: such as the closing of schools, cinemas, and other places of entertainment and the lack of recreational facilities, the "black-out," and a reduction in amount and quality of parental supervision of children, due to mental unrest, preoccupation of various kinds, and additional war work.

#### Age Incidence

In Table III the number of patients and deaths, and the mortality rate at certain ages, are shown. Most injuries occurred in the second year of life: 70% of the patients were less than 3 years and 88% less than 5 years of age. The mortality rate was high in the first, fourth, and fifth years; in the first year fatal injuries were often of small or moderate extent (5, 5, 5, 10, 20% of body surface), while in the fourth and fifth years they were usually extensive (10, 25, 45, 50, 50, 60, 65% of body surface). In the first year all were scalds; in the fourth and fifth years only two were scalds.

TABLE III

Age Group (Years)	Total Patients	Total Died	Burns		Scalds	
			Total	Died	Total	Died
0-1	45	5 (11.1%)	7	0	38	5
1-2	147	4 (2.7%)	24	1	123	3
2-3	65	1 (1.5%)	9	0	56	1
3-4	38	4 (10.5%)	8	3	30	1
4-5	26	3 (11.6%)	7	2	19	1
5-12	45	1 (2.2%)	13	1	32	0
0-12	366	18 (4.9%)	68	7	298	11

Further evidence on age incidence in children has been obtained from the Reports of the Registrar-General for Scotland, which show that in the years 1931-8, inclusive, 493 deaths, or 40.9% of deaths at all ages from burns, occurred in children of 5 years or under; of the 18 children of the present series who died 17 were aged 5 or less. The only significant difference in incidence between the two sexes was between the ages of 1 and 3 years, when males predominated (136 males, 76 females); the totals for all ages (up to 12 years) were 211 males, 155 females.

#### Extent of Injury

Thermal injuries may be classified according to their extent, site, and depth. In children the most important of these criteria is extent, since the ratio of surface area to body weight is highest at birth and decreases approximately as weight increases, and the systemic disturbances are usually related fairly closely to the extent of the injury. The danger of certain complications is greater in deep than in superficial burns and in burns affecting the flexures and the neighbourhood of orifices, and these factors were taken into consideration in deciding whether or not to admit patients. Comparison with previous series in regard to extent of injury is difficult, but it is the opinion of surgeons who have treated such patients for many years that more injuries of small extent are now treated in the in-patient department than was formerly the case.

From Table IV it will be seen that in 303 of 366 patients admitted the injury involved 15% or less of the body surface; most

patients—with lesions of less than 5%—were admitted because of the dangers of complications due to site or depth of the lesion, and none of this group of patients died. Of 244 patients with injuries of 5 to 15% of body surface, 6 died (1 of shock, 5 at later stages); of the remaining 63 patients 12 died (8 of shock, 4 at later stages). As the extent of injury increased so did the mortality rate, but the number of patients diminished. The importance of shock as a lethal factor is closely related to the extent of injury.

TABLE IV.—Extent of Injury in Relation to Mortality

Area (%)	Number of Patients	Deaths (No. Cases)	Shock	Mortality Rate (%)	
				All Cases	Shock
Less than 5	57	0	0	0.0	0.0
5-15	244	6	1	2.4	0.4
15-45	54	12	8	22.2	14.8
50-100	9	8	7	88.9	77.8

## First-aid Measures

Information was obtained in 265 cases regarding the first-aid treatment given by parents, relatives, neighbours, passers-by, or medical practitioners. In some cases more than one method had been used. One patient had been treated with four different medicaments—namely, cod-liver oil, flour, and baby powder to the raw surface, and castor oil internally. Another had been dressed with cotton oil, white of egg, and tannic acid jelly. The 116 substances used on 242 patients are listed below; no first-aid treatment was given to 23 patients.

Substances used at first aid on 242 Patients

Substance	Number of Patients
Olive oil	50
Various tannic acid jellies	5
Picric acid	45
Dry cloths, etc., etc.	7
Flour	10
Cotton oil	10
Onion juice	10
Castor oil by mouth	14
Flaxseed emulsion, etc.	8
Baking soda	6
Vaseline	6
White of egg	5
Butter	3
Syrup of figs by mouth	1
Cloth soaked in tea	1
Talcum powder	18
Starch	1
Cod-liver oil	1
Eucalyptus	1
Cold water	1
Soup	1
Glycerin	1
Milk	1
Vinegar	1
Calamine lotion	1
T.C.P.	1
Bone powder	1
Total applications	516
No first aid	23

The popularity of olive oil is an important factor, since, if a coagulant or other agent in a watery solution or base is subsequently to be used in the treatment of the raw surface, all the oil must be removed from the burn and adjacent skin, involving prolongation of local treatment and increased trauma to the raw surface. Oily and greasy substances do not appear to reduce the loss of plasma from the raw surface to an appreciable extent, and in some cases their application caused more pain than the initial injury. A variety of tannic acid jellies were used, but in no case was such treatment properly carried out. The commonest faults were the use of hopelessly inadequate amounts of jelly, resulting in the treatment of only part of the affected area, and the failure to cleanse the affected area before applying the jelly. For example, scalds due to the spilling of a cup of tea commonly extend on to the scalp and are always more extensive than they at first appear; before such injuries can be cleansed the hair must be shaved, and in the absence of this precaution infection is invariable. Picric acid is still frequently employed, in spite of the danger of liver damage which is known to be associated with its use. Twenty-three patients did not receive first-aid treatment; most of these were brought to hospital within a short time of injury, and no adverse effects were noticed in these cases. The use of baking soda is based on the common belief that it is soothing; flour and oils are thought to exclude the air. It is widely believed, among the older members of many of the families from which these children came, that a dose of castor oil helps to

"put away" shock following a variety of injuries, including burns and scalds. The dose varied, but as a rule the oil was vomited and purging seldom resulted; syrup of figs was also used for this purpose if castor oil was not available. Most of the remaining heterogeneous collection of substances represented all that was obtainable in the circumstances, applied without respect to action or value. Patients whose injuries had been covered only with a dry cloth or dressing were in a better state on admission than those with comparable injuries which had been treated with the wealth of the domestic pharmacopoeia.

## Discussion

Dr Quincey, writing in Edinburgh about a hundred years ago, stated that "three thousand children per annum—that is, three hundred thousand per century; that is (omitting Sundays), about ten every day, pass to heaven through flames in this very island of Great Britain." In a footnote he adds: "Their deaths are chiefly through the carelessness of parents." In spite of considerable advances there is still room for improvement. Donald (1930) reported a steady decrease in the number of children admitted and in the mortality rate at the London Hospital between 1899 and 1920. On the other hand, Wilson (1932) stated that in the Royal Hospital for Sick Children, Edinburgh, the incidence and mortality rate remained fairly steady during the period 1899-1920, but since 1920 the number of admissions had risen steadily, though the mortality rate had fallen. A possible explanation of this increase may be the rehousing of families from the Old Town in the new municipal housing estates at the periphery of the city, which began in 1922. This has resulted in a reduction in the number of patients treated at the dispensaries (Table V). It will be noticed that burns and scalds in children represent 5.6% of all new patients treated, and that this figure has remained remarkably constant in spite of the fall in attendance, indicating that the incidence of these injuries remains much the same in those areas of the city (chiefly the Old Town) served by this dispensary.

TABLE V.—Out-patient Attendances at a Dispensary

September to August	Total Out-patients	Burns and Scalds in Children
1936-7	2,034	112 (5.5%)
1937-8	2,104	106 (5.0%)
1938-9	1,487	90 (6.1%)
1939-40	1,299	69 (5.3%)
1941-2	1,705	102 (6.0%)
1942-3	944	60 (6.4%)
1943-4	793	37 (4.7%)
Total	10,219	576 (5.6%)

In the present series of children up to 12 years of age the burn-scald ratio is 1.4, as compared with Mitchiner's (1933) figures of 1.7 in 1933 and 3.2 in 1899. It is questionable whether the steady fall in the number of burns since 1899 which Donald reported has been contributed to by the Children's Act, 1908, to such a large degree as he believes. It seems equally probable that changes in environment in respect of fewer gas-lights, oil lamps, and open fires, greater provision for recreation and entertainment outside the home, and improvement in housing conditions have been the important factors. Of deaths at all ages from burns and scalds, 40% occur in children under 5 years of age. In this series 88% of 366 children under 12 years of age were less than 5 years old, and Donald's figures show that 86% of the 1899-1903 group and 88% of the 1924-8 group of children under 12 years of age were less than 6 years old. While the total number of burns and scalds at all ages may have declined, the proportion in children under 5 years of age remains the same. In the present series nearly all the injuries were due to domestic accidents arising out of a combination of the inquisitive and acquisitive instincts, lack of painful experience, carelessness and thoughtlessness of young children, together with inadequate supervision and failure to take preventive measures on the part of parents or responsible elders; actual neglect was extremely rare. These injuries were most common under cramped conditions in the poorer districts, but occurred also in small families living in uncrowded homes.

The limit of the degree to which the gross mortality rate in children can be markedly reduced by therapeutic measures is now being approached. From the evidence which has been cited



there is no doubt that nearly all these injuries can and should be prevented. To this end the following suggestions are made:

1. Intensive propaganda by posters exhibited in public conveyances, hospital and clinic waiting-rooms, schools, and cinemas. Such propaganda should give information as to the number of burns and scalds per year, with mortality rates; and a description, with diagrams, of the ways in which the accidents occur, how they may be prevented, what first-aid treatment should be applied, and where further treatment may be obtained.

2. Closer co-operation between hospital staffs and the social services. All such accidents involving children should be notified to a statutory or voluntary organization dealing with the welfare of children, or to the hospital almoners. The house concerned should be visited within 48 hours by a trained social service worker—preferably a woman—who would inquire into the circumstances of the accident, give advice regarding the prevention of a recurrence, and make a confidential report to the hospital or organization.

There are few, if any, circumstances more distressing than those attending the burning or scalding of an infant or young child. At once all is confusion and concern. While recognizing the difficulties and stress under which home treatment is carried out, the methods that had been employed in this series call for comment. The state of the injuries to which various types of coagulant jellies had been applied was creditable neither to the person who applied the treatment nor to the jelly concerned. When used properly on a suitable case such jellies may be valuable and efficient agents, but their employment by those not conversant with the indications for their use and with their inherent dangers is to be discouraged. A recommendation that the patient be removed to hospital without any form of local first-aid application may be thought callous, but it cannot be too strongly stressed that first-aid treatment of the kinds commonly found in this series is unnecessary, meddlesome, and almost invariably harmful. The guiding principles are two: the treatment of shock already present, and the prevention, so far as is possible, of further shock; the latter implies protection of the raw surface, but not its over-medication. Both principles can be followed by interfering as little as possible with the patient and the lesion. The details of first-aid treatment have been fully stated in E.M.S. Memorandum No. 7, Department of Health for Scotland, 1941.

#### Summary

A review has been made of 366 children up to 12 years of age, suffering from burns and scalds, who were admitted to the Royal Hospital for Sick Children, Edinburgh, from June 1, 1938, to July 31, 1942, with special regard to the social aspect of the injuries.

The circumstances of the accident, including the time of day, causal agent, age of patient, and the extent of the injury, have been analysed. The results of these analyses, combined with the geographical and social distribution within the area served by the hospital, show that the problem of burns and scalds is primarily a social one, which, it is believed, can best be solved by suitable educative propaganda directed to that part of the community most affected.

The first-aid treatment given to these patients was also examined; in the great majority of cases it had been badly done or was of an undesirable nature.

The mortality rate in this series of 366 burns and scalds was 4.9%.

#### REFERENCES

- Annual Reports of Registrar-General for Scotland, 1931 to 1938. H.M. Stationery Office, London.  
Donald, C. (1930). *Lancet*, 2, 949.  
E.M.S. Memo. No. 7 (1941). Dept. of Health for Scotland, H.M. Stationery Office, London.  
Mitchiner, P. H. (1933). *British Medical Journal*, 1, 447.  
Wilson, W. C. (1932). *Practitioner*, 129, 183.

Standard rates of pay for all nurses in mental hospitals and institutions in Scotland are recommended by the Scottish subcommittee on nurses' salaries, and the general effect is to increase salaries by 4s. or 5s. a week, thus bringing pay and also conditions of service generally into line with those in England. The starting salary of male nurses will be £2 18s. a week, rising to £4 11s. 6d. as charge nurses; the rates for women are 11s. less. There is to be an additional 4s. a week for nurses on night duty, and a standard working week of 48 hours is suggested, except in the Royal Asylums, where, in accordance with practice, the standard week varies between 48 and 54 hours. Nurses in mental institutions will receive a cash payment of £2 10s. on passing the preliminary examination and £5 on passing the final. Annual leave is to be 21 days. It is hoped that the new scales will result in increased recruitment of nurses for mental hospitals, where training is given not only for the State Register examination but also for the certificate of the Royal Medical-Psychological Association.

## HEAT IN THE TREATMENT OF SHOCK.

BY

ANDREW W. KAY, M.B.Glas., F.R.C.S.Ed.

Hall Tutorial Fellow, University of Glasgow

The application of heat has become fully established as a cardinal principle in the treatment of traumatic shock. It has been believed to exert a favourable influence, mainly by relieving the cutaneous vasoconstriction and thus augmenting the venous return. The possibility that the cutaneous vasoconstriction is a compensatory mechanism and that heat may be harmful has only recently been entertained.

To assess the value of heat in clinical cases of traumatic shock is difficult, for the level of shock is influenced by many variables which cannot be controlled. It seemed useful therefore, to investigate the effects of heat, as usually applied in the treatment of shock, upon normal subjects. This report relates to such an investigation carried out upon healthy adults exposed to heat under a "heat cradle." While the results cannot properly be regarded as applicable to shock, they do at least suggest that the value of heat in shock deserves further critical assessment.

#### Experimental Method

Subjects used in this investigation were young adult male who were either convalescent from minor surgical procedure or were awaiting such operations as herniorrhaphy or excision of haemorrhoids. Observations made were: (1) arterial blood pressure; (2) venous blood pressure; (3) pulse rate; (4) oral temperature; and (5) the patient's clinical condition.

The venous-pressure apparatus employed consisted of a No. 19 intravenous needle fitted to a three-way stopcock. This stopcock is connected at one inlet to a reservoir of normal saline and at its other inlet to a manometer of 4 mm. calibre. Venous blood pressure is therefore recorded in millimetre of saline solution. Zero was arbitrarily set at the level of the manubrium sterni. When the apparatus is in use repeated observations can be made, and between these readings a continual drip of saline prevents clotting within the needle. By this method the normal range was found to be 60 mm. to 80 mm. of saline solution and the average resting venous pressure in 40 young adults was 69.5 mm. At least five minutes must elapse after venepuncture before readings can be accepted as being reliable.

Heat was applied by means of the hot-air cradle for one hour, the temperature varying between 38° and 40° C. Observations were made before the application of heat, at ten-minute intervals during its application, and for 40 minutes thereafter. To bring the experiment into line with the treatment of shock, normal saline was administered intravenously to 10 subjects in amounts ranging between 200 and 1,200 c.cm. In 5 other cases plasma was administered intravenously in amounts ranging from 250 to 700 c.cm.

#### Experimental Findings

The record of Case 5 is given in detail (see Table), with a graphical record (Chart I). The combined records of all cases are shown in Charts II and III. Mean curves are used in place of tables, and it is to be noted that the curves of individual cases approximate closely to the mean.

Certain constant changes were observed: (1) a progressive fall in arterial blood pressure; (2) a rise in venous blood pressure; (3) a rising pulse rate; and (4) a rise in oral temperature. In addition to these findings, however, the most striking observation was the effect of the hour's exposure to heat on the patient's general condition. Three experiments had to be abandoned owing to the severity of symptoms and the resulting anxiety expressed by the patient. In these cases headache, nausea, and exhaustion were prominent symptoms. Flushing was evident before the termination of the period of exposure to heat in every case. Frontal headache was common, and frequently lasted from 12 to 24 hours after the end of the experiment. In 9 cases symptoms of dehydration were present in varying degree—viz., dry tongue, weakness and thirst. In all cases general perspiration was noted. In 6 cases nausea was present, and vomiting occurred in two of these. Other symptoms were abdominal discomfort, muscular

pains and exhaustion. These subjective effects were not prevented or lessened by concomitant intravenous administration of saline or plasma.

### Discussion

It is not the purpose of this paper to give a detailed explanation of the circulatory changes observed. It is suggested, however, that the essential factor is a general peripheral dilatation. This is borne out by the flushing of the face and trunk which was observed in every case. This peripheral dilatation results in a diminution of the pressure gradient between the arterial and venous sides of the circulation. A lowering of the arterial blood pressure and a rise in venous

TABLE I.—Detailed Record of Case 5.

Time Mins.	Pulse Rate	V.B.P. (mm. Hg.)	A.B.P. (mm. Hg.)	Oral Temp. (°C.)	Clinical Notes
0	50	73	130.75	38.2	
10	53	75	130.75	38.2	Heat on. Temp. under cradle 38° C.
20	52	70	126.75	—	
30	56	65	120.75	38.3	Patient feels very warm
40	56	63	120.75	38.5	Perspiration on trunk
50	60	55	118.75	38.5	Perspiration on forehead
60	63	96	116.65	39.0	Complaints of frontal headache
70	66	104	115.65	39.3	Face flushed. Heat off
500 c.c.m. of saline given intravenously during this hour of exposure					
80	63	100	115.15	39.3	Tongue dry; thirst
90	58	95	120.70	39.2	Sensation of nausea
100	55	85	120.70	39.0	
110	56	85	122.70	38.8	No change in symptoms; headache for 12 hours. Feeling of exhaustion persisted for 5 hours

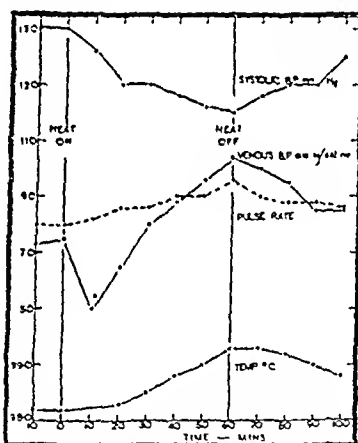


CHART I.—Record of Case 5.

blood pressure are so produced. The increase in pulse rate occurred in all subjects quite independently of their excitability. It may be a direct result of increased pressure on the right side of the heart reflexly producing a rise in heart rate (Bainbridge, 1915).

It is considered that the result of this study shakes the confidence which has for so long been placed in heat therapy for patients suffering from traumatic shock. In the normal subjects, investigated definite evidence of dehydration occurred after exposure despite the concurrent administration of intravenous fluid. This is not consistent with the aims of treatment for patients already suffering from the effects of fluid loss.

No one has defined adequately the term "shock," although many have their own conception of this complex clinical entity. Most, however, will concede that a lowered arterial blood pressure is present in all but a small minority of cases. These experiments have revealed a constant and progressive lowering of blood pressure when normal subjects were exposed to the hot-air cradle. Most accepted forms of treatment aim at raising blood pressure, and so, for this further reason, prolonged heat must be regarded as harmful.

It is also recognized that in shock there exists arteriolar constriction (Meek and Eyster, 1921). This is primarily a compensatory mechanism. The flushing which was observed so constantly after application of heat indicates peripheral dilata-

tion. In addition to overthrowing the compensatory mechanism this leads to increased fluid loss by capillary filtration, and thus adds to the state of dehydration which already exists and which has been augmented by perspiration.

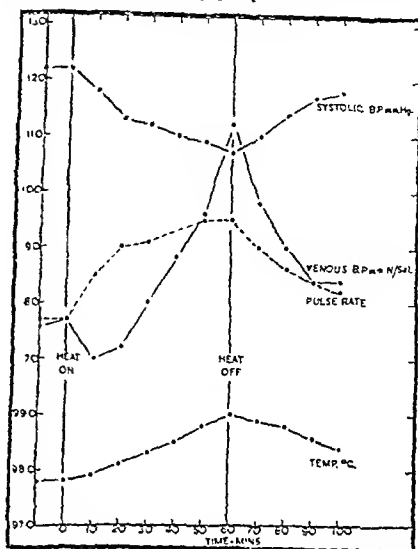


CHART II.—Mean curve of 10 cases receiving saline intravenously.

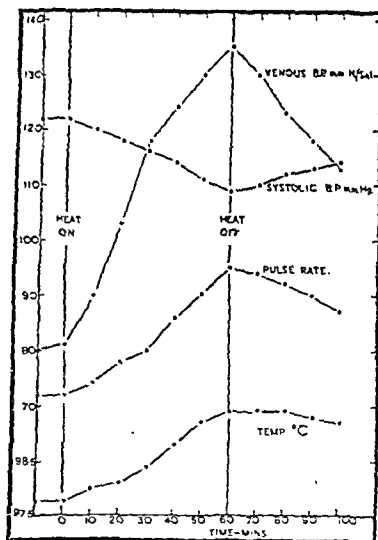


CHART III.—Mean curve of 5 cases receiving plasma intravenously.

### Summary

Fifteen normal subjects were exposed for one hour to the hot-air cradle. Intravenous saline was administered to 10 of these, and intravenous plasma to 5.

A progressive rise in pulse rate and venous pressure, together with a progressive fall in arterial blood pressure, was observed in all cases. Symptoms resulted, including nausea, vomiting, dehydration, headache, perspiration, muscular pains, and exhaustion. In certain cases these were severe.

These findings would appear to contraindicate the prolonged use of heat in the treatment of patients suffering from traumatic shock.

I wish to express my grateful thanks to Prof. C. F. W. Illingworth and Prof. Noah Morris for their encouragement and helpful criticism. This work was done while in receipt of a grant from the Medical Research Council.

### REFERENCES

- Bainbridge, F. A. (1915). *J. Physiol.*, 50, 65.  
Meek, W. J., and Eyster, J. A. E. (1921). *Amer. J. Physiol.*, 55, 1.

INFLUENZA "A": AN ACCOUNT OF A MINOR  
EPIDEMIC

BY

T. H. DONNELLY, M.B., B.S.  
Flight Lieut., R.A.A.F.H. P. HUGHES, M.B., Ch.B.  
Flying Officer, R.A.F.V.R.D. ROBERTSON, M.B., B.Ch.  
Flying Officer, R.A.F.V.R.

AND

ELLIOT PHILIPP, M.A., M.R.C.S.  
Squadron Leader, R.A.F.V.R.

On March 30, 1943, a Canadian airman went sick with symptoms corresponding to those known to the lay public as "influenza." He was tired and had slight cough and headache; eye movements were painful and he felt hot and then shivery. On examination his temperature was 102° F., pulse 84, and respirations 18. There was slight pharyngeal inflammation, but no glandular enlargement or nasal catarrh; lungs, heart, and all other systems were normal. He was put to bed. His temperature remained above 101° F. for 36 hours, and then dropped to normal. The patient was fit for discharge within four days of admission.

On April 3 an English officer reported sick with similar symptoms and signs. No special investigations were made, and after four days in bed he was perfectly fit again.

On April 14 an airman reported sick. Symptoms were similar to the previous two cases except for slight harshness in breath sounds at the base on the right side. Temperature was normal after 60 hours in bed. On the third day of illness slight pain was felt in the right side of his chest; breath sounds were diminished, but temperature became quite normal. After two days, as the patient did not seem to be making quick recovery in spite of the normal temperature, he was sent to hospital for x-ray, which showed tuberculous infiltration in the right apex, and this result was confirmed by tuberculosis-positive sputum.

On April 16 a W.A.A.F. reported with a temperature of 101° F. She had headache, a slight cough, and a sore throat. Put to bed, she recovered in three days. On the next day an airman reported with similar signs and symptoms, which also cleared in three days; but from that date cases occurred in increasing numbers, as shown on the graph of incidence of the epidemic (Fig. 1). Ten cases were reported on April 21;

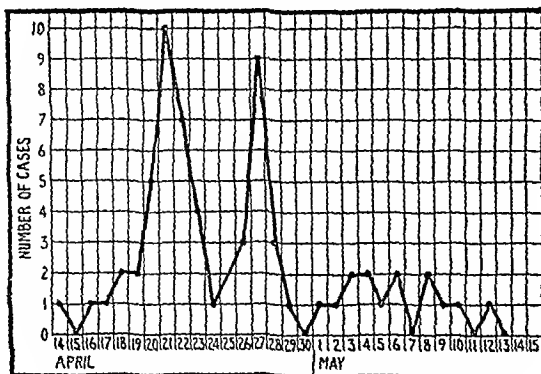


FIG. 1.—Curve of incidence of the epidemic.

it then appeared obvious to us that an epidemic of a virus infection was occurring, and it seemed likely that the infection might be one of true influenza. Investigations were carried out, and on April 23 some of the 30 patients then in bed were picked out at random for (1) chest radiography; (2) differential blood count; (3) throat swab; (4) blood culture; (5) sputum examination; (6) titrations of antibodies in blood against influenza viruses A and B.

By this date the patients being admitted had much severer symptoms and very definite signs. They felt too ill to report sick, and several were found lying on their beds in their quarters feeling very poorly. In most cases headache was

severe; there were slight soreness of the throat, nasal catarrh, and some nausea. There was much sweating with shivering between times, and also a variety of severe signs and symptoms which we discuss below.

On examination temperatures were found to be between 102° and 103° F.; the eyes were very red and the faces flushed, suggestive of early morbilli, with, in some cases, enlargement of cervical and submaxillary glands. Tongues were furred, pharynges injected (but with no membrane) and in some cases of a violaceous tinge. In the chest, post-tussive "sticky" crepitations were heard in all arcs. Breath sounds were harsh and vesicular in type, with prolonged expiration. Low backache was a feature of most cases. The urine was normal except for traces of albumin in one or two cases. Of the 12 chests x-rayed, seven had no abnormality. Only one showed marked congestion with some consolidation at the right base.

The differential white blood cell count in a typical case was: total white cells, 5,300 (polymorphs 71.5%, lymphocytes 23%, monocytes 5%, eosinophils nil, basophils 0.5%). The highest total white cell count was 7,600 (polymorphs 54.5%, lymphocytes 31.5%, monocytes 12%, eosinophils 1%, basophils 1%). Throat swabs in most cases showed moderate growths of pneumococci, *Strep. viridans*, *N. catarrhalis*, or *Strep. haemolyticus*. Blood cultures revealed nothing. Sputum examinations disclosed little of interest, except in the case with tuberculosis.

Titrations of antibodies against influenza viruses A and B by the Hirst method (inhibition of the agglutination of fowl red cells by influenza virus) gave these results:

Case	Sample	Virus	
		A	B
1	I	1/32	1/32*
	II	1/192	1/64
2	I	1/48	1/16*
	II	1/384	1/32
3	I	1/256	1/96
	II	1/256	1/96
4	I	1/96	1/64
	II	1/128	1/32
5	I	1/128	1/32*
	II	1/1024	1/32
6	I	1/64	1/16*
	II	1/1024	1/16

\* In each case blood sample I was taken within two or three days of the onset of the disease, and blood sample II about 14 to 20 days later.

Dr. C. H. Andrewes, F.R.S., of the Medical Research Council, under whom Miss K. C. Mills so kindly did the tests, reported: "No case showed a significant change in antibody level against B, whereas four showed a good rise against A. (These have been marked with an asterisk.) As to the diagnosis of Cases 3 and 4, it has been noticed in numerous outbreaks, both in the United States and over here, that cases giving no evidence of infection with influenza A virus turn up in the same outbreak as virus A infection. It has been suggested that when influenza hits, as it sometimes does, a patient who already has good A antibodies the infection may cause no further rise. This may have been the case with Case 3." Dr. Andrewes (1942) has discussed the question in an address.

On April 24 only one case was admitted, but April 27 brought the "crest" of the second wave of the epidemic. Cases admitted after that date became progressively less severe, and only one or two were admitted after May 12.

## Discussion

Although only 68 cases actually reported sick it is known that there were many airmen who felt "a bit off colour" during the period of the epidemic and who probably suffered from a "subclinical" attack of influenza A. Of our severe cases, one patient showed chest complications at a very early stage, although by portable x-ray findings no pneumonia was actually present. Clinically his case seemed to be quite a definite pneumonia, and was treated as such. Another patient showed as his first severe sign marked and persistent irregularity of the heart rhythm. He was treated with "absolute rest" for three days, at the end of which time normal rhythm without adventitious signs had been re-established. Severe low backache was experienced by two or three patients, and had there not been an epidemic of influenza this might easily have

been mistaken for a renal condition. We would like to point out that had we seen the case with the bad chest or the case with irregularity of the heart or those with the very severe backache at any other time than during an obvious epidemic we would have sent them into hospital under varying diagnoses, and thus almost certainly have spread the epidemic.

We consider that the period of incubation is between 24 and 48 hours, but it may be as high as 96 hours.

### Treatment

All patients were placed on a fluid diet on the first day of the disease and all received diaphoretic mixtures. The diet was increased each day, and the diaphoretics were continued until the patients were fit to leave bed. Cough, where troublesome, was treated with a codeine linctus.

Sulphapyridine treatment was resorted to for all patients whose temperature had risen above 103° F. The dosage was 2 g. as an initial dose and 1 g. four-hourly. No patient had more than 8 g., and the temperature was normal in each case before that dosage had been taken. It did appear as though the sulphapyridine had definitely assisted the drop in temperature. The literature gives conflicting reports on the efficiency of sulphapyridine in influenza A, but it seems logical that in a disease in which the temperature is high owing to virus infection and in which most throat swabs demonstrate the presence of pneumococci or streptococci the use of sulphapyridine or some other drug of the group in severe cases is indicated.

The weakness that so many writers describe after influenza was not apparent in this series of cases, and all patients were fully fit seven days after leaving bed. These seven days were spent doing light duties only. There were no serious complications, except in the case proved to have tuberculosis. It may well be that had this patient not developed influenza his tuberculosis would not have been brought to light at the early stage at which it became apparent.

As stated by many writers, the epidemic occurred in two waves; and we noticed also that the curve of incidence of the cases was not dissimilar in shape to an average temperature curve of the severer cases (Fig. 2). It was observed, too, that

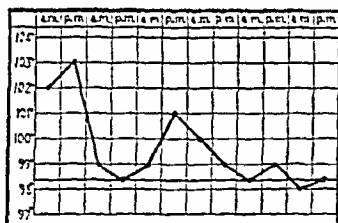


FIG. 2.—Average temperature curve.

the epidemic began in warm dry weather with a mild breeze which persisted from April 14 to April 21. The weather then deteriorated, and there was some rain; but on the 24th it improved, and became quite warm by the 26th. It may be that, somehow, the weather had no effect on the incidence of the disease, as rain fell again on April 28 or 29.

The ultimate object, of course, of the study of any outbreak is to indicate some way of preventing another occurring and, in the case of influenza, especially of preventing such a catastrophe as the 1918-19 epidemic. We can only state that, in our opinion, isolation is of the very greatest importance. Every case of even mild cold that occurs during a known epidemic should be rigidly isolated. By far the greatest proportion of our cases occurred on a satellite aerodrome, and all cases from that aerodrome were taken to the main aerodrome to be nursed in houses separated from all the other buildings on the camp. The only patients reported from the main camp after April 18 were medical personnel and ambulance drivers. Approximately half the medical personnel looking after the cases developed influenza. These medical personnel did not leave sick quarters or associate in any way with other members of the camp. It is probably for this reason that no cases occurred among the thousands of airmen on the main camp.

So far as other preventive methods go, it would certainly be worth while trying experimentally to vaccinate large bodies of men against influenza A a few months before the reckoned time (if it is possible to reckon!) when another epidemic should occur. The work of Horsfall (1939, 1941) in this connexion is especially interesting.

Sterilization of the air by ultra-violet light and propylene-glycol spray has been attempted elsewhere, but in view of our findings that wet weather coincided with the decrease in the waves of the epidemic it may be that simple moistening of the air would have some beneficial effect.

### Summary

An account is given of a small epidemic of influenza A.

Indications as to the treatment of such an epidemic when occurring on a military camp are given.

The importance of bearing in mind the possibility of influenza when certain symptoms not normally "textbook" arise, as well as the necessity for excluding tuberculosis, is stressed.

Our thanks are due to Dr. C. H. Andrewes and Dr. A. Morton Gill for the very kind advice and help given, as well as to Wing Commander Hudson, Wing Commander Church, Squadron Leader Wynroe, Squadron Leader Campbell, and our own sick-quarters staff for their great assistance.

### BIBLIOGRAPHY

- Adamson, J. D., and Fleet, R. O. (1942). *Canad. med. Ass. J.*, 46, 121.  
 Andrewes, C. H. (1942). *Proc. roy. Soc. Med.*, 35, 1.  
 — et al. (1941). *Lancet*, 2, 357.  
 DeCoursey, C., and Thuss, O. (1941). *Ohio State med. J.*, 37, 964.  
 Emdin, W. (1942). *S. Afr. med. J.*, 16, 101.  
 Gill, A. Morton (1938). *British Medical Journal*, 1, 504.  
 Hirst, G. K. (1942). *J. exp. Med.*, 75, 49.  
 Horsfall, F. L., jun. (1939). *Ibid.*, 70, 209.  
 — et al. (1941). *Ibid.*, 72, 335.  
 Lush, D., Stuart-Harris, C. H., and Andrewes, C. H. (1941). *Brit. J. exp. Path.*, 22, 302.  
 Martin, W. P., and Eaton, M. D. (1941). *Proc. Soc. exp. Biol.*, N.Y., 47, 405.  
 Price, F. W. (1941). *Textbook of Medicine*, London.  
 Smith, W., Andrewes, C. H., and Laidlaw, P. P. (1933). *Lancet*, 2, 66.  
 Stokes, J., and Henle, W. (1942). *J. Amer. med. Ass.*, 120, 16.  
 Stuart-Harris, C. H. (1941). *J. R.A.M.C.*, 77, 123.

## ESTIMATION OF HAEMOGLOBIN BY PHOTO-ELECTRIC ABSORPTIOMETERS

BY

J. M. PETERSON, D.Sc.

Lecturer in Experimental Physiology, the Physiology Institute, Cardiff

AND

D. H. STRANGEWAYS, M.A., Ph.D.

Assistant Lecturer in Histology and Embryology, University College, Cardiff

Changes in intensity of light and in the electric properties of the photo-cell have been advanced as sources of error in the estimation of haemoglobin by means of photo-electric absorptiometers (M.R.C. Report, 1943). This objection to a method which at the moment appears to offer the best means of accurate estimation of haemoglobin may be justified when it refers to absorptiometers which employ a single photo-cell and which indicate the light-absorbing power of the solution by the extent of deflection of a galvanometer. When, however, a null technique is employed with an apparatus incorporating two opposed photo-cells, error due to these changes has been found, in practice, to be eliminated. The procedure by which such error is avoidable can be simply stated without detailed description of method.

### Outline of Procedure

The concentration of haemoglobin is measured in terms of the width to which a slit has to be adjusted to pass through the haemoglobin solution that quantity of light which gives a definite output of current from the photo-cell on which the transmitted light is focused. With the light to one photo-cell passing both through the filter whose light absorption in terms of haemoglobin is known and through the adjustable slit set at the haemoglobin value of the filter, the light to the other cell is varied to give a null reading on the galvanometer. The standard filter is then replaced by the blood solution to be measured and the light adjusted by means of the slit till the null reading is again obtained. On replacing the standard filter and resetting the slit to the filter value the instrument should give the null reading. If there has

been a significant change in either or both of the photo-cells or in the light source the null reading will not be obtained, and the light to the balancing photo-cell will have to be readjusted to give a null reading before repeating the estimation. The estimation is reliable only when the null reading is obtained with the standard filter both before and after making the estimation with the blood solution.

As the standard filter and the blood solution do not necessarily transmit the same wave-lengths, it is essential, for this procedure to give accurate results, either that any change in current output from the photo-cell must be the same for all effective wave-lengths or the range of wave-length employed must be so narrow that such a wave-length difference, if it occurs, is without effect.

Our justification for claiming that changes in light intensity and in the condition of the photo-cells need not cause error is this: With an absorptiometer of the opposed-cell type using barrier-layer selenium photo-cells and NaOH-blood solutions, the reading on the instrument for a given solution is unaltered with wide differences of light intensity; further, the haemoglobin value of a solution determined immediately the photo-cells are illuminated is unchanged when redetermined after the apparatus has been in use for some hours, when the condition of the cells has markedly altered (as shown by the galvanometer deflection produced by standard illumination).

#### Some Observations

In estimating haemoglobin by photo-electric means we have made a few other observations that may be of interest. Certain advantages of the alkaline haematin method have already been advanced by Clegg and King (1942). In some ways the procedure employed in the present work differs from that of other workers. It has been found that accurate measurements can be made with NaOH-blood solutions without the necessity for either heating the alkaline solutions or forming alkaline haematin indirectly by conversion from acid haematin. 0.02 or 0.04 ml. of human blood added to 5 ml. of decinormal NaOH, estimated within five minutes, gives a value greater than 95% of the maximum. For very accurate work it is an advantage to let the solution stand overnight and to use only the supernatant liquid. There is always a slight deposit, but the supernatant liquid gives a constant maximum absorption for about five days. This rapid rate of denaturation is not necessarily true of all bloods. That of the ox, for example, requires some hours for a satisfactory equilibrium to be established.

A further advantage in the use of a strong alkali lies in the fact that while slight clotting in the pipette, which may be undetected by macroscopic examination, causes a considerable error in the absorptiometric estimation of an aqueous oxyhaemoglobin solution, the clot is readily broken down in decinormal NaOH and the supernatant fluid gives a true reading.

The region of the spectrum best suited for accurate photo-electric estimation of alkaline haematin has been investigated, employing a wide range of colour filters. A spectroscopic examination of two alkaline blood solutions, representing extremes of concentration of haemoglobin, show marked differences in light absorption in three regions of the visible spectrum—viz., (1) in the band about 600  $m\mu$ , (2) in the long-wave end about 750  $m\mu$ , and (3) in the short-wave end to about 495  $m\mu$  for the weaker solution and to about 525  $m\mu$  for the stronger. Decidedly the best results, as measured by change in photo-cell current with change in haemoglobin concentration, have been obtained in this last region using a Wratten 45A filter, which gives light transmission from 430  $m\mu$  to 540  $m\mu$ , with maximum at 470  $m\mu$  and a smaller transmission in the ultra-violet. This absorption region is not so specific for alkaline haematin as is the 600  $m\mu$  band, but the degree of change of absorption with change in concentration of alkaline haematin, as indicated by the photo-cell, is so much greater here than in the 600  $m\mu$  band, as delimited by available colour filters, that its use is justified. In estimating total blood pigment, the lack of specificity of the shorter-wave region could be significant only if one were dealing with abnormal blood containing an appreciable quantity of some pigment not convertible to alkaline haematin by decinormal NaOH. Further, in the wave-length range transmitted by the Wratten 45A colour filter the absorption by blood plasma is insignificant, as shown by the extent to which the absorption by decinormal NaOH is increased by the addition of plasma to it. In a series of experi-

ments the addition of 0.02 ml. of plasma to 5 ml. of decinormal NaOH did not, in any instance, increase the absorption by more than the equivalent of 0.1 g. Hb per 100 ml. of blood, and in some instances there was no increase. It is obvious that the plasma plays no significant part in the estimation.

The accuracy obtained in photo-electric estimation of alkaline solutions of blood is highly satisfactory. Replicates of 0.02 ml. from the same sample of blood with an oxygen capacity of about 20 ml. per 100 ml. of blood can be estimated with a standard deviation of 0.1 and with a standard error of 0.04 for twelve estimations. When 0.04 ml. of blood is used the error is less.

In the absence of an absolute standard of reference we have expressed our measurements in terms of oxygen capacity, and have found that the curve relating absorptiometer reading to relative concentrations of haemoglobin, as determined by exact dilution, coincides satisfactorily with that relating absorptiometer reading to oxygen capacities of the same relative magnitudes and determined by the van Slyke manometric method.

From the observations made it seems justifiable to claim that the reliability of the absorptiometric method of measurement here described is such that, provided the blood does not contain appreciable quantities of haemoglobin derivatives inconvertible to alkaline haematin by decinormal NaOH, the only significant errors involved in estimating the total pigment lie in the sampling (Peterson, Strangeways, and Jordan, 1943) and in the lack of an absolute standard.

#### Summary

An answer is given to the criticism that changes in light intensity and in the electric properties of the photo-cell result in unavoidable errors in the absorptiometric estimation of haemoglobin. Certain facts relating to the accuracy of the estimation are discussed.

#### REFERENCES

- Clegg, J. W., and King, E. J. (1942). *British Medical Journal*, 2, 329.  
M.R.C. Report (1943). *Ibid.*, 1, 209.  
Peterson, J. M., Strangeways, D. H., and Jordan, R. C. (1943). *J. Physiol.* 102, 5P.

## Medical Memoranda

### Staphylococcal Pyopneumothorax in an Infant: Recovery

The following case record may be thought interesting enough to merit publication.

#### CASE HISTORY

A female infant was born of a healthy mother on Dec. 14, 1942 at the West Middlesex County Hospital. The infant weighed 7 lb. 5 oz. at birth and progressed satisfactorily until Dec. 20 or breast-feeds complemented with national dried milk. On that date she developed diarrhoea, with orange stools, and vomited once. She was transferred to the children's isolation ward, where she was found to be slightly dehydrated. She seemed to make a little progress on graduated feeds (glucose-saline, dilute lactic acid milk, and expressed breast milk) until Dec. 31, when she suddenly became much worse, with watery orange stools and severe dehydration. An intra venous drip was necessary to correct the latter, and, owing to the poor oral intake of fluids, was continued until Jan. 6, 1943. By that time she had developed thrombophlebitis of the internal saphenous vein, into which the drip was running. She had a slight temperature for two days, but this subsided when the drip was stopped. She also had two septic fingers and a septic toe. She improved sufficiently to go to the breast, for the mother's milk was coming better by then. On Jan. 13 she suddenly collapsed at the breast and was found to be pale, cyanosed, and almost pulseless. Later when examination was possible, her temperature was 103° F., pulse 140, and respirations 48. The percussion note was impaired at the left base, where bronchial breathing and pleural rub were found on auscultation. A diagnosis of pneumonia was made, and the child was put in an oxygen tent and given a course of sulphadiazine (8 g in six days).

During the next week the temperature subsided but did not reach normal, and the respiration rate increased. On Jan. 21 slight oedema of the legs was noticed. By the next morning the oedema was so gross that the legs looked like sausages, and the body wall was also dropsical. On examination of the chest the respiratory excursion were found to be minimal, respiration rate 60, heart sounds muffled at the left base and accompanied by harsh crepitations. The apex beat could not be located. A radiograph (portable) revealed gross displacement of the mediastinum, which was bowed out almost into the right axilla. It was thought that this bowing might have kinked the inferior vena cava, thus causing the oedema of the legs.

The child's appearance at this time was ghastly, with half-closed upturned eyes, greyish pallor, scarcely perceptible thoracic movement, a grossly distended abdomen, and swollen legs. The chest was needled at 9 p.m. on Jan. 22 and air rushed out under pressure. About 50 c.cm. was withdrawn. The oedematous legs were scarified and wrapped in sterile dressings. Next morning there was no oedema, nor did it subsequently reappear. Re-exploration of the chest resulted in a small quantity of pus but no air. On Jan. 24 another 50 c.cm. of air and a little pus were aspirated. On the 25th about 20 c.cm. of thick greenish-yellow pus was withdrawn. From the pus on each occasion *Staph. aureus* was cultured.

In view of the large quantity of pus obtained, closed intercostal drainage was decided upon, and at 12.30 p.m. on Jan. 25 a rubber catheter was inserted by means of a trocar without anaesthesia. A considerable quantity of pus gushed out under pressure. The apparent relief was immediate, the respiration rate falling from 100 to 45 in a few minutes. Continuous underwater drainage was maintained for three days, when the pus became too thick to pass through the catheter, so a wider tube was inserted. A radiograph taken on Jan. 25 showed the return of the heart to a more normal position. By the 31st there was very little discharge, and closed drainage was replaced by a short tube draining into the dressings. Between Jan. 26 and Feb. 2, 8 g. of sulphathiazole were given and a suspension of sulphapyridine powder was instilled into the pleural cavity twice a day.

The infant was not yet out of the wood. Her respiration rate had again risen to 70-80; this was partly attributable to the gross abdominal distension, which resisted all forms of treatment, such as charcoal by mouth, pitresin by injection, and the passage of a latex-tube. The diarrhoea had by this time quite subsided, and she was taking bottle feeds of breast milk well. On Feb. 5 the temperature once more shot up to 103°. The signs suggested a left-upper-lobe pneumonia. There was scarcely any discharge from the sinus, and needling failed to reveal pus elsewhere. She was given yet another course of sulphadiazine (8 g.) and local irrigations with 1:2000 propamide b.d., but she continued to run an intermittent though subsiding temperature until Feb. 27. On Feb. 13 she was put to the breast, and later resolutely refused bottle feeds; within 24 hours she was for the first time entirely breast-fed. From that time she never looked back, and was discharged on March 8, weighing 7 lb. 12 oz. and gaining steadily. The sinus was by then completely healed.

In addition to the above therapeutic measures she received three transfusions of fresh citrated blood (450 c.cm. in all) on Jan. 25, Feb. 2, and Feb. 19. She also had a course of vitamin B injections (1 mg. daily for three weeks).

Two radiographs were taken after discharge. The first, on March 12, showed that the left costophrenic angle was almost clear, but there were signs of bilateral bronchopneumonia. She was last seen on April 2, when she was a bonny child weighing 9 lb. 9½ oz. (a gain of nearly 2 lb. in 3½ weeks), entirely breast-fed, and showing no signs of her stormy passage except the four transfusion scars, a minute scar at the site of the intercostal drain, and a scarcely perceptible radiographic shadow at the left costophrenic angle.

#### COMMENT

The pyopneumothorax in this case may be assumed to have been due to the rupture into the pleural cavity of a lung abscess, itself caused by a septic embolus. Staphylococcal lung abscesses have been reported following skin sepsis (the infant had septic fingers from the start), but a more likely source in this case was the thrombophlebitis caused by the perhaps unduly prolonged intravenous drip. The rupture of the abscess into the pleura may be assumed to have occurred on Jan. 21, when oedema of the legs appeared and the signs of respiratory distress became acute.

Features of interest in this case are: (1) the remarkable degree of mediastinal displacement, the presumed cause of the oedema of the legs; (2) the child's recovery from such a severe illness starting at the age of 1 month, when she was not yet through an attack of neonatal diarrhoea—itsself having a mortality rate of 80%; (3) the successful establishment of breast-feeding after the mother had been expressing her milk for a month the child was in the oxygen tent.

I wish to thank Dr. Cook, medical superintendent of West Middlesex County Hospital, for permission to publish this case, and Messrs. May and Baker for the supply of propamide used in irrigations. I would also like to express my appreciation to the nursing staff concerned, and especially to Sister Jones and Staff Nurse Moloney, on whom the bulk of the nursing of this exacting case depended.

PATRIA GAIRDNER, M.D., M.R.C.P.,

Assistant M.O.H., Oxfordshire County Council.

T. C. Jaleski and E. T. Morrison (*Amer. J. med. Sci.*, 1943, 206, 449), who report two cases in healthy adults, state that congenital heart block is rare, only 80 cases having been described up to 1942. The first case, which had been studied for five years, was a healthy woman, aged 20, with no cardiac symptoms and no other apparent anomalies. The second case was a woman, aged 31, who had been followed from birth and had had no cardiac symptoms except for some syncopal attacks. She had had two normal pregnancies without any serious cardiac disturbance.

## Reviews

### ALMROTH WRIGHT'S COLLECTED PAPERS

*Studies on Immunization. First Series. Researches from the Inoculation Department, St. Mary's Hospital—III.* By Sir Almroth Wright, M.D., F.R.S. (Pp. 421, 25s.) London: William Heinemann, 1943.

Some time ago (Aug. 8, 1942) we reviewed a volume containing papers written by Sir Almroth Wright during and shortly after the last war on *The Pathology and Treatment of War Wounds*. This was the first of a projected series of five republications in book form of the work of Wright and his collaborators.

Volume III is entitled, *Studies on Immunization. First Series*, and though a reprint with few changes of a book published in 1909 it actually consists of papers originally published between 1897 and 1908. There are very few living medical authors who could republish so imposing a body of work mainly carried out more than forty years ago, and fewer still, if any, who would venture to do so if they could. The earliest papers are among the most interesting, and almost unconnected with the main subject of the book; that by C. Birt and G. Lamb on the agglutinin content of the blood in what we now call undulant fever, and its variations in the course of the disease, contains much useful information. The rest, which treats of the therapeutic use of vaccines, can be looked upon in one or other of three ways.

It is certainly a convenient reassembly of historic papers, which will save the inquirer trouble in obtaining the originals; during the present scarcity of paper for more urgent scientific purposes this in itself does not seem a sufficient reason for printing such a book. The author's own view, expressed in a foreword written for this publication, is that practitioners not conversant with some of its principles are "not properly qualified to take charge of patients suffering from bacterial infections." In fact he seems to stand by his earlier pronouncements, and would presumably still advocate the treatment of tuberculosis by injections of tuberculin controlled by opsonic index estimations, as well as other forms of vaccine treatment the efficacy of which is not generally admitted. We venture to predict that few readers will accept this judgment. It would be surprising if ideas developed so early in the evolution of a young science remained fully acceptable at the present day, and, as is to be expected, adverse criticism of these papers in the light of more modern knowledge is inevitable. To cite only one example, that which represents serum treatment's vaccine treatment in disguise—it being suggested that bacterial products with which the animal has been immunized are present in the serum and are the source of its activity—cannot be taken seriously. A third way of regarding this publication is as a stimulus to more critical thought and to further investigation. We may disagree with most of it, but it would be more constructive and useful if we had something practical to offer in its stead. We can now successfully treat many acute infections, but we are very much as we were in dealing with many chronic ones. We do not know why they recur or persist in an otherwise healthy individual, in spite sometimes of a high degree of humoral immunity, or at least of every effort to produce it. The only adequate answer to the vaccine doctrine will be to expose the undiscovered factor of which it takes no account.

### ASSESSING THE FOSTER PARENT

*In Quest of Foster Parents.* By Dorothy Hutchinson. (Pp. 145, 11s. 6d.) New York: Columbia University Press; London: Oxford University Press, 1943.

Even before the war many children every year had homes found for them with adoptive parents or guardians by voluntary agencies or local authorities. The need for evacuation from the towns turned into home-finders many thousands of persons with neither experience nor knowledge. This book should have been available at that time, but its value will none the less be permanent and considerable. It fills a want which many workers in this country must have felt. Miss Hutchinson, who is assistant professor of social work in the New York School of Social Work, restricts herself to the choice and evaluation of foster parents who apply to social agencies or to social



workers for children, and to the psychology of home-finding it may affect both the worker and the foster parents. As she admits, home-finding is only one part of child placement, and knowledge concerning it should be fitted into place in the larger pattern. She rightly regards the reason of a would-be foster parent for wanting a child as a vital indication of what kind of a person he is and what kind of a foster parent he will be; her first chapter therefore deals with the wishes of parenthood and some of the chief emotional patterns that are favourable or unfavourable. She then passes to the situation of the home-finder interviewing a prospective foster mother, and the converse one in which the home-finder visits the prospective home. She gives useful warnings on the assessment of references, and much help in the difficult and sometimes painful task of refusing a foster parent. In the United States home-finding in wartime has been expanded by the needs of families whose fathers have left for military service and whose mothers have to go to work and can no longer give sufficient time to the home. It has not yet assumed the tenacity of our evacuation problems. Nevertheless much of what Miss Hutchinson says under this head is fully relevant to us, especially her emphasis on the need for trained social workers to back up the foster parents. She calls her book in a subtitle "A Point of View on Homefinding," and it is a very wholesome and down-to-earth point of view, expressed in clear and readable language. The long extracts from case material and the bibliography, characteristic of American technical literature, are definitely helpful. Every social worker who has to place children should read this book; it will give her not only some useful practical hints but several new slants on this difficult work.

### CHOLESTEROL AND THYROID DISEASE

*A Clinical and Experimental Investigation of the Blood Cholesterol Content in Myxoedema and Other Conditions.* By E. H. Stokes, Ch.M., F.R.A.C.P. Sydney: Australasian Medical Publishing Company.

This small book is the reprint of an M.D. thesis, and though it adds little that is new to the subject, it will prove a useful text for reference for those interested in either cholesterol or diseases of the thyroid gland. The author found a mean serum cholesterol level above 250 mg. per 100 c.cm. in four groups of cases—myxoedema, xanthomatosis, Bright's disease, and diabetes mellitus. Estimation of the serum cholesterol is of great value in the diagnosis of myxoedema, as the level is invariably high in untreated cases and decreases on treatment. It is a better indicator of the disease than the basal metabolic rate because it can more easily be determined satisfactorily without the co-operation of the patient. The hypercholesterolaemia of myxoedema is not due to deficiency of plasma protein, and it is more closely related to the degree of myxoedema than the depression of metabolism. Neither the mucoid infiltration nor the excess of cholesterol is affected by stimulating the metabolism by nitrophenol or nitroresol, and there is no evidence that they are related to the low blood volume, which is probably a direct effect of the fall in the metabolic rate. The rise in the cholesterol of the blood and the mucinous infiltration of the tissues are difficult to produce by ablation of the thyroid in animals or man, but this may be largely a matter of duration of the disease. Certainly both symptoms quickly respond to thyroid medication, and the blood cholesterol is low in thyrotoxicosis.

### Notes on Books

The second edition of Dr. ALFRED PINEY's *Sternal Puncture* (Heinemann; 15s.) shows a great improvement both in text and in illustrations. It provides for the student a convenient review of information which is scattered over a wide literature. It will have less appeal for the professional haematologist, who may nevertheless have to admit that Piney's somewhat informal approach does seem to appeal to the beginner. And once the student has been successfully introduced to sternal puncture, he can go on learning out of the book of Nature. The pictures of the white cells are fairly uniformly good, but those of the nucleated red cells do not really do justice to the technique and would not be a great deal of help in the actual counting of marrow films. The bibliography might have been preceded by references to some of the general reviews of sternal puncture, such as Bodley-Scott's article and Schulten's monograph, which represent the high-water mark in text and figures

respectively. More detail would also have been welcome on the technique of sternal and bone-marrow transfusion, on which Dr. Piney has written interestingly elsewhere.

Sir COMYNS BERKELEY's *Gynaecology for Nurses and Gynaecological Nursing* has reached a ninth edition (Faber and Faber; 8s. 6d.). This very useful textbook first appeared in 1910. The subject-matter has been thoroughly revised for the new edition, parts have been rewritten and many paragraphs simplified. The author in his preface says he has always taken advantage of suggestions made by reviewers and acknowledges the help thus given to him. Acting on a hint in this column he has taken the opportunity to revise the index, and the main references now appear in heavy type. The appendix on blood transfusion has been remodelled and brought up to date, including a description of the Rh factor.

Dr. E. NOBLE CHAMBERLAIN has now revised his popular *Textbook of Medicine for Nurses* (Oxford University Press; 21s.) for a fourth edition. It continues to give up-to-date information on the medical disorders in a form which supplies nurses with all they need to know on causation, symptomatology, and treatment. It has a good index, a glossary, excellent illustrations, and some useful summaries in tabular form in the appendix. Yet with all this there seems to be something lacking—namely, an outlook which takes in the social aspects of medicine. Two pages on "causation of disease" at the very beginning of the book gives no idea at all of the environmental or psychological causes of disease. The author is too good a physician to be unaware of the new orientations in the medical world; perhaps his next edition will be extensively rewritten with this criticism in mind.

### Preparations and Appliances

#### SULPHANILAMIDE POURER FOR LOCAL USE

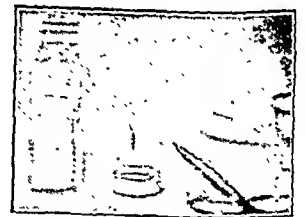
Mr. J. A. EAST, B.Sc., M.B., F.R.C.S., writes:

Mr. Hamilton Bailey and myself have been using the sulphaniilamide pourer described here with entire satisfaction. It is simple and efficient, and does not waste powder.

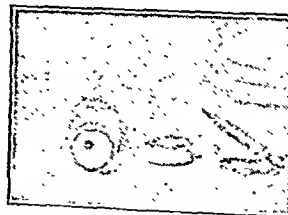
10 g. of sulphaniilamide powder are put in a bottle with a screw cap. The bottle has an inner cap with an eccentric hole in it, and is put in a carton and sterilized. The top and the bottom of the carton are held together with a strip of self-adhesive tape.



A. The sulphaniilamide pourer as supplied in a carton. The inside of the carton is sterile.



B. The carton is removed and the bottle is dropped on the sterile trolley. The screw cap is shown undone.



C. Top view of the bottle, showing the hole through which the powder comes out.



D. Sulphaniilamide powder is being poured on the wound.

When the powder is needed, an "unsterile" nurse opens the carton and drops the bottle without touching it on the sterile trolley. The surgeon can pick up the sterile bottle and use it. Whatever remains in the bottle is still sterile and can be used in the wards.

This pourer, with 5 g. of the powder as above, or containing 0.5 g. proflavine in addition, has been made for us by Genatosan, Ltd., of Loughborough. I thank Mr. P. Berry, medical superintendent of the County Hospital, Chatham, for permission to publish this account.

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## BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JANUARY 8 1944

## SURGERY OF HEAD WOUNDS

The present is a particularly appropriate moment at which to take stock of the results of specialized methods of dealing with war wounds. The North African campaigns with their varying problems of organization have terminated, and sufficient time has elapsed to allow of a useful follow-up. The campaigns of Europe are close upon us, in which it will be necessary to incorporate all the lessons that have been learnt in other theatres. The masterly account printed elsewhere in this issue, by Brigadier Hugh Cairns, of the development, organization, disposition, and activities of our neurosurgical units in North Africa and Libya gives an excellent review of the whole situation. The neurosurgeon in civil practice has long been regarded as unnecessarily slow and "finicky," and indeed has often been the butt of ridicule by the ignorant critic. That his peacetime technique could be successfully adjusted to the urgent demands of battle casualties was thought preposterous. But the end-results of neurosurgical specialists in civil surgery always justified the means, and now in battle-dress they have easily vindicated their methods. In the hands of a properly trained team equipped with suction, diathermy, etc., even the penetrating brain wound has been robbed of much of its terror; provided that operation is not delayed beyond 24 hours, and provided that the brain damage is not lethal, then prospects for recovery are bright and the risk of intracranial infection can be almost eliminated.

The strategical disposition of the units of Ascroft and of Eden and the results of their work have already been published.<sup>1</sup> To these figures Cairns adds those of Schorstein, of Sörgo, and of Cushing. The attainment of primary union in penetrating brain injuries is about the same in each series (65 to 70%), although deaths from intracranial infection occurred more frequently in the cases of Sörgo (30%) and of Cushing (36%) than in those of Ascroft (10.8%), and were least in Eden's (3.7%). The results obtained by the last-mentioned were due in part probably to the highly favourable combination of a special unit working in a forward area, with facilities for the air transport of operated and of less urgent unoperated cases back to a similar unit at the base. This was essentially a split unit with an air link. But, as Cairns points out, this disposition of the neurosurgical resources may not be the full explanation. The location of a battlefield—sited in one case in desert or sparsely populated and cultivated country, and in another case in a heavily populated and intensely cultivated area—may greatly influence the nature and the intensity of the flora of a wound. Elimination of infection from a wound sustained in France or in Russia

may be a much more difficult task than in a comparable wound in North Africa. That has yet to be determined. So far the published reports of the bacteriology of head wounds do not give much help in explaining the discrepancy between the results of neurosurgeons in North Africa and those of Sörgo and of Cushing. Pulvertaft<sup>2</sup> stresses the need for a standard technique for sampling the contaminating organisms of a wound, and the variability of the results of culture. He also raises the problem of sulphonamide prophylaxis. How valuable is it—if at all? Most surgeons believe in its efficacy, but Cairns rightly regrets that even now there is no unequivocal evidence of the value of prophylactic chemotherapy, local and general.

Penicillin was used in 23 cases of brain wounds of 3 days or older, and in some there was already pus in the brain, or a brain fungus. Only three of these patients died within the period of follow-up of 62 days. Although this is a small group, it seems clear that the effects of penicillin—when properly employed—are as dramatic in head wounds as in wounds elsewhere. Cairns sees fit modestly to state that the results are not unpromising. As the results of neurosurgeons operating early in the forward area are so good, penicillin may be found to be most beneficial in cases in which evacuation to a special unit is likely to be delayed. It seems probable that its use in full doses on a wide scale in the future campaigns will be of the greatest value in saving life and limiting tissue destruction by infection and the consequent disabling sequels. It is to be hoped that supplies will be ample, that the best technique for application will rapidly emerge, and that adequate control series are available so that the evaluation of results will be convincing.

The organization of neurosurgical units in the great campaigns imminent in Western Europe will be a difficult task, and doubtless the A.M.S. have their plans well laid, applying the lessons learnt so far. The problem is seen on a small scale in the comparison between the location of the units of Eden and of Schorstein; the former was in a "bottle-neck," while the latter was much less favourably situated to "tap" the flow of cases and to obtain segregation. If the principle of segregation continues to be accepted—and results amply justify it—then broadening of the front and widening of lines of communication will necessitate a great number of special units. At this point it is well to note the influence of air transport on this problem. Contrary to accepted neurosurgical teaching based on the experiences of the last war, it was found in North Africa that cases could be evacuated 2 to 3 days after operation without any deleterious effect. This is highly significant, and there may be two factors operating. Infection in France in 1914-18 was of a more fulminating character than that in the present series, and the deterioration ascribed to transport may in fact have been due to latent infection, possibly aggravated by transport. The other factor, probably the more important, is the nature of the transport, and in Africa air transport was employed, with its correlated speed, comfort, and lack of jolting as compared with road and rail. Therefore if sufficient trained personnel were available, the successful solution might be

<sup>1</sup> *Lancet*, 1943, 2, 659.<sup>2</sup> *Lancet*, 1943, 2, 1.

found in a multiplication of units of Eden's type—a split unit with an air link.

The alternative, as Cairns indicates, is for the general surgeon to deal with all but the more difficult wounds. If the general surgeons are to do this work successfully, then it is essential that they receive proper training and equipment, and it is equally essential that they should be convinced individually of the need for acquiring the small but important details of procedure termed technique. To quote Eden: "There is no doubt that the surgeon who first operates on an open brain wound makes or mars it. There is no useful first-aid operation." He and Ascroft give all the necessary details, and Ascroft rightly emphasizes the need for painstaking care over the minutiae which seemingly waste time: "Time is saved by not skipping the preliminaries. Careless placing of the patient on the table, niggardly shaving, and indifferent arrangement of the drapes all make for slow and wearisome operating." And this care is as necessary for scalp wounds as for penetrating injuries. That this technique justifies itself is borne out again and again in civilian and in military surgery, and has often been brought to notice. Eden obtained primary union of scalp wounds in 97% of cases, but this was obtained in only 50% of similar cases passed to him after operation by general surgeons. The respective figures for wounds with dura intact were 84% and 12% and for brain wounds 71% and 25%.

In order to undertake his share of the work the general surgeon should be given adequate opportunity for training. One cannot help feeling that in this direction—at any rate so far as neurosurgery is concerned—the A.M.S. have shown an incredible lack of foresight and of imagination during the last three years. A few courses in neurosurgery of warfare have been held, which can have been attended by only a minute fraction of Army surgeons; and such courses, good as they may be, can never compare in value with the first-hand experience afforded by living in a special centre for, say, a month. The great potential reservoir of tuition presented by the E.M.S. special head centres has been virtually untapped. It should in all fairness be made clear that the E.M.S. neurosurgeons have been clamouring for years, without response, for this opportunity of giving instruction to military surgeons.

If instructions are issued that the general surgeon shall perform only a "first-aid operation" as far as the dura, it is important that opinion should now be crystallized as to the best procedure. Should the superficially excised wound be left open as recommended by Ascroft? Or should it be closed, for fear that final operation may be delayed more than three days? Many secondary débridements were performed after a considerable interval, with remarkable recoveries in cases in which the wound had been closed at the primary operation in the forward area. Local application of penicillin may provide a solution to this question, and one wonders whether the local application of powdered proflavine in this type of case has had due consideration. Its use has been condemned, but the comparison of its necrotizing effect upon the experimental animal's brain with its effect on potentially infected and grossly traumatized brain seems hardly fair (Russell<sup>3</sup>).

<sup>3</sup> *Lancet*, 1943, 2, 580.

There is still divergence of opinion about certain other operative details. In practically all the North African cases the wound was drained for 24 to 48 hours, especially when the operation created a deep cavity in the brain. The dural tear was never repaired except in those few cases in which the wound also involved the paranasal sinuses. Sörgo drained only those cases in which operation was delayed more than 24 hours. He advocates closing the dural defect, if necessary with a fascia lata graft, and dural closure may have an important influence upon the incidence of residual brain infection. If, as Cairns suggests, infection develops first superficially in the scalp, and then spreads inwards, closure of the dura would be an advantage. On the other hand, it is clear from Eden's and Ascroft's papers that they would consider such a procedure liable to accelerate brain infection. Perhaps a combination of both methods will prove advantageous—dural closure, with a drain into the cavity between the stitches of the graft. If the insertion of a graft diminishes the amount of mesoblastic scar invasion of the brain, and thus lessens the incidence of epilepsy, then this addition to the operation would justify itself.

There is no doubt that the neurosurgical organization in North Africa and Libya has paid valuable dividends, and it is a pleasure—and one hopes not a presumption—to comment here upon the high standard of case-recording maintained under the pressure of action. Such records are the life-blood of worth-while follow-up statistics. Those who have been privileged to care for cases invalided back to this country have perused with interest and with amazement the detailed and excellent notes. It is the signature of efficiency.

### AETIOLOGY OF CONGENITAL PYLORIC STENOSIS

Congenital pyloric stenosis is not, perhaps, a common disease, but it is common compared with most hereditary abnormalities. There are a number of striking facts about its aetiology. In the first place boys are much more often affected than girls. Secondly, there seems to be a strong tendency for those affected to be first-born children. For example, Still<sup>1</sup> found that 48% of a series of 400 were first-born. Moreover, it is a congenital abnormality highly dangerous to life which yet can be treated with much success. Cockayne and Penrose<sup>2</sup> in an admirable recent investigation found that out of 221 children treated, the families being visited after an average lapse of 6½ years, 170 were alive, and in most cases appeared to be perfectly healthy.

The difficulties of investigating the aetiology of a condition of this type are not small. To take one point—the supposed susceptibility of the first-born child—it is evident that hospital data alone can provide little evidence because so many of the children with congenital pyloric stenosis are not only the first in their families but also, at that time, the last. In order to study this and other points thoroughly, Cockayne and Penrose decided to attempt to follow up after the lapse of ten years the families of 434 consecutive cases (mostly treated at St. Thomas's Hospital and Great

<sup>1</sup> *Lancet*, 1927, 2, 795, 853.  
<sup>2</sup> *Ohio J. Sci.*, 1943, 43, 43.

Ormond Street Hospital for Sick Children). It is not surprising to learn that it did not prove possible to visit more than 212, and that the interval was not, on the average, more than 6½ years. Nevertheless, valuable data have been collected and the results are remarkably interesting.

There is no doubt about the hereditary nature of this abnormality or that it depends upon a recessive gene. There is a significant excess of consanguineous marriages among the parents, as would be expected in a relatively rare recessive condition. Though the familial incidence is much smaller than the expected 1 in 4, it is real. Evidently, however, the susceptible child—that is, the child bearing the abnormal gene pair—is not always affected. Cockayne and Penrose are able to show that the additional factors determining the appearance of the abnormality are those previously suspected—viz., sex and being a first-born child. Affected boys are six times commoner than affected girls. The question of primogeniture is much more difficult to study. In the key paper on the calculation of family size Greenwood and Yule<sup>2</sup> showed that the families selected by reason of the presence of one abnormal member give an erroneous impression of size, and so, if appropriate allowance is not made, first-born children will always appear to be unduly numerous among affected persons. Even the method of Greenwood and Yule requires further modification when the interval, as in this case, between the birth of the affected child and the tabulation of family number is relatively short. Making the necessary allowances, Cockayne and Penrose leave little doubt that primogeniture is indeed an important factor. It is a good example of the difficulties of human material and of how an extensive investigation and refined statistical methods are often needed to settle a problem which at first sight seems simple. Another point about family order is that it is closely associated with maternal age; hence it is far from easy to determine which of these two factors is actually responsible. Penrose<sup>4</sup> devised an ingenious method for discriminating between the two possibilities. He then showed that in the classical instance of mongolism it is maternal age that is important and that order of birth is without effect. In congenital pyloric stenosis the reverse is shown to be true. Being a first child is what counts and not the age of the mother.

The results of this investigation are plain and leave little room for doubt. The underlying cause of congenital pyloric stenosis is the possession of a pair of abnormal genes, one received from each parent. Should the recipient chance to be a boy and first-born, he will almost certainly have this abnormality. In other words, if the first child of carrier parents is a boy, his chance of being affected is the Mendelian 1 in 4, as in albinism or amaurotic idiocy. Subsequent children who receive the two abnormal genes, or any daughter, even if she is first-born, are more likely to be normal than affected. This is a point of considerable practical importance. Cockayne and Penrose found that some parents had limited the family after the patient's operation because of the fear that another child might have to undergo the same treatment; yet the chance of a subsequent child being affected is not more than one in twenty.

## DEATH OF DR. ANDERSON

We have to announce with deep regret, which all members will share, that Dr. G. C. Anderson, Secretary of the British Medical Association, died in hospital on the night of January 1 from heart failure following the attack of coronary thrombosis which laid him low on October 23. From the day he joined the staff at headquarters in 1919 he gave himself with abounding energy and enthusiasm to the Association and the profession, and in their service he wore out a fine physique. Our personal loss cannot be measured in words, but a memoir of Dr. Anderson, with some tributes from Officers of the Association past and present who have had very close relations with him, appears in this week's *Journal*.

## HEAT IN THE TREATMENT OF SHOCK

In the last war the shocked wounded were vigorously heated because they were cold. The application of radiant-heat cradles became an accepted principle of treatment. It was claimed, as a result of heat therapy, that the pulse improved in volume. Between the two wars, however, accumulated evidence cast doubts on the wisdom of heat in the shocked patient. Extensive studies by Lewis's school on the blood vessels of the skin showed that heat produced a great increase in blood flow through the skin, and that the vessels of the hand took a very large share of this increase. The skin of the human hand is, in fact, an important temperature regulator, similar to the ear of the rabbit. It would be surprising, therefore, if the application of excessive heat did not bring about an "improvement" in pulse volume at the wrist. We must question, however, whether an increased blood flow through the skin is a desideratum in shock, where the blood pressure is low as a result of acute loss of blood. Bazett<sup>1</sup> has estimated that 500 c.cm. of blood may be diverted into the warm skin. In addition to the increased flow through the skin, blood flow through muscle is also increased by heating (Barcroft and Edholm<sup>2</sup>).

Taking cognizance of these considerations, Blalock and Mason<sup>3</sup> in crude but striking experiments on dogs showed that excessive heat was harmful and accelerated death. Cleghorn<sup>4</sup> has demonstrated in careful and painstaking studies on dogs bled to a blood-pressure level at which the expected mortality was 40% that the optimum external temperature is 72° F. At this temperature 18 out of 22 animals survived; at an external temperature of 95° F. only 1 out of 14 survived. Man and dog, however, are different species, and more observations are required in normal human subjects and in patients suffering from different types of "wound shock." Brown, Evans, and Mendelssohn<sup>5</sup> mentioned a slight fall of blood pressure on the application of radiant-heat cradles. Kay, in our current issue, now demonstrates in "normal" convalescents a fall in arterial pressure and a rise in venous pressure in response to heating. These effects can both be explained by peripheral vasodilatation. Such observations, however, mark only the beginning, and much remains to be done. Is the cardio-acceleration on heating a direct temperature effect, or does it result, as Kay suggests, from increased venous return exciting a Bainbridge reflex? Are rises of venous pressure in the peripheral veins of man paralleled in magnitude by changes in pressure in the right auricle? If the increased peripheral circulation is part of a general

<sup>1</sup> *J. Amer. med. Ass.*, 1938, 111, 1841.

<sup>2</sup> *J. Physiol.*, 1943, 102, 5.

<sup>3</sup> *Arch. Surg.*, 1941, 42, 1054.

<sup>4</sup> *Canad. med. Ass. J.*, 1943, 49, 363.

<sup>5</sup> *British Medical Journal*, 1943, 1, 66.

<sup>2</sup> *J. statist. Soc.*, 1914, 77, 179.

<sup>4</sup> *Ann. Eugenics*, 1934, 6, 108.



increase in minute volume flow, at what stage of reduced blood volume does heating cease to improve the general circulation and increase the peripheral flow only at the expense of vital internal organs?

The study of such circulatory reactions in injured and normal man not only will improve our management of the injured but will add richly to our knowledge of human physiology. The techniques of study developed by Cournand and his colleagues<sup>6</sup> show the way in which these problems may be approached: their bold, brilliant, and apparently safe technique of intracardiac catheterization seems to open a new era in the research study of human cardiodynamics. Research by this method in severe shock would sweep away much doubt and obscurity. Meantime, as a practical policy in the treatment of shock, we must accept the evidence that overheating is harmful, and agree that a comfortable external temperature environment is probably best.

### WAR IN THE NURSERY

War nurseries are now in the limelight of controversy. Clearly all is not well when an authority such as Dr. Helen Mackay, after careful investigation, has to report a high incidence of infection and a low incidence of happiness. Although this statement has evoked protest from an experienced nursery teacher, there is ample evidence, from other good teachers and nurses, of grave distress among their children. Unhappily for the "under-fives," the characteristics of their age make them peculiarly sensitive both to any disruption of the family situation and to the fact of war. Children are born as little savages whose destructive and aggressive impulses are primarily diverted to social ends through love relationships, formed first by intimate contact with the mother, and extended in widening circles to others within the home until, upon the pattern so established, contacts are made with the larger world of human society. In the years from 2 to 5 the battle between love and primitive impulse is at its height. Dr. E. Benjamin<sup>7</sup> describes this as the "Age of Resistance." Winnicott, Bühler, Isaacs, Bowley, and others all note the turbulent characteristics of the age. Anna Freud, in her report of the admirable Hampstead nurseries, quotes a saying, half-joking but significant—"There is continual war raging in the nursery"—with reference to the violently aggressive tendencies normal in the early years. Such tendencies are the growing-pains of the parent-child relationship. In the course of natural development they are outgrown if wisely handled within this relationship. Separation from home cuts at the root of the little child's intrafamily situation which is the basis of his social development. No longer has he the incentive to sacrifice his unclean habits, his tempers, and general devilry that he may secure his mother's love. This he has always feared to lose, and now in his immature judgment it is already lost, or why should she have abandoned him to others? In such a desperate situation he must either withdraw into anxiety and depression, or in self-preservation, as it seems, he must rage more furiously.

At the present time there is the added danger that the destructive impulses let loose in war may serve to fan the flame of aggression natural to the nursery age. Bombing, killing, burning are all accepted by adults as meritorious when meted out as retribution to the wicked enemy. These are the terror-making fantasies of early childhood come true, provoking further fear and reactive resistance to a world so dangerous. It is small wonder that the nursery

situation is a difficult one, that children are often unhappy, and the nerves of staff strained to breaking-point. Some notable nurseries, which lay much stress on mothering their temporary orphans, have proved that in many cases it is possible to overcome difficulties, but these must be recognized to be resolved. If they are not, asocial or anti-social behaviour remains as a fixed protest. The "Age of Resistance" may thus be prolonged to adolescence or adult life in the form of bitterness, irresponsibility, or delinquency.

### NO NEWS BUT THE OLD NEWS

A letter in the *Times* of Dec. 31 reminded us that 1943 saw the centenary of the publication of the *New England Quarterly Journal of Medicine and Surgery*, which was edited by Charles E. Ware, M.D., and Samuel Parkman, M.D. This journal was published in Boston and came to an end after a year. In its April issue appeared the article by Oliver Wendell Holmes entitled "The Contagiousness of Puerperal Fever." This had previously been read before the Boston Society for Medical Improvement. Tales from medical history are always worth retelling, even one so familiar as the story of puerperal fever. As the exciting causes of puerperal fever have been tracked down in detail only recently, it is of interest to note that nearly 101 years ago Oliver Wendell Holmes began his paper thus: "In collecting, enforcing and adding to the evidence accumulated upon this most serious subject, I would not be understood to imply that there exists a doubt in the mind of any well-informed member of the medical profession as to the fact that puerperal fever is sometimes communicated from one person to another, both directly and indirectly." A little later in his paper he states his thesis in this way: "The practical point to be illustrated is the following: *The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses.*" (The italics were his.)

Semmelweis, who shares with Holmes what one might call the honours of puerperal fever, became an assistant in the first obstetric ward of the Allgemeines Krankenhaus in Vienna in 1846, and in 1847 published his work on the aetiology of epidemic puerperal fever. Garrison, in his *History of Medicine*, pays due tribute to Semmelweis and Holmes, and also to Charles White of Manchester, but makes no mention of the work of Dr. Alexander Gordon of Aberdeen, so generously acknowledged by Holmes in his original paper. Dr. Gordon published a treatise on puerperal fever in 1795. Evidently his observations had been, as Holmes points out, "occasionally copied into other works." It may therefore be of interest if we follow Oliver Wendell Holmes's example of giving exact quotations from Dr. Gordon's treatise:

"This disease seized such women only as were visited, or delivered, by a practitioner, or taken care of by a nurse, who had previously attended patients affected with the disease."

"I had evident proofs of its infectious nature, and that the infection was as readily communicated as that of the small-pox or measles, and operated more speedily than any other infection with which I am acquainted."

"I arrived at that certainty in the matter, that I could venture to foretell what women would be affected with the disease, upon hearing by what midwife they were to be delivered, or by what nurse they were to be attended, during their lying in: and, almost in every instance, my prediction was verified."

Modern workers have in effect done little more than dot the i's and cross the t's of this story, by stating in exact terms just what the infection is.

<sup>6</sup> *Surgery*, 1943, 13, 964.  
<sup>7</sup> *Amer. J. Dis. Child.*, 1942, 63, 1019.

## THE MODERN TREATMENT OF GONORRHOEA IN THE FEMALE\*

BY

T. E. OSMOND, M.B.

*Brigadier, Consulting Venereologist to the Army*

Gonorrhoea in the female is similar in many respects to that in the male, but in some ways is of considerably more importance, since many women suffer from the disease without knowing it and therefore probably convey it to a greater number of people than they would otherwise. Incidentally, too, gonorrhoea not only may infect the eyes of the child during its passage through the birth canal but is also a very common cause of sterility, mainly as a result of salpingitis causing occlusion of the Fallopian tubes. In the case of gonorrhoea in a married woman consent should be obtained to tell the husband not only in order that he may be examined and, if necessary, treated, but also to avoid the risk of marital infelicity should he find out accidentally; in the case of a girl under 21 the parents should be told if circumstances appear to demand it. Such action is likely to prevent difficulties arising later, especially if the girl should become engaged to be married. It is a great mistake to adopt a policy of secrecy, and all those who are, or are likely to be, involved should be told in confidence.

### Diagnosis

The signs and symptoms may be much the same as in the male—that is, a discharge of greenish-yellow pus accompanied by pain on micturition—but often the latter is entirely absent, and it must be remembered that discharges of various kinds are regarded by many women, especially multiparae, as hardly abnormal.

Place the patient in the lithotomy position and separate the labia majora; note any discharge from the vulva, vagina, and urethra, any swelling or inflammation of Bartholin's glands, and any discharge from their ducts. Swab the vulva clean and dry; pass the first finger of the gloved left hand into the vagina and draw it forward along the floor of the urethra; by this means any discharge will be brought to the urethral orifice; near this latter look for any discharge from Skene's ducts. Next pass a speculum (Cusco) into the vagina and open it to bring the cervix uteri into view; note any erosion of the external os; clean the cervix and surrounding parts with a swab—dry or soaked in weak alkaline solution if there is much mucoid secretion—and note any discharge coming from within the canal. Take specimens for smear and culture from within the urethra and cervical canal and from any discharge from Bartholin's ducts. Examine uterus and adnexa bimanually to ascertain if pelvic inflammation, especially salpingitis, is present.

In cases of acute gonorrhoea gonococci are easily demonstrated, but in chronic cases they are often difficult to find; if gonococci are not in evidence at first, further examinations should be carried out at short intervals. Gonococci are most likely to be found *immediately* after a menstrual period (some clinicians recommend examination *during* a period). Such examination should be repeated monthly, if necessary for three months, before gonorrhoea can be excluded. It is most important to take cultures as well as smears, since the flora of the vagina are very numerous and varied and it is often quite impossible to say whether gonococci are present or not from the examination of smears alone. In chronic cases a gonococcal complement-fixation test (G.C.F.T.) is often helpful, but in acute cases this will usually be negative unless the disease has been present for some time or complications are present; a positive reaction is valuable, but a negative one does not exclude gonorrhoea.

In acute cases examination of the urine, as in the male, will frequently reveal a haziness due to pus if the patient has not passed water recently; specimens may be made from centrifuged urine for bacteriological examination. In chronic cases diagnosis is often very difficult, and can be established only by repeated careful examination and taking of specimens; the latter are best taken with a sterile platinum loop or a dressed Playfair probe. No lubricant should be used when passing a

speculum, since this may inhibit the growth of gonococci in cultures. In all cases it is wise to look for trichomonas vaginitis at the same time, as this is a very common accompaniment of gonorrhoea and, if present, is apt to delay cure unless vigorously treated.

### Treatment

Early acute cases usually react well to chemotherapy, but old-standing chronic cases, especially where the cervix uteri and perhaps the pelvic organs are involved, are often very difficult to cure. The general practitioner will do well to remember this and not undertake the treatment unless he feels thoroughly competent to do so. If the patient is married it is most important that the husband should be examined and, if necessary, treated; if husband and wife are both infected they should obviously both be treated, as otherwise repeated re-infection may occur. In any case it is the moral duty of any physician treating a case of communicable V.D. to endeavour to trace the source of the infection and bring him or her under treatment.

**General Treatment**—This should be on the same lines as for males; rest during the acute stage and careful personal hygiene are most important.

**Chemotherapy**.—Sulphathiazole 4 g. a day (1 g. four times a day) for 5 days—total 20 g.—will cure the great majority of acute cases, and the fluid intake should not be less than 6 pints. Where the patient can be kept under the physician's eye—e.g., in hospital—a rather higher dosage may be employed. Bolton (1943) recommends 7.5 g. the first day and 5 g. daily for the succeeding four days—total 27 g., the patient being kept in bed during the period of chemotherapy. In either case if the first dose is given early in the morning and the last dose late in the evening there is no need for one during the night. Should a second course be necessary an interval of seven days should be allowed to elapse and preferably the type of sulphonamide changed—e.g., to sulphadiazine or sulphapyridine; a blood count should be done before starting a second course. Intolerance and its treatment are the same as in males. The urine should be rendered alkaline with sodium bicarbonate to prevent haematuria, and if symptoms are acute tincture of hyoscyamus minimis 20 and tincture of belladonna minims 5–10 three times a day may be prescribed.

**Local Treatment**.—In acute uncomplicated cases this is rarely indicated beyond that necessary for personal hygiene—i.e., frequent hot baths, to which alkalis may be added, and the keeping of the affected parts dry and clean. In chronic cases, and especially those which do not react to the sulphonamides, irrigation of the urethra and bladder may be carried out as in the case of males; but routine vaginal douches are to be deprecated, dry or moist swabbing being preferable. It should be remembered that in adult females vaginitis is not a prominent lesion, the brunt of the disease falling on the urethra and cervix uteri. The vagina and cervix should be swabbed, dry or with a mild antiseptic, using a Playfair probe dressed with cotton-wool, and, following this, the whole surface should be dusted with powder applied by means of an insufflator. Cervical erosions should be treated, after clearing the secretion away, with weak alkali, with topical applications, applied by means of a Playfair probe, care being taken not to pass the internal os. Probably the best substance is glycerin, and this may be used neat or in the form of glycerin of borax or glycerin of ichthylol 5%; other applications recommended are mercuriochrome 1%, picric acid 1% in spirit, and acriflavine 0.5 to 1%. These applications should be carried out daily in subacute cases and once or twice weekly when the condition is chronic, ringing the changes on the various preparations. Cystic swellings (ovulae nabothi) are treated by puncture. As an adjuvant to chemotherapy the insertion of two tablets of acetarsol at bedtime is very helpful, or the vagina may be insufflated daily with this drug in powder form or with powdered sulphanilamide; local treatment should be carried out by the nurse or the medical officer himself wherever possible. Sulphonamide-resistant cases often call for pyrotherapy, applied by means of a fever cabinet or protein injections (e.g., T:A.B. vaccine) as described for males.

### Complications and their Treatment

Many of these react well to chemotherapy, but a closed focus—e.g., a Bartholin's abscess—should be drained. When serious complications occur it is wise to refer the case to a specialist

\* Written by request in continuation of the article on gonorrhoea in the male which appeared in the *Journal* of July 17, 1943 (p. 72), and for the same reasons.

if they do not clear up under chemotherapy. When chemotherapy fails the following measures may be adopted:

1. *Skenitis*.—This is an inflammation of the gland ducts opening on either side of the urinary meatus; the ducts should be destroyed with the electric cautery or fused silver nitrate, or injected with tincture of iodine, 10% silver nitrate, or 10–20% mercurochrome.

2. Urethral caruncle, which forms at the meatus, should be excised or cauterized.

3. *Bartholinitis, or Bartholin's Abscess*.—The gland should be dissected out or the abscess laid open freely.

4. *Salpingitis, Oophoritis, and Pelvic Peritonitis*.—If acute the patient should be put to bed in the Fowler position and treated on expectant lines; as soon as the acute symptoms have passed off, hot vaginal douches may be given once or twice daily, and, when the chronic stage is reached, two or three times a week. Operation is rarely called for if the infection is purely gonococcal; if in doubt call in a gynaecologist.

5. *Metritis and Endometritis*.—In the acute stage treat as for salpingitis. When acute symptoms pass off, treat as for cervicitis; dilatation of the cervix and the insertion of a glycerin drain are often helpful.

6. Other complications, arthritis, etc., are dealt with in the same way as in males.

7. *Trichomonas vaginitis*, which, as has been said, is a very common accompaniment of gonorrhoea, should be treated from the first; it is troublesome to cure and very apt to relapse. Its presence should be suspected in those cases of gonorrhoea which fail to clear up in the ordinary way.

#### Tests of Cure

These are even more essential than in males, because conclusive evidence of cure is so much harder to obtain. Gonococci have a way of disappearing under treatment and reappearing after treatment has been stopped, more especially at the menstrual periods; apparently they may lie dormant in the endocervical glands for very long periods. One or two tests should be carried out at four-day intervals following completion of treatment, and then monthly for at least three, and preferably six, months before the patient is discharged as cured. These latter examinations should be carried out immediately after a menstrual period, since it is at this time that gonococci, if present, are most easily detected. The following procedure is recommended:

1. Clinical examination, including smears and cultures from the vagina, urethra, Bartholin's ducts, and the endocervix. Specimens should also be taken from the rectum, as this is often infected in females. The importance of cultures cannot be overestimated, but it is essential that a suitable medium be employed.

2. Examination of vagina and cervix through a speculum.

3. Examination of the urethra through a urethroscope.

4. Bimanual examination of the pelvic organs, including uterus, tubes, and ovaries.

5. G.C.F.T.—This is of particular value when the disease has been chronic, if there have been complications, or if a previous, ositive result has been recorded.

During the period of observation in the case of a married woman, if intercourse takes place the husband should employ a sheath, not only for his own protection but in order that impregnation should not occur. A woman should not allow herself to become pregnant until the fact of cure has been established with as great a degree of certainty as possible.

#### Pregnancy and the Puerperium

The treatment of gonorrhoea during pregnancy is similar to that already described, but it is important to exercise the greatest gentleness both in taking specimens and in carrying out instrumental treatment in order to avoid the risk of inducing an abortion or miscarriage. Douching should be avoided and, owing to the fact that the discharge is often profuse, care should be taken to keep the genital area dry with dusting powder to avoid excoriation. Sulphonamide drugs are not contraindicated—pregnant women tolerate them well—but anything likely to cause a general reaction should be avoided. When labour starts an endeavour should be made to cleanse the birth canal, as it is particularly important to avoid risk of infection of the eyes of the infant; they should be treated thoroughly as soon as it is born.

If fever occurs during the puerperium it is possible that the gonococcus may be responsible; if the interior of the uterus is involved a catheter should be passed, with aseptic precautions, up to the fundus and glycerin or glycerin and iodine instilled

through it. The patient should of course be kept in the Fowler position.

#### Gonorrhoea in Female Children: Vulvovaginitis

The vagina of the adult is lined with stratified epithelium and is therefore relatively resistant to the gonococcus; but that of the young female is lined with delicate columnar epithelial cells, and is very susceptible to infection. Infection may occur at birth direct from the mother's secretions or at any time up to puberty through the medium of infected articles such as towels, napkins, underclothing, baths, and instruments. Criminal assault is a not uncommon cause.

*Signs and Symptoms*.—In the case of young females the brunt of the attack falls on the vagina, though the urethra almost invariably and the cervix frequently are also involved; the vulva is usually red and inflamed, and may be excoriated; discharge is often profuse and there is considerable discomfort. Specimens for bacteriological examination should be taken as in the adult, but it will often be impossible to pass a vaginal speculum; in such cases a urethroscope as used for the adult male is most useful for examining the interior of the vagina and the cervix. It must be remembered that the majority of cases of vulvovaginitis are due to causes other than the gonococcus: these include other organisms (staphylococci, streptococci, etc.), parasites, and trauma; a diagnosis of gonorrhoea should therefore not be made unless the gonococcus is demonstrated. The anal canal and rectum are commonly involved, and these should be examined carefully in all cases.

*Treatment*.—It should be remembered that this disease is extremely contagious and may easily spread rapidly through a community of young girls; the patient should therefore be isolated and the communal use of toilet articles forbidden; all contacts should be examined and every endeavour made to find and treat the source of the infection. Chemotherapy is the treatment of choice, and the disease usually reacts well. Sulphathiazole should be prescribed in dosage according to age and weight (0.5 g. per 15 lb. of body weight)—i.e., one-quarter to half a tablet three times a day in early life, rising to one tablet three times a day at the age of about 5 years; the usual precautions as to side-effects must be taken. Frequent hot baths and scrupulous cleanliness of the affected parts—keeping them as dry as possible—are indicated; but local treatment should be avoided so far as is possible, as this has a bad psychological effect and may lead to masturbation. Where indicated, local treatment is similar to that for adults, the cervix being treated through a urethroscope. When other methods fail an attempt to encourage the formation of resistant epithelium may be made by the administration of ovarian hormones; but this is a matter for the expert. Cases of vulvovaginitis are notoriously difficult to cure, and are very liable to relapse; treatment should therefore be continued, except in those cases which react well to the sulphonamides, for some time after all gonococci have disappeared, and tests of cure should be carried out over considerable periods, particular attention being paid to the rectum.

#### REFERENCE

Bolton, Marjorie (1943). *Brit. J. vener. Dis.*, 19, 95.

#### THE ORDER OF ST. JOHN

Two reports, the covers of which bear the white eight-pointed cross of the Order of St. John, have been received from the Chancery of the Order in the ancient gateway of St. John's priory at Clerkenwell. One of them is a report of the Chapter-General of the Order on the progress of its various modern foundations—namely, the St. John Ambulance Association and the St. John Ambulance Brigade at home and over-seas; the other gives an account of the ophthalmic hospital of St. John in Jerusalem, the city where the original Order was founded during the first Crusade. There were critics years ago, both before and after the incorporation of the English branch of the Order by a charter granted by Queen Victoria, who described it as sham-Gothic and absurd, but every critic must by now have been won over by the disciplined humanitarian work of this venerable institution.

#### Work of the Association and Brigade

The St. John Ambulance Association issued just upon 120,000 first-aid certificates last year and nearly 25,000 certificates for home

nursing. It organized a very large number of classes for the instruction and examination in first aid of members of the Home Guard and of the Civil Defence services. Over 100,000 of those who hold the certificate present themselves for re-examination yearly. The current textbook of the Order, since its appearance in 1938, has reached a circulation of 2½ million copies. The Brigade, too, is flourishing, with an increase during the last year in this country alone of 20,000 members, bringing the total to 167,000. In the Provinces, particularly in the smaller towns, the casualty services are largely manned by St. John's personnel, assisted by the British Red Cross Society. While their help in dealing with casualties is only occasionally required, they must always be ready to answer a call. Another activity of the Brigade is the motor ambulance service, which continues to render valuable assistance to the civil population. The number of cases conveyed in a year runs into six figures. The Brigade enlists the services of 3,000 surgeons, many of whom, in addition to their Brigade duties, are also serving in Home Guard units and at first-aid posts. We can well believe that many local authorities who are responsible for the posts regard those which are under the control of the Brigade surgeons as the most efficient in their area.

It is just fifty years since the first division of the Brigade was established overseas—in New Zealand—and now there are reports from all the Dominions and from many of the Colonies of encouraging progress, while Australia has just attained the dignity of a "commandery." In Bombay members of the Brigade put in 75 hours of consecutive duty when a large building collapsed causing many deaths; they rendered first aid to 342 persons. A special word should be said about the members of the Brigade serving in Malta, who have had to stand the strain of 2,000 air raids.

#### Ophthalmic Hospital In Jerusalem

The ophthalmic hospital in Jerusalem was founded sixty years ago, and last year it had 20,000 new patients and the total number of consultations was 125,000. In addition to its work in the ancient city it is responsible for ten ophthalmic clinics attached to Government hospitals in outlying centres in Palestine, from Acre and Safed in the north to Gaza and Beersheba in the south. These are staffed by medical officers and nurses, the latter obtaining their ophthalmic training during a four-months course at the hospital. The Government in Palestine is taking steps to minimize eye disease by means of propaganda films which are sent through the villages, and in these the value of the hospital service is given prominence. It is mentioned by the warden, Dr. Norman Manson, that the incidence of trachoma among the out-patients of the hospital was 89.3% last year, but that the neglected and virulent type of trachoma which was common even ten years ago is not often seen. Acute conjunctivitis continues to take its yearly toll in the summer epidemics that ravage the Near and Middle East. Excellent work is being done by the hospital, and a recent visit by the Duke of Gloucester, the Grand Prior of the Order, gave the workers much encouragement.

#### GRANT-IN-AID PLAN FOR HOSPITAL SERVICE

King Edward's Hospital Fund for London has sponsored a Hospital Service Plan whereby people of moderate means, in return for their subscriptions, may receive grants-in-aid towards the payment of hospital charges and medical fees. A non-profit-making company—the London Association for Hospital Services, Ltd.—has been created to operate the plan.

The method depends upon a system of monthly, quarterly, or annual subscriptions, or, if preferred, by arrangement with employers, of deductions from pay. Subscribers are required to undertake payment of subscription for one year, after which membership is renewable annually. Grants are made towards the cost of six weeks' treatment received by the subscriber or by his or her dependants up to a total of one hundred guineas in any one membership year, and the eligibility for such assistance begins six months after the effective date of enrolment. Applications are invited from all persons up to sixty years of age, regardless of their rate of income, provided that they live or are employed within the metropolitan area. The rate of subscription varies according to the number of dependants. For the single subscriber it is 4s. 4d. monthly, and for the subscriber with four dependants it is a maximum of 8s. 9d. Only one adult dependant may be registered by each subscriber. A schedule of rates of repayment for nursing-home charges, fees of physicians and surgeons, anaesthetist's services, and other forms of investigation and treatment is published, but a considerable number of classes of treatment—including, for example, primary consultation fees, maternity treatment, and medical cases normally treated by the patient's own doctor in the surgery or at the patient's home—are excluded from liability. It is agreed that full cover is the desirable ideal, but until that can be undertaken the present grant-in-aid scheme is believed to fill a distinct need.

The scheme has been prepared with the full approval of the voluntary hospitals and of the British Medical Association, whose secretary is a medical member of the council of management. There are, naturally, a number of conditions attached to an insurance scheme of this nature, but they bear every evidence of having been carefully thought out so as to afford as much benefit to the insured person as possible. Particulars can be had from the offices of the London Association for Hospital Services, 10, Old Jewry, E.C.2.

#### FURTHER INCREASES IN NURSES' PAY

Publication of the second report of the Rushcliffe Committee on Nurses' Salaries means that the salaries of all nurses in England and Wales except those in mental hospitals have now been reviewed. (The recommendations affecting hospital nurses were noticed in these columns on Feb. 27, p. 264, and for midwives on Aug. 21, p. 242.) The latest report covers nurses in the public health services, in residential and day nurseries, district nurses, and male nurses, and like the earlier one recommends national salary scales to apply throughout England and Wales, which will in most cases mean substantial increases.

Nurses in the public health services include health visitors of all grades, school nurses, tuberculosis visitors, and nurses in V.D. clinics, and the proposed new salaries are: for a health visitor, £270, rising by £10 a year to £360; superintendent health visitor, £360 to £550 according to the numbers supervised; tuberculosis visitor, £270-£360; school nurse, £220-£310; nurse in V.D. clinic, £250-£320.

The committee concurs in the view long held by the medical profession that the pay of district nurses has never been commensurate with their responsibility, and it proposes that a State-registered district nurse living in a district nurses' home shall receive £120 a year, rising by £10 to £180, the total value of salary and emoluments to be £220-£280. A similarly qualified district nurse living at home or in rooms should receive salary and emoluments of £230-£300. The village nurse-midwife (S.C.M.) living in a district nurses' home is to receive £100-£170 (total value of salary and emoluments £200-£260), and if she lives at home a total of salary and emoluments of £210-£270.

As regards nurseries, the committee has confined itself to recommendations affecting State-registered nurses employed in day or residential nurseries, and for these the new salaries suggested are £170, rising by £10 to £240, with emoluments of £100 in addition, for the matron of a residential nursery housing 40 or more children and having students in training. Where no training is given the salary should be £150-£220, with the same emoluments. A non-resident matron should receive £195-£305 and her deputy £165-£255. The salaries of male nurses, who number some 2,000, mostly employed in London, will be £7 14s. 6d.-£9 10s. 6d. a week for a qualified senior tutor, £6 5s. 6d.-£7 5s. 6d. for a superintendent nurse, and £5 0s. 6d.-£5 15s. 6d. for a staff nurse.

Other recommendations of the committee concern uniform, holidays, and sick pay. These are all comparable with similar recommendations in the earlier report, and will result in a welcome uniformity in the different branches of the profession. Throughout the report the need for refresher or "post-certificate" courses is emphasized, and suggestions are made for grants to enable nurses to attend such courses. Two criticisms are to be noted: (1) the committee does not consider that three months' experience in tuberculosis nursing is sufficient qualification for a tuberculosis visitor; (2) the committee has found that no statutory qualifications have been laid down for school nurses; it recommends that the appropriate Departments give attention to these matters. The new scales are to be retrospective from April 1 last, and the Ministry of Health, which is asking all employing authorities to put them into effect, is to make a grant of 50% of the additional cost (100% in the case of nurseries) provided the recommendations are adopted in their entirety. The Board of Education is following the same course for the school medical services.

#### RETRAINING OF DISABLED PERSONS

The increased attention so rightly given to rehabilitation of the injured person, culminating in the second reading in the House of Commons of the Disabled Persons (Employment) Bill, has called forth a reminder from the L.C.C. that rehabilitation has been part of the Council's medical services for the past thirteen years. It employs a large number of masseuses and physiotherapists and has established two special fracture centres, one north and one south of the Thames, where the latest advances in the treatment of fractures are put into practice. Occupational treatment, organized games, and physical exercises, together with special treatment for those in whom there are psychological hindrances to recovery, have been features at the Council's two convalescent homes—Queen Mary's, Sidcup, and Princess Mary's, Margate.

Many hundreds of disabled persons have been restored to whole or partial self-support at the L.C.C.'s training centres for patients

from its hospitals, while there are special arrangements whereby those suffering from neurosis and also the psychotic and higher-grade mental defective receive treatment and are helped to find suitable employment. Tuberculous patients who, though improved in health, cannot compete in the open labour market are accommodated at Papworth and Preston Hall, and for some years now the Council has subsidized the Spero workshops. As long ago as 1938 a survey was made of all those on long-term relief with medical certificates of unfitness due to neurosis. Most were found to be receiving adequate treatment, but as many as possible of the others were taken into occupation centres for gradual retraining. Good work has also been done among young and "improvable" vagrants; by the elimination of physical disabilities numbers have been retrieved from vagrancy. Then there is the education, including craft training, which is given to the physically defective in the Council's hospital and day schools. Thousands of young cripples have been successfully absorbed into industry since these schools were started 45 years ago. To-day hospital patients undergo a final hardening process before discharge. Those confined to bed for long periods are given regular exercises to keep up muscular tone, but as soon as they are up they go to physical training classes and to the workshops, where a great variety of work, from bookbinding to carpentry, is done. Occupation for the mind is provided in discussion groups and lectures. There are three L.C.C. hospitals where special provision is made for cases of war neurosis.

### MATERNITY AND CHILD WELFARE SERVICES OF LONDON

Large readjustments of maternity services in London are forecast in a report by the London Maternity Services (Voluntary Organizations) Joint Committee, which represents voluntary hospitals and district nursing associations undertaking midwifery within the Metropolitan Police district. There is now a shortage of maternity beds in the outer London area. The population of outer London—that is, London outside the L.C.C. area—is larger by some half a million than the population within the county, and yet, in a pre-war year, the number of maternity beds in that outer area was only half the number available in inner London.

The requirements of the metropolitan teaching hospitals have to be considered, however, before any general transference to the periphery is proposed. On the pre-war basis of 5,000 medical students taking their training at the London teaching hospitals, and of 700 taking their course in midwifery each year, with the requirement that each of them should deliver a minimum of 20 cases, 14,000 confinements, intern and extern, would be needed for their adequate training. In the committee's view, in post-war planning it would be unwise to allow for more than 1,500 to 2,000 district cases (extern). Moreover, it is probable that the number of undergraduates will increase in the immediate post-war years. Hence it is thought that at least 700 maternity beds, allowing for approximately 14,000 institutional confinements, should be reserved for the teaching of medical students.

The general conclusion of the committee is that in post-war planning additional midwifery accommodation should be provided towards the boundaries of the L.C.C. area and in outer London, and that the existing maternity beds in central London should be readjusted so as to ensure that adequate teaching provision is made for medical students. It is suggested that the Metropolitan Police district should be divided into areas, taking into account existing borough boundaries and the maternity facilities available, and arranging for each district to have a key hospital. The suburbs would be served by small maternity units working as annexes of the key hospitals. It is also urged that there should be close liaison between voluntary hospitals and local authorities on all questions relating to the future provision of midwifery accommodation and services so as to avoid wasteful overlapping and to ensure that beds are provided where they are most needed.

The key hospitals would be well-equipped maternity units with a minimum of 100 beds and accommodation for ante-natal and post-natal in-patients. A unit at or connected with a general hospital should have not fewer than 50 beds. Until these units can be provided small maternity homes and private nursing homes now in existence must continue to serve obstetric cases, and an endeavour should be made to arrange for close co-operation between them and the key hospital of their area. At present there are no large voluntary maternity units in

the north-west, south-west, or south-east of the County of London, but there were enough maternity beds in central London before the war, and if the teaching hospitals accept the recommendation of the Royal College of Obstetricians and Gynaecologists to provide their own maternity units, this will mean an addition of some 350 beds in this area. The committee therefore suggests that if as part of this plan the three lying-in hospitals in the centre of London—the City Maternity, East End Maternity, and the General Lying-in—could see their way to move towards the boundary of the L.C.C. area, and if the L.C.C. would agree to provide obstetric units in connexion with its hospitals in north-west, south-west, and south-east London, instead of on their present sites, the County of London would be surrounded by maternity hospitals which could, with some extension and improvement, serve as key hospitals for the outer London area.

### Proposed Unifying Board

After a review of the various components of the existing maternity and child welfare service, directed and controlled as they are by a number of different organizations, the committee proposes the setting up of a new authority to be appointed by the Ministry of Health and to bear some such name as the Maternity and Child Welfare Board for Greater London, with its appropriate place in the maternity section of a national health service. All the bodies concerned, including voluntary hospitals and consultants and general practitioners, as well as the local authorities, would be represented on the board, and a small executive should be set up with professional and technical panels, consisting of people with special qualifications as authorities on the subject and with experience of some branch of maternity or child welfare. This board would have power to make recommendations concerning the distribution of funds made available by the Government for this work in both voluntary and municipal institutions, and it would be responsible for all matters of policy affecting maternity and child welfare.

If the maternity service of London is to be really efficient, with no overlapping and no break in continuity in the care and supervision of the mother and her child, the arguments in favour of such a board, based on a partnership between voluntary organizations and local authorities, seem to be incontrovertible.

### MEDICAL RESEARCH IN EIRE

The Medical Research Council of Ireland (85, Merrion Square, Dublin) has made the following grants:

#### Whole-time Awards

Dr. Vincent C. Barry. Fellowship in organic chemistry to undertake an investigation into the chemotherapy of tuberculosis; work to be carried out in the Chemical Department of University College, Dublin, under the direction of Prof. T. J. Nolan and the Council's Chemotherapy Committee.

Dr. Michael Flynn. Fellowship to undertake an investigation into the typhoid carrier condition; the work to be carried out in the Department of Bacteriology, University College, Dublin, Grangegorman Mental Hospital, and the Dublin Fever Hospitals, under the direction of Prof. W. D. O'Kelly and in collaboration with the resident medical superintendents of the hospitals concerned.

Dr. Patrick A. McNally. Fellowship in bacteriology to undertake an investigation into the chemotherapy of tuberculosis; work to be carried out in the School of Pathology, Trinity College, Dublin, under the direction of Prof. R. A. Q. O'Meara and the Council's Chemotherapy Committee.

Dr. Diarmuid Murphy. Fellowship to undertake an investigation into the methods of production of penicillin, in the Botany Department, University College, Dublin, under the direction of Prof. J. Doyle, and in collaboration with Mr. Oliver Roberts.

#### Grants-in-Aid

Dr. Bryan Alton. For expenses in connexion with an investigation into the bacteriostatic effects of products of *Penicillium notatum* and other moulds, in the Department of Bacteriology, University College, Dublin, under the direction of Prof. W. D. O'Kelly.

Prof. T. W. T. Dillon. To enable him to employ technical assistance in his investigation of the problem of diuresis.

Prof. W. J. E. Jessop. For technical assistance for section-cutting in his research work.

Dr. A. G. G. Leonard. To enable him to maintain records of pollution by sulphur dioxide and suspended impurity at Merrion Street and at the Albert Farm, Glasnevin.

The following have had their grants renewed for further periods: Prof. R. A. Q. O'Meara, Mr. P. J. Boyle, Dr. O. FitzGerald, Mr. D. J. Hingerty, Dr. D. K. O'Donovan, and Miss E. O'Donovan.



## ROYAL COLLEGE OF SURGEONS

## THREE HONORARY FELLOWSHIPS

Major-Gen. W. H. Ogilvie has just returned to England after a visit to the United States and Canada, where he was authorized by the President and Council of the Royal College of Surgeons of England to present diplomas to the surgeons of these countries who had been awarded the Honorary Fellowship but who were unable to visit England at present.

On Oct. 30 Prof. Norman Strachan Shenstone of Toronto was admitted as an Honorary Fellow in the Governor-General's House in Ottawa. The Governor-General, the Earl of Athlone, himself an Honorary Fellow of the College, presided at the ceremony, and H.R.H. Princess Alice honoured the College by attending. A distinguished company was invited to Government House for the occasion.

On Nov. 8 Major-Gen. Ogilvie presented diplomas of Honorary Fellowship to two American surgeons, Prof. Robert Bayley Osgood and Prof. Everts Ambrose Graham. The ceremony took place in the British Embassy in Washington. His Excellency the Ambassador, Viscount Halifax, presided, and a distinguished company was invited to attend.

## Introductory Remarks by Major-Gen. Ogilvie

The Royal College of Surgeons of England stands in direct succession to a series of learned bodies who have striven, since the search for knowledge first began to replace the unquestioned acceptance of tradition, to further the science and art of Surgery. According to their lights, and within the limitations that the state of learning and material prosperity of their times imposed upon them, these guilds, societies, and corporations made it their concern to encourage the pursuit of learning, and to establish a high professional and ethical standard among their members and associates. Our College is proud of its stewardship during the years that it has been responsible for maintaining these traditions, and it has endeavoured to advance surgery in the related fields of research, of education, and of examination standards.

In research we have been helped by many generous benefactions, among which those of Bernhard Baron and Buckston Browne stand out in recent years. The Bernhard Baron laboratories occupying two floors of the College buildings in Lincoln's Inn Fields, and the Buckston Browne experimental farm in the grounds of Darwin's house in Kent, have given young surgeons a unique opportunity to follow John Hunter's famous advice, "Don't think: try the experiment." In education we have always been proud of having the best surgical museum in the world, and a library that is complete in its files of surgical books and periodicals. We have endowed lectures and demonstrations, single and in series, that provide a forum from which advances in surgery and allied sciences are made public. In examinations we are concerned with the standards of surgery and have two diplomas: the Membership of the College, which, with the Licence of the Royal College of Physicians, provides the most widely sought qualifying test in the United Kingdom; and the Fellowship, a hall-mark of surgical knowledge which is awarded after two examinations whose severity is proverbial.

The Fellowship of the Royal College of Surgeons stands high, partly because it marks the successful passage of this severe scholastic test, still more because the body of Fellows represent all that is best in the surgery of the British Commonwealth and Empire. Because any nation or society is the epitome of the qualities of its individual members, the College has always been proud to add to its ranks, as Honorary Fellows, leading surgeons of other members of the British Commonwealth of Nations and of the world. Honorary Fellowship is awarded to few. It is the highest honour the College can give, and the College has been honoured by those who have accepted it and whose names now stand on its roll. Because of the importance of the occasion, Honorary Fellows are required by custom to attend in the Council Chamber to receive their diplomas at the hands of the President, and to sign the roll of Fellows. As a Member of the Council it has been my privilege to attend several of these presentations. I felt, as many have done, the spell of a ceremony that has changed its detail and its place but has retained the tradition and very much the form of the days when Columbus first landed on these shores. The Council have decided to depart from custom and present the diploma over-seas, rather than wait for that indeterminate event, the cessation of hostilities, in order to present it in the home of the College. In making this decision, I know they have been influenced by the wish to give contemporary rather than belated recognition to the spirit of harmonious co-operation that has existed between the surgeons of our countries before, and still more during, the war, and to the scientific discoveries that the bodies which those who are with us to-day represent have contributed to the common cause.

As a senior member of the Council, I have been entrusted by the President, Sir Alfred Webb-Johnson, with the great privilege and honour of welcoming these eminent surgeons to the ranks of our Honorary Fellows.

Nov. 8, 1943: in the British Embassy at Washington

ROBERT BAYLEY OSGOOD.—Your name is a household word wherever orthopaedic surgeons are gathered together, and wherever the games of football and tennis are played throughout the world. You are a Harvard student. Throughout your life you have been associated with the Medical School of that renowned University, and by your reputation and your writings have helped to carry its name to every part of the world. Your work has been recognized in Europe by Honorary Membership of five orthopaedic societies, and by your appointment to the Hugh Owen Thomas Lectureship at Liverpool in 1925. In the first world war you served over-seas in 1917 and 1918, and in the latter year you were selected as consultant to the office of the Surgeon-General in Washington. To-day you stand in the enviable position of being recognized as one of the greatest orthopaedic surgeons in the world, and as one of the leaders of medical education, particularly of orthopaedic education, in the United States.

EVERTS AMBROSE GRAHAM.—I will not offend your modesty or strain my own memory by attempting to enumerate the many distinctions that go to make up your very remarkable record. I know that you have seven degrees; that six medals have been awarded to you; and that you have been appointed to nine different lectureships. You edit the *Archives of Surgery*, and that unique volume the *Year Book of Surgery*, to which every surgeon in every land turns for guidance. You are Professor of Surgery in Washington University and Surgeon-in-Chief of Barnes Hospital in St. Louis. You have been President of the American College of Surgeons, of the American Surgical Association, and of the Association for Thoracic Surgery, and you are now Chairman of the Committee in Surgery of the National Research Council in Washington. You have, among much fine work, made two outstanding contributions to surgery—the introduction of a method of contrast radiography in the biliary tract, and the demonstration that cancer of the lung can be cured by operation. You had the first successful case of pneumonectomy for malignant disease, and if, as I believe, that patient is alive to-day, you have by far the longest surviving cure. But your reputation among your colleagues, who have bestowed on you the highest honours in their gift, rests on a surer and more enduring foundation than that of technical contributions. Throughout your life you have striven for surgical education and the raising of surgical standards, and the high position which American Surgery now holds is in large measure due to your efforts in this respect.

Oct. 30, 1943: in the Governor-General's House at Ottawa

NORMAN STRACHAN SHENSTONE.—Your name had been familiar to me long before I had the good fortune to meet you six years ago, and indeed it is familiar to every surgeon in Britain. You had your school and university education in Toronto, and you have well repaid the teaching you received, for you in your turn have been a teacher in its medical school for thirty-five years, and your reputation, and the students you have sent out, have helped to carry the fame of its University to every corner of the world. In the first world war you served over-seas in 1916 and 1917, and returned to act as Consultant in the Department of Pensions and National Health in 1918, an office you have held ever since. Outside Toronto you are known chiefly for your contributions to thoracic surgery—it would be more accurate to say as one of the founders of that branch of surgery, for it was your technical contributions that first established the operation of lobectomy as a safe and justifiable procedure. In Toronto itself you are known as one who has always placed the welfare of others above his own, who has published little but has preferred to let his views pervade the surgical teaching of his university, and who has worked for his juniors rather than asking them to work for him. I know that they and your colleagues will rejoice at the honour conferred upon you.

For reasons of paper economy the 29th annual report of the Board of Control is not being printed or put on public sale during the war. At the end of 1942 the total number of persons suffering from mental disorder notified as under care in England and Wales was 147,596 (63,531 men and 84,065 women), of whom nearly 87% were being treated in institutions provided by local authorities. This was a decrease of 3,516 during the year, compared with a decrease of 4,048 during 1941. The average annual decrease for the five years ended Dec. 31, 1942, was 1,952. This contrasts with an average annual increase of 1,691 during the last five years of peace. Discussing the effect of war conditions on the incidence of mental disorders, the report states that the number of new admissions to public mental hospitals showed an increase of 340 on the previous year. This was due to a rise of 944 in voluntary admissions, less a reduction of 149 in temporary admissions and 455 in admissions under certificate.



## NEW YEAR HONOURS

The names of the following members of the medical profession were included in a New Year Honours List published in the *London Gazette* on Jan. 1:

*Knighthood*

Prof. FRANCIS RICHARD FRASER, M.D., F.R.C.P. Director-General, Emergency Medical Service.  
WALTER HAWARD, O.B.E., M.B., B.S. Director-General of Medical Services, Ministry of Pensions.  
Col. GEORGE WYKEHAM HERON, C.M.G., C.B.E., D.S.O., M.R.C.S., L.R.C.P. Colonial Medical Service, Director of Medical Services, Palestine.  
THOMAS JONES, M.R.C.S., L.R.C.P., J.P. Chairman of the Anglesey Education Committee.

*C.B. (Military Division)*

Major-Gen. ALEXANDER GORDON BIGGAM, O.B.E., M.D., F.R.C.P., late R.A.M.C., Honorary Physician to the King.  
CHARLES MAX PAGE, D.S.O., M.S., F.R.C.S. Lieut.-Col. (Acting Major-Gen.), R.A.M.C.  
CHARLES PUTNAM SYMONDS, M.D., F.R.C.P. Acting Air Commodore, R.A.F.V.R.

*C.I.E.*

Col. THOMAS CRAWFORD BOYD, F.R.C.S.I., I.M.S. Inspector-General of Civil Hospitals, United Provinces.  
Lieut.-Col. AUGUSTINE SARGOOD FRY, F.R.C.S.Ed., I.M.S. Professor of Operative Surgery, King Edward Medical College, Lahore.  
Lieut.-Col. ARTHUR DENHAM WHITE, F.R.C.S., I.M.S. (ret.).

*C.V.O.*

FRANCIS HUGO TEALE, M.D., F.R.C.P.

*C.B.E. (Military Division)*

BASIL CEDRIC ASHTON, M.B., Ch.B. Col. (Temp. Brig.), I.M.S. Honorary Surgeon to the King.  
LANCLOT MILLER CORBET, M.B., B.S. Acting Group Capt., R.A.F.O.  
FREDERICK HARRIS, M.C., M.B. Lieut.-Col. (Temp. Col.), R.A.M.C.  
HENRY BRICE PARKER, D.S.C., M.B., B.S. Surg. Capt., R.N. (ret.).

*C.B.E. (Civil Division)*

CHARLES HERBERT BEST, M.D., D.Sc., F.R.S., F.R.C.S. Co-discoverer of insulin with the late Sir Frederick Banting of Toronto.  
WILLIAM LESLIE BURGESS, M.D., F.R.C.P.Ed., D.P.H. Medical Officer of Health, Dundee.  
GEORGE LISSANT COX, M.D. Chief Tuberculosis Officer, Lancashire County Council.  
ALAN NIGEL DRURY, M.D., F.R.S. Lately Member of the Scientific Staff, Medical Research Council.  
DUNCAN ARCHIBALD LAMONT GRAHAM, M.B., F.R.C.P. Dean, Department of Medicine, University of Toronto; former President, Royal College of Physicians and Surgeons of Canada.  
Prof. SYONEY ALFRED SMITH, M.D., F.R.C.P.Ed. Chairman of the Scottish Central Medical War Committee. For services to Civil Defence.  
CLAUDE EDWARD TANGYE, M.D., D.P.H. County Medical Officer of Health, Wiltshire. For services to Civil Defence.  
MAURICE LAWRENCE TRESTON, F.R.C.S., F.R.C.O.G. Col., I.M.S. Inspector-General of Civil Hospitals, Burma.

*O.B.E. (Military Division)*

GUY PASCOE CROWDEN, T.D., M.R.C.P. Lieut.-Col., R.A.M.C. T.A.  
CECIL WOOD FLEMING, D.M., M.Ch., F.R.C.S. Wing Cmdr. (now Acting Group Capt.), R.A.F.V.R.  
ROBERT WILLIAM HIGGINS, M.B., B.Ch. Surg. Cmdr., R.N.  
JOHN EDWARD GEORGE MCGIBBON, M.B., B.S. Squad. Ldr., A.A.F.  
EOGAR ALEXANDER PASK, Acting Squad. Ldr., R.A.F.V.R.  
JAMES MACLURE SMELLIE, M.D., F.R.C.P., Lieut.-Col., R.A.M.C., T.A.  
PAUL ALFRED TURNER SNEATH, Lieut.-Col., R.C.A.M.C.

*O.B.E. (Civil Division)*

PETER PAUL DEBONO, M.D., F.R.C.S. Professor of Surgery, Malta University.  
JOSEPH RICHARD GREGORY, M.D. Director, Kenya Branch, British Red Cross Society.  
CHARLES MERRILL SCHAFETER, M.B., F.R.C.S.Ed. Surgeon working in Church Missionary Hospitals in Persia.  
HAROLD EDWARD SKEETE, M.D., C.M. For public services in Barbados.

LEONARD ANTHONY PAUL SLINGER, M.B., B.Ch. Colonial Medical Service, Resident Surgeon, Victoria Hospital, St. Lucia.  
MARGARET WILKIE, LADY BHOORE, M.B.E., M.B., Ch.B. Central India.

*M.B.E. (Military Division)*

CLARENCE MELVILLE BETHUNE, Major, R.C.A.M.C.  
JOHN WEIGHTMAN BRIDGE, Major, R.C.A.M.C.  
RICHARD JAMES CAIRNS, M.B., Ch.B. Capt., R.A.M.C.  
ALFRED LEONARD CRADDOCK, M.B., B.S. Capt. (Temp. Major), Burma Army.  
ERIC RUDOLPH HILL, Lieut. (Acting Capt.), I.A.M.C.  
THOMAS MILLER, V.D. Major, R.C.A.M.C.  
FRANCIS LESLIE POTTER, Capt., R.A.M.C.  
CHARLES MARTIN ROW, Capt. (Temp. Major), R.A.M.C.

*M.B.E. (Civil Division)*

RATNAKAR NARAYAN BHAINDEKAR, M.B., B.S. Divisional Warden, A.R.P., Dadar West Division, Bombay.  
DAVID JAMES MASTERTON MACKENZIE, M.B., Ch.B. Acting Principal Medical Officer, Bechuanaland Protectorate.  
MOHAMED ALI RANA, M.R.C.S., L.R.C.P. For public services in Kenya.

*Kaisar-i-Hind Gold Medal*

BASIL FRANKLIN EMINSON, M.B., B.S. Lieut.-Col., I.M.S. (ret.). Civil Surgeon, Karachi, Sind.  
REGINALD ARTHUR HAYTHORNTHWAITHE, B.M., B.Ch. Major, I.M.S., Civil Surgeon, Khasi and Jaintia Hills, Assam.  
JOHN LOWE, M.D. Co-ordinator of Research, School of Tropical Medicine, Calcutta.  
JEAN MURRAY ORKNEY, M.B., Ch.B., D.P.H. Women's Medical Service, Director, Maternity and Child Welfare Bureau, Indian Red Cross Society.

Our readers will also learn with gratification of the knighthood to be conferred on Capt. G. S. Elliston, M.P., son of a former President of the B.M.A. and brother of the late Guy Elliston Financial Secretary and Business Manager of the Association; and on Prof. J. C. Drummond, D.Sc., scientific adviser to the Ministry of Food.

## Medico-Legal

## DOCTOR ACQUITTED OF RAPE

At his second trial, which lasted four days and ended on Dec. 16, Dr. Krishna Morishwar Pardhy, F.R.C.S., a Brahmin aged 68, was acquitted of the rape of Mrs. Lucy May Pearson. At his first trial in July the jury failed to agree. According to the newspaper report<sup>1</sup> Mr. and Mrs. Pearson had known him for some years and had recommended relatives to him: he practised at Elvetham Road, Edgbaston, Birmingham, as a gynaecological surgeon. The case for the prosecution was that he was examining Mrs. Pearson in his consulting-room, and that her husband was waiting in the same room behind a screen. The report leaves so many gaps that it is difficult to form a picture of what the couple really alleged in evidence, but apparently their evidence was to the effect that the doctor made sexual connexion with Mrs. Pearson without her becoming aware of it for some little time; when she realized what he was doing she called to her husband, who came out, caught the doctor by the wrists, and called him a swine. The doctor at once stoutly denied misconduct, and in his evidence said he had practised in Birmingham for 35 years, had suffered from prostatitis for 12 years, and at the time of the incident was tired after performing six operations. As the couple were leaving the house, he said, Mr. Pearson drew some money from his pocket, jingled it, and said, "Mr. Pardhy, you are not a psychologist." Mrs. Pearson was described by her own doctor as a placid, sensible woman. After an absence of 45 minutes the jury found Dr. Pardhy not guilty. Medical men are always being advised not to examine a woman without the presence of a third person. This case shows that for safety the third person must be an assistant of the doctor.

<sup>1</sup> *Birmingham Post*, Dec. 15, 16, and 17, 1943.

O. C. Lord and M. J. Stewart (*J. Laryng. Otol.*, 1943, 58, 263) who record a personal case, state that osteoclastoma of the temporal bone is a very rare disease, only two previous well-authenticated cases having been described. Their patient was a woman, aged 50, in whom the clinical duration of the disease was just over three years. The histological diagnosis was made two years before death by examination of a recurrent nasal polypus. Treatment by partial excision and radiation gave good results for a time. At necropsy the tumour was found to have extended to the base of the skull and had invaded the cerebellum.

## Correspondence

### Sciatica

SIR.—Sir Arthur Hurst's provocative essay on the treatment of sciatica (Dec. 18, p. 773) is both timely and chastening. I would suggest, however, that he has done scant justice to the part played by orthopaedic surgeons in the attempt to place the sciatica problem on a rational basis. It is many years since orthopaedic surgeons began to insist that sciatica is a symptom and not a disease; that true sciatic neuritis is rare; that sciatic pain is often referred pain (e.g., in osteo-arthritis of the hip); and that the causal lesion in a large group of cases is to be discovered in that complex system of articulations embraced by the lumbar spine and sacro-iliac joints. In common with physicians and neurologists, orthopaedic surgeons have also long been aware that many patients with backache and sciatica are the victims of a formidable psychological disturbance.

From the special standpoint of the orthopaedic surgeon the conventional diagnoses of lumbago and sciatic neuritis were first challenged nearly forty years ago by the Boston Orthopaedic School (Goldthwait and Osgood<sup>1</sup>). From this emerged the concept of sacro-iliac "strain" and lumbo-sacral "strain" as clinical and pathological entities to be treated by rest, fixation, forced mobilization, or in the last resort by operative fusion, in accordance with the special circumstances of the individual case, and not in accordance with the tenets of rival schools of orthopaedic practice. As time went on there were many successes, but far too many failures. In consequence orthopaedic surgeons began to look for a more satisfying explanation of the backache-sciatica symptom complex. During this period attention was directed to two contributory aetiological factors—abnormal posture and anatomical variations at the lumbo-sacral junction. We now attach little significance to the role of such anatomical variations as unilateral sacralization, but abnormal posture is a factor to be reckoned with in any re-educational programme for the treatment of backache and sciatica.

The next phase witnessed the intervention of the Italian school of orthopaedics when Vittorio Putti (1927) of Bologna, developing the notion of Sicard, first put forward the view<sup>2</sup> that sciatic pain—and more especially that striking clinical picture, sciatic scoliosis—was a symptom of arthritis of the interarticular joints of the lumbar spine. For the treatment of this condition Putti used the conservative measures of heat, rest, and fixation in plaster, but in intractable cases practised the operation of removal of the diseased articular facets—a procedure designed to decompress the irritated nerve roots lying in the intervertebral foramina. Sir Arthur Hurst has apparently overlooked the fact that the "vertebral arthritis theory" is thus at least sixteen years old, and that Mr. Blundell Bankart, who at the present time is almost alone in his unqualified support of this theory, has never claimed it as his own creation. Like sacro-iliac and lumbo-sacral strain, vertebral arthritis as a common cause of sciatica has in turn had its day. No one would deny the existence of these particular lesions, but we are compelled to believe that they form a minority group.

And now at long last a more concrete lesion of the lumbar spine has come to light—the disk protrusion. This lesion is a manifestation of a disturbance of the mechanics of the lumbar spine comparable in some respects to internal derangement of the knee-joint, and thus generically an "orthopaedic" lesion which may not necessarily require operative treatment, as pointed out by C. P. Symonds.<sup>3</sup>

In the comparatively short space of time which has elapsed since the pioneer joint contribution of Mixter, a neurological surgeon, and Barr, an orthopaedic surgeon, neurosurgeons in America and Great Britain have already reaped a rich harvest of cures by removal of the projecting disk fragment in cases selected from the large numbers of sciatica patients who continue to find their way to orthopaedic surgeons. In the majority of orthopaedic clinics to-day patients with backache and sciatica

are carefully studied by surgeons fully aware of the manifold causes of these symptoms. Heaven is thus often exceedingly helpful to the victims of sciatica, despite Sir Arthur Hurst's quotation from an unknown writer which prefaces his essay! I am accustomed to teach my students that the sciatica patient falls into one of five main clinical groups, and that each group should be considered in turn in the process of elimination which leads to diagnosis: (1) pelvic visceral disease; (2) bony lesions of the lumbar spine, pelvis, and femora—i.e., lesions essentially destructive in type (inflammatory or new growth); (3) joint lesions of the spine, pelvis, and hips (in this group the prolapsed disk has displaced the sacro-iliac strain and vertebral arthritis as the pivotal lesion); (4) central nervous lesions—e.g., cauda equina tumours; (5) pseudo-sciatica—fibrositis of the fascial, ligamentous, and muscle masses in the lumbar region, buttocks, and thighs.

In the *Army Medical Department Bulletin*<sup>4</sup> the fibrositic group is regarded as numerically important. This at the present time seems to be the outstanding controversial issue in the problem of the causation of sciatica.—I am, etc.,

Manchester.

HARRY PLATT.

SIR.—I was particularly interested in Sir Arthur Hurst's essay on sciatica, because my own comparatively limited experience of the complaint had led me to a somewhat similar view. Some time ago I had to deal with about half a dozen more or less intractable cases of sciatica all of which had experienced some unusually severe emotional strain shortly before the onset of pain. Typical of these was a university professor who, coincident with his retirement, lost a dearly loved wife. Then, while convalescing in a nursing-home, he had contracted sciatica just as he was beginning to feel he could face life without its old associations. I regret to say that at the time he told me his story my knowledge of sciatica had not been "debunked," so that I missed the obvious clue to its cause and submitted him to one useless "orthodoxy" after another. However, the coincidence of these cases served to draw my attention not only to the possibility of a psychic origin but also to the probable way this produced the common effect.

There seemed to be no reason to quarrel with accepted causes of sciatica, which might well be present in many people with or without the complaint. Certainly one would not omit thorough external and rectal search for these. But whatever such examinations might disclose it appeared that the actual onset of pain was more likely to be determined by some factor that increased the patient's perception of it than by any real event of a purely organic variety. In my cases I was accordingly led to suppose that pain arose when there existed an urgent need for escape from some unbearable memory under circumstances that provided insufficient distraction of a less morbid kind. (Presumably this incompatible "memory" need not be of recent origin or as well known to either patient or doctor as it happened to be in my cases.) Then as soon as consciousness is fully focused upon the sciatic pain it is in turn greatly intensified by all the muscular and postural adjustments by which the body vainly endeavours to seek relief. Such an aetiology and sequence of events is well recognized in relation to pains in all parts of the body, but, as Sir Arthur Hurst points out, sciatica must frequently belong to this category, judging by the variety of causes and treatments assigned to it.

I would like to extend Sir Arthur Hurst's observations on treatment a little further than his recommendation for some form of suggestion. The premises on which this is based seem to call for attempts to eradicate the malady as well as the pain by defining its nature and cause to the patient. For instance, one of the cases to which I have referred was a man of about 50 who had done little or no work since the last war due to injuries sustained and the fact that it had left him a nervous wreck. This man suffered severely for nearly a year from sciatica that would not yield to tablets, medicine, injections, physiotherapy, or anything else. The masseuse obtained a little relief for a time mainly by postural correction and relaxation of dorsal muscular spasm, but really nothing seemed to be much use however confidently it was presented to the patient. Now shortly before the onset of the pain the patient's father had died in an infirmary, and I found that he was

<sup>1</sup> *Boston med. surg. J.*, 1908, No. 21-22.  
<sup>2</sup> *Lancet*, July 9, 1927. (Ad. Lomboartrite e sciatica vertebrale, Bologna, 1936.)  
<sup>3</sup> *Sciatica*, Medical Annual, 1943.

<sup>4</sup> *Army Medical Department Bulletin*, No. 16 (Oct. 1942).

haunted by a conviction that he had been instrumental in his father's death. A complete explosion of this fallacy, together with detailed explanation of how he had been seeking refuge in pain, was followed by its disappearance in the course of a couple of weeks.

However, quite apart from one's own personal experience, it seems to me that if one accepts Sir Arthur Hurst's very convincing arguments in favour of a functional interpretation of sciatic pain it is no less incumbent on one to find and eradicate the cause than if one believed this to be of an organic nature. If simple suggestions of cure succeed in overcoming the pain one can hardly feel confident that one has done any more than suppress a symptom, however gratifying that may be. In dealing with pain arising from a possibly progressive organic disease such complacency would generally be regarded as quite unscrupulous. In that case attempts of any sort solely directed towards relief of pain would be regarded as nothing short of quackery unless the case had been proved to be hopeless. Yet if in the absence of organic disease a case yields to suggestion one seems to be exonerated from knowing or doing anything more about it until the almost inevitable recurrence of identical or other symptoms of the disorder.—I am, etc.,

Eye, Suffolk.

J. SHACKLETON BAILEY.

SIR,—Discussion on the treatment of a symptom common to many disorders is seldom illuminating. There would be no more difficulty in making fun of the treatment of headache than Sir Arthur Hurst finds in ridiculing the treatment of sciatica. The relief of headache may demand operations, drugs, rest, exercises, or psychotherapy; no one would discern anything unreasonable in that.

Nowadays sciatica is largely employed as a synonym for pain felt to radiate down the back of the lower limb from above. A medical definition consonant with this usage would be "pain common to various deep-seated lesions placed at the proximal extent of the fourth lumbar to second sacral segments." The alternative nomenclature is to regard sciatica as a diagnosis and confine its use to cases showing signs of diminished conduction along the sciatic nerve. This usage cannot be recommended, since it results in several inconsistencies—namely, that in about half of all cases of sciatic periradicularitis no signs of a parenchymatous lesion ever appear; that two entirely distinct conditions (sciatic neuritis and sciatic periradicularitis) go by the same name; that cases of pure backache caused by sciatic periradicularitis have to be called sciatica. The nomenclature that commends itself to me is: (a) sciatica—the name of a pain; (b) sciatic periradicularitis (which should be divided into frictional and non-frictional)—affections primarily of the sheath of the sciatic nerve-roots; (c) sciatic neuritis—primary affections of the parenchyma of the sciatic nerve.

The rational treatment of sciatica is that of the causative lesion. It differs in no way whether merely local or much referred pain is present. A list of the commoner lesions setting up unilateral sciatica and their appropriate treatment follows:

*Deep lumbar fasciitis*: deep massage; if this fails, division of the affected part of the fascia.

*Gluteal myositis*: deep massage.

*Gluteal fasciitis*: deep massage.

*Sacro-iliac strain*: corsetry, preceded if necessary by manipulative reposition of the joint.

*Sacro-iliac arthritis*: local deep x-ray therapy.

*Non-frictional sciatic periradicularitis*: epidural local anaesthesia.

*Frictional sciatic periradicularitis*: manipulative reduction of the displaced fragment of intervertebral disk; if this fails, immobilization; if this fails and the symptoms warrant, operative removal of the protruded disk.

*Intermittent compression of the fifth lumbar nerve-root*: rest; if this fails, consideration of Bankart's decompression of the root by removal of the lateral articulation.

*Sciatic neuritis*: removal of the cause when it can be found—e.g., poisoning with a heavy metal or alcohols. Many cannot be eliminated—e.g., secondary deposits.

*Functional pain*: psychotherapy.

There are many pains which give rise to very little by way of physical signs; sciatica is one of them. None the less, the pain of sciatica is very real. The examination of the patient is difficult and tedious. It must disclose whether he is suffering from (a) a nervous lesion and, if so, which sort; (b) a muscular,

fascial, or ligamentous lesion, and, if so, exactly where; (c) nothing organic. Only on the basis of an accurate diagnosis can effective treatment be offered for this common symptom.—I am, etc.,

London, W.1.

JAMES CYRIAX.

### Operation for Prolapsed Intervertebral Disk

SIR,—I am quoted by Sir Arthur Hurst in your issue of Dec. 18 as convinced that in Service patients the operation for prolapsed intervertebral disk has proved unsuccessful in getting men back to duty. This was the opinion which I expressed in a discussion at the Royal Society of Medicine two years ago. Since that time, as the result, I believe, of better selection of cases, improved surgical technique, and a more carefully planned convalescence, the results of operation have been much better than they were during the period from which my earlier experience was drawn. It is to be hoped that surgeons who have followed up their cases will soon be able to give us details of the percentage of patients able to return to, and remain at, full duty after operation. We need also a follow-up of a comparable series treated by immobilization before we can improve our judgment as to the circumstances in which operation is desirable. In certain cases I believe it offers the best chance of return to duty.—I am, etc.,

Oxford.

C. P. SYMONDS.

### Tuberculosis in Belgium.

SIR,—In your issue of Dec. 18 (p. 800) you give an account of the question put by Mr. Oldfield to Mr. Dingle Foot in the House of Commons on Dec. 7 with regard to the increase in the number of registered cases of tuberculosis in Belgium. The number has risen from 69,079 in Dec., 1941, to 109,511 in Feb., 1943—that is to say, from 8.3 per 1,000 of the population to 13.3. While accepting the latter figure, Mr. Foot remarked that slight cases were included, because "anyone might apply to his doctor for a certificate showing that he was suffering from tuberculosis."

According to the evidence which has reached me from Belgium since 1942, and which has recently been confirmed by Belgian doctors who have succeeded in escaping from Belgium, the registration which entitles a patient to a supplementary ration is extremely difficult to obtain and is not granted merely on the production of a doctor's certificate. Either an x-ray photograph showing internal lesions must be added or conclusive sputum specimens. In a case of tuberculosis of the eye the doctor was unable to obtain a supplementary ration card for his patient because neither a photograph nor the sputum would be evidence.

The estimate of one-third of the children under 18 suffering from tuberculosis and other diseases is quoted in a report issued in May, 1943, by the American Board of Economic Warfare. It is based on information emanating from Sweden. It is not the first time that Swedish and Swiss observers have confirmed reports received by the Belgian Red Cross in London.—I am, etc.,

Radlett.

EM. CAMMAERTS.

### Treatment of Obstetric Shock

SIR,—I was most interested in Dr. I. S. Fox's contribution (Dec. 18, p. 781) on the value of immediate blood transfusion in primary obstetric shock.

He describes in detail a case following a short normal uncomplicated delivery, which responded very satisfactorily. If I may be allowed one point of criticism, however—expression of placenta by Credé's or any other method should not be attempted so quickly after delivery. Another point—I doubt whether the condition is as rare as he suggests, as I have had two similar cases in a short series of approximately 300 deliveries.

Both patients were primiparae with normal histories and pregnancies, who delivered spontaneously after short and easy labours, one in fact being B.B.A. Shortly after delivery, with normal blood loss and before any attempt was made to express the placenta, both cases collapsed with obvious and severe obstetric shock. The usual domestic antishock measures were instituted immediately without much response, except that in

one case intracardiac adrenaline was successful in restoring cardiac rhythm. Pituitary had not been used in either case. An urgent summons for the local "flying squad" was answered quickly, and transfusion of whole blood was most successful.

I agree whole-heartedly with Dr. Fox as to the value of the "flying squad" in these and similar cases, and would urge that each large centre of population should have the benefit of this service, as such cases are not fit for removal to hospital.—I am, etc.,

Newcastle-upon-Tyne

IRVING STOLL.

### Immediate Blood Transfusion in Obstetric Shock

SIR,—I was very interested in the article by Dr. I. S. Fox under the above title (Dec. 18, p. 781). Several similar cases have occurred in this hospital where there was severe shock with a blood pressure of 70, 50 mm. Hg in association with little blood loss and a retained placenta. Immediate transfusion with plasma and whole blood in one case completely failed to relieve the condition. It was then decided to remove the placenta manually under gas-and-oxygen anaesthesia, and within 10 minutes of the removal the pulse had improved greatly and within 20 minutes the blood pressure had risen to 110/60 mm. Hg. In all cases of obstetric shock in the presence of a retained placenta with little blood loss prompt manual removal of the placenta has improved the condition immediately without a transfusion.

The exciting cause of the shock appears to be a histamine release from the partially separated placenta and absorption into the maternal circulation, and removal of the placenta cures the condition. In the reported case, shock might also have been due to injudicious use of Credé's method, which in itself is capable of producing shock. The rationale of whole-blood transfusion is difficult to understand, and plasma or serum in any case ought to be sufficient to combat shock in the absence of bleeding. It appears to be rather a waste of whole blood, which should be reserved for cases requiring haemoglobin because of severe anaemia either present before delivery or due to bleeding.—I am, etc.,

Norfolk and Norwich Hospital.

W. P. HIRSCH.

SIR,—I read with interest the article by Dr. I. S. Fox on immediate blood transfusion in obstetric shock as I had an almost identical experience earlier in the week.

Mrs. X., 2 para aged 32, started in labour about 10 p.m. on Dec. 13, 1943. I was sent for at 1 a.m. on the 14th and delivered her of a baby weighing 9½ lb. at 2.10 a.m. She had terminal chloroform anaesthesia when the head was on the perineum, and the labour otherwise was quite natural, no instruments being used. There was no laceration of the perineum, and bleeding was minimal. At 2.30 a.m. I attempted gently to express the placenta by Credé's method, but was unsuccessful, so desisted and sat down to wait. Five minutes later the patient fainted. There was no further bleeding and the uterus was quite firm. The foot of the bed was raised, hot-water bottles applied, coramine injected. She came round, but kept threatening to faint. At about 3 a.m. I expressed the placenta, and the patient said she felt all right. There was very little further bleeding. I gave her 0.5 c.cm. of vituritrin at 3.15 a.m., and as she seemed quite settled with a pulse of good volume and about 80 per minute I left her about 20 minutes later. However, within half an hour I was recalled by phone as the nurse said she had "gone off" again.

On my return the nurse was already giving rectal saline, but her pulse was very faint, the patient's colour greyish, and the pupils widely dilated. I called out the local "flying squad," but when it arrived the patient's condition was better, though she still tended to faint. The obstetric specialist decided, as it was obstetric shock and not due to haemorrhage, to give a pint of plasma, and after two or three complaints by the patient of feeling sick and faint during its administration the pulse improved and she felt much better, and she had no further trouble.

I also was at a loss to ascribe a cause for the condition, and it was my first experience of it in 20 years' practice. Her uterine contractions had been good, it was a gentle labour, and there was little loss of blood. I thought it had something

to do with the retention of the placenta, but I also felt that there was some psychological factor, as her husband was away in the R.A.F., her other child, aged 2 years, was ill with a cold, she was alone in the house with this sick child for 2 days (the day before and the day—the 12th—on which the confinement was expected), and her neighbours on each side of her house were all suffering from influenza, so that she had been very anxious as to how she was to get in touch with the municipal midwife. Fortunately, on the 13th her step-mother, who was to have looked after her, was sufficiently recovered to come.—I am, etc.,

A. BARLOW.

### Detection of Death under Anaesthesia

SIR,—In Mr. Harold Dodd's article on blood-pressure readings in general surgery (Dec. 25, p. 811) I note that he conforms to modern surgical procedure by having blood-pressure readings taken before, during, and after operations, as has been done at most good hospitals, I believe, for many years, and certainly at my own. I am a little disturbed, however, to read of his experiences when operations are done without blood-pressure observations, for he records that on three occasions death on the table was first detected by the surgeon. I recommend, with considerable confidence, the rule that a surgeon should only employ an anaesthetist who is at least as nimble as he is at detecting the onset of an acute attack or "mors" without the aid of a blood-pressure cuff.—I am, etc.,

London, W.1

JOHN HOSFORD.

### Heroin during Labour

SIR,—I was interested to read in your issue of Dec. 18 (p. 795) that Dr. W. Edwards had found trilene so efficient in producing analgesia in obstetrics. It has to be borne in mind, however, that, since trilene has only recently been introduced as an anaesthetic agent, our knowledge of its toxic effects may not yet be complete. Three cases of permanent trigeminal paralysis following the use of trilene were described only last month in the *Journal* (Dec. 4, p. 713).

During the past five months every case admitted to this hospital has been given heroin during labour, and I have come to the conclusion that this is the most generally useful drug in normal labour. When the cervix is 2 to 3 fingers dilated 1/6 gr. heroin is injected, and this is followed by 1/12 gr. heroin when the cervix is almost fully dilated and only the anterior lip remains to be taken up. This is the minimum amount which is given. In a long first stage additional doses of 1/12 gr. heroin are given. If it is found that the cervix is almost fully dilated or that the second stage has begun when the case is admitted, 1/6 gr. heroin is given straight away, no account being taken of when delivery is expected to take place.

With this technique, which has been employed now in over 200 cases, the pains of both the first and second stages are adequately relieved, and in the vast majority of cases no supplementary anaesthetic is required at all. After the first dose of heroin the patient either sleeps for a while or enters into a pleasant doze. The importance of relaxation, as expounded by Dr. Grantly Dick Read, is not overlooked, and every patient is taught and encouraged to lie relaxed and still during the first-stage uterine contractions. Bearing-down efforts in the second stage are not impeded in the slightest. The mother does not cry out pitifully for relief when the head is on the perineum. There is no moaning, no groaning. The child cries spontaneously when it is born. I have on many occasions given 1/6 gr. heroin to women admitted in the second stage of labour. Delivery has taken place at all times from ten minutes to two hours later, and in not one of these cases did the child fail to cry lustily and spontaneously.

Not only is the normal course of labour not interfered with, but the method is pleasant, as heroin produces a euphoria unrivalled by any other narcotic drug, and the disagreeable features of inhalation anaesthesia are avoided. Patients can be left alone after being given heroin, a factor which makes the method ideal for domiciliary midwifery. In my opinion the heroin technique, as outlined above, could be safely entrusted to midwives.—I am, etc.,

JAMES ROSS,  
Resident Obstetrician.

Emergency Maternity Hospital, Ilkley.

### Industrial Lead Poisoning

SIR,—I was most interested and gratified by Dr. Lane's letter (Dec. 11, p. 760). I had been rather shaken by the comments in the leading article on industrial plumbism referred to by Dr. Lane, inasmuch as I have proved to my own satisfaction the value of regular and periodic punctate basophilic counts in the lead works with which I have been associated as appointed surgeon for the past two years. Ninety-five per cent. of the employees—of whom there are about 600—submit willingly to the taking of their blood, and each man working where the hazard is known to be particularly great has his blood examined every 3 to 4 weeks. The result of the count determines the advisability or otherwise of the transference of the man to a part of the works where the risk is less. Again, blood counts for punctate basophilia are of the utmost value to the management, for if it is discovered that a batch of workmen on one particular process suddenly develop a markedly raised count the conclusion is obvious—the ventilation at that process is at fault, and this must be rectified.

I maintain that with the co-operation of the management the lead-works doctor is in a position to reduce industrial plumbism in such works to a minimum. I might add that in the works alluded to in this letter there has not been a single case of plumbism in 18 months. The blood cells are counted with the aid of dark-ground illumination; the granules are so much easier to define than when the direct method is used, and consequently much time and eyestrain are saved.—I am, etc.,

Newcastle-upon-Tyne.

H. C. WRIGHT.

### Shock Treatment of Mental Disorder

SIR,—Having been privileged to be a co-introducer of electrical convulsion treatment to this country in 1939, it happens also that I am a practising psychotherapist upon limited but intensive Freudian analytical lines; I therefore claim a measure of impartiality in venturing to reply to Dr. Winnicott's observations upon this twofold topic (Dec. 25, p. 829).

I fear there is a basis of truth, which should not, however, be exaggerated, in your correspondent's contention that the even course of medical evolution has been interrupted and set back by the widespread application of convulsion therapy. Should this be the case it is a regrettable, though perhaps to some extent inevitable, sequence of events largely owing to the inherent difficulties associated with psycho-analytical practice, particularly where time and money are concerned. Among psychiatrists generally there has been and still exists a failure to grasp and appreciate the great importance and fundamental significance of that arduous and prolonged psycho-analytical approach, confronted as it is by the imperative necessity of the analyst himself undergoing analysis. To me it becomes increasingly clear that convulsion therapy, when indeed not self-sufficient, should be regarded as an adjuvant means of promoting accessibility to later psycho-analytical investigation and treatment.

Regarding the alleged harmfulness of convulsion therapy—a view nowadays quite unusual—I would say that over four years of clinical experience, including the completion of over 8,000 major inductions with only two minor fractures and no untoward sequelae, has convinced me of its very wide margin of safety. To protest against convulsion therapy upon ethical grounds in the face of such findings, and when such treatment *per se* so commonly results in speedy and sometimes lasting improvement, suggests an emotional bias on the part of your correspondent, whose main thesis I am, nevertheless, ready to support. Because it is founded upon strict laws of evidence, sooner or later the essential soundness of psycho-analysis will surely prevail, both against inherent difficulties and also the vast wall of ignorance and prejudice which hinders its acceptance. Practicability and ease of administration, together with the likely promise of speedy results, have ensured the success of convulsion therapy; but psycho-analysis is much more than a therapy: it is nothing less than a science in the making. Its methods, necessarily slow and laborious, are unspectacular, but they offer in return knowledge and understanding of the mind, also therapeutic possibilities where all else fails.

It is indeed unfortunate from the standpoint of science that the value of the analytical approach and convulsion therapy

varies inversely with their practicability. In the ready practicability of convulsion therapy lies its immediate advantage, but also a certain kind of danger; this latter, however, is not a physical danger to the subject but one of therapeutic superficiality by the operator, who is tempted to be satisfied with perhaps mere palliation and to disregard that proper investigation and furtherance of understanding which alone are worthy of the name of science.

In questions of therapy, however, there is a need to be practical as well as idealistic, and to remember that the one essential characteristic of a successful therapy is its power to ameliorate the condition of the patient. There is no room for exclusiveness where multiform successful treatments are concerned; the determining factor in the choice of any particular treatment will always lie in the practicability of its application. It behoves us nevertheless to place first things first, and to maintain a proper perspective and a sense of relative values. As regards these two approaches to treatment, there surely can be no room for doubt as to their greatly differing significance and value to the scientist. The priority of importance of the psycho-analytical approach, save as a clinical method of ready and widespread applicability, is altogether overwhelming.—I am, etc.,

Warrington Park Hospital.

WM. H. SHEPLEY.

SIR,—I have read with amazement Dr. Winnicott's remarkable letter dealing with the above subject. Although the *modus operandi* of this form of treatment is still in doubt there is surely no excuse for describing it as "a mediaeval attempt to drive out evil spirits." The author is apparently under the impression that fear is the operative factor. In the cardiazol method of inducing convulsions there was a reasonable doubt as to the part played by fear, but in electrically induced convulsions fear does not or should not exist. If the patient is afraid, it is because of some ill-advised description of the treatment, such as appeared in the lay press and was most justifiably criticized by Dr. T. M. Cuthbert. There is surely no question of "inflicting pain" on the patient, considering the fact that most patients after an induced convulsion will firmly maintain that they have received no treatment and will confabulate in a remarkable manner in order to explain away their period of amnesia. The following description of the treatment by an intelligent patient is typical. In several letters to friends he stated: "This new electric treatment is marvellous. They connect headphones to your head and you go off to sleep for half an hour. On awakening, you feel very fit."

Dr. Winnicott refers to this form of treatment as if it were still in the experimental stage. The fact that it has raised the recovery rate in the depressive psychoses by over 60% should provide sufficient evidence of its efficacy. Indeed, it is generally agreed among psychiatrists that it is almost specific in this form of mental illness. Are we therefore being asked to abandon it merely because it is alleged to be empirical? Is not the statement about "ethical implications" rather suggestive of the literature published by the various antivivisection societies? If it is rational for the profession to oppose such literature strongly, it should also be rational for it to oppose a similar type of propaganda, even when this is initiated by one of its own members.—I am, etc.,

W. LIDDELL MILLIGAN.

City Mental Hospital, Newcastle-upon-Tyne.

SIR,—Dr. D. W. Winnicott (Dec. 25, p. 829) raises an important set of problems. My reaction to them from experience in several hospitals is as follows:

(1) I had always had a lingering fear lest the electrocution chair might be an agonizing prelude to death. After giving a large number of shock treatments my mind is at rest. Complete unconsciousness is instantaneous.

(2) I have found no experienced teachers in any mental hospital. The rationale is not taught and is probably not understood by those who teach the technique. A new man is taught how the machine works, and with the usual warning about weak hearts and full stomachs he is left to get on with the treatment.

(3) At present I know of no body of statistics which have been compiled as to such things as influence on temperature, effect on pupil reaction, mnemonic measurements resulting immediately, and for 24 hours or more, after treatment.



(4) So far as I know there are no records of any observations which have been made over a long series of cases, by which one can learn how to make a diagnosis as to the suitability of any case for treatment, and of the reason why a certain percentage of selected cases improve temporarily, others improve over longer periods, and others show no sign of progress.

(5) The treatment has been so vulgarized by the Press that certain private mental hospitals advertise their use of this treatment as a method of attracting patients. Friends and relatives are beginning to think all is not being done for the patient if shock treatment is not being tried.

(6) In my opinion a start should be made in every hospital where shock treatment is used to build up "a science of shock treatment" by appointing a man with sufficient time and talent to study the whole relationship between patients and the treatment as to the suitability, the reaction, the volume, the length of time, and the post-treatment results which may follow for at least twelve months after a course has been given.

—I am, etc.,

London, W.1.

JOSIAH OLDFIELD.

SIR.—I am afraid I cannot see eye to eye with Dr. D. W. Winnicott's plea for a discussion of the ethical implications of the shock treatment in psychiatry (Dec. 25, p. 829), as it seems to me that there does not exist such a problem if the treatment is administered—as it always ought to be—by the experienced mental specialist only. Any practitioner experienced in the treatment and the psychopathology of mental disorders appreciates the drawbacks of this method, and knows that one cannot cure schizophrenia or even involutional melancholia by merely turning a switch or injecting a chemical compound into the veins. He knows that this is only part of a treatment which must be supported by purely psychological methods such as persuasion, psycho-analysis, and suggestion. He is horrified at the thought that anybody but an experienced mental specialist may feel entitled to try out this method of treatment, which is just as dangerous in the hands of the inexperienced as radium or an anaesthetic in untrained hands.

Although some patients are frightened or feel some vague discomfort during the treatment, no patient is conscious of being hurt by it, and there is not the least suggestion of a suicidal impulse on his part. Neither have any of my colleagues, who have administered hundreds of shock treatments, ever been aware of intending consciously or subconsciously to hurt the patient, and I am convinced that even the most thorough psycho-analysis of all mental specialists administering this treatment would fail to detect any sadistic complexes.

As I have pointed out in a previous letter (Oct. 24, 1942, p. 496), the indications for shock treatment are limited, and the aim of the treatment—cure or relief only—must be kept in mind when selecting the cases. It is surely no panacea and dangerous in the hands of the inexperienced. The conscientious expert, however, need have no troubled conscience as to the ethical justification so long as he keeps in mind that the essence of all mental treatment is psychological. The tremendous success of the electrical convulsion apparatus even in the lay press is undoubtedly due to the old magic of electricity, with its switchboards, wires, and red lights, which acts even in these enlightened times like a potent psychological factor or even with greater charm and power than the injection in a vein and the manipulations of nurses and physician during shock treatment.—I am, etc.,

K. A. GRAF,

Assistant Medical Officer, Monmouthshire Mental Hospital.

### Duodenitis

SIR.—Dr. Wroth's letter of Nov. 27 about duodenitis raises several points of great interest to radiologists.

He asks for a definition of duodenitis. Surely, duodenitis means inflammation of the duodenum, chiefly of the mucosal coat. The inflammatory changes in the mucosa are described by pathologists who have studied suitably prepared specimens.

The indirect signs of such changes are unreliable, and the radiologist should apply himself to the demonstration of the condition of the mucous membrane of the duodenum. He may report that his interpretation of the appearances is that the mucosa is normal, that there is an ulcer niche or

other abnormality present, or that the rugae are coarsened in calibre, irregular in pattern, and stiffened in consistency. Until the latter appearances can be shown to be due to some other condition they must be considered as due to inflammatory changes—i.e., duodenitis.

The fluoroscopic examination permits the study of the movements of a given part, but with modern technique a report on the anatomical conditions is not to be permitted. What is seen on the screen can be and must be recorded on the film. If it is not, the radiologist may, without shame, report that for one technical reason or another he has failed to demonstrate the condition of the mucosa. He must not mislead the clinician by casting a radiological horoscope and interpreting indirect signs as indicating an organic lesion. Rapid emptying of the stomach, spasm of the pyloric antrum, irregular and fleeting filling and inconstant contour of the duodenal cap, are signs of a disturbance of gastro-duodenal motility: they may mask an organic lesion. If the observer cannot find the latter, he is not entitled to infer its presence from the former. This is not the time or place to enter into the differential diagnosis or into technique in any greater detail. Duodenitis, as gastritis, seems to be a definite and defined condition. The frequent diagnosis of such a condition on insufficient evidence brings radiological methods into disrepute.

—I am, etc.,

London, W.1.

G. T. CALTHROP.

SIR.—I am in agreement with Dr. Norman Henderson's remarks (Dec. 25, p. 828) concerning cases in which the outstanding features are spasm of the pylorus and duodenum. I have found that the great bulk of these cases are due to duodenal ulcer. I have no doubt that there is such a condition as "duodenitis," and typical features of this condition with pathological verification have been described by Dr. B. R. Kirklin. I myself have never actually met with one of these cases, but I should imagine that they are similar to the cases of chronic duodenitis mentioned by Dr. Henderson.

There is one point upon which I should like to comment, and that is in relation to the ulcer crater. Dr. Henderson says that only a small percentage of duodenal ulcers present a demonstrable crater on x-ray examination, and that the large proportion of those showing craters have a history of long standing. This statement of his, perhaps, needs some modification. Akerlund in his series of cases found a crater in 60% and Berg in 50%. Geyman in America found it in 40% in his first series, and in a later series 60% of all cases. In an investigation of cases at Manchester Royal Infirmary I found it in 42% of all cases diagnosed as duodenal ulcer. These figures are rather higher than a "small percentage." Apart from this, in 117 cases showing a crater 11 had no deformity of the cap or irritability and 37 showed only a slight degree of deformity. In fact, a crater was shown in 48 out of 90 cases having slight or no deformity (i.e., 53%), and in only 12 out of 47 cases with severe deformity (i.e., 25%). This shows that the crater is more often found in earlier cases than in those with a long history, as these 90 cases all had histories under five years. Certainly, no radiologist would wait until he found a crater before diagnosing a duodenal ulcer; but it is, when found, a very valuable sign, more so in early cases, and may be the only sign of an ulcer. It is therefore in early cases that it should be particularly searched for.—I am, etc.,

Wrexham.

STANLEY NOWELL.

### X Rays and the Clinical Society of London

SIR.—In reply to Sir Arthur Hurst's letter (Dec. 18, p. 795), my authority for the statement that the most interesting event in the history of the Clinical Society of London was the first medical description of x rays in this country was Sir William Hale-White, who was honorary secretary of the Society in 1893-6, and in a letter to the *Lancet* (1930, 2) said that "we owe to Prof. Thompson the first medical demonstration of x rays in this country." My attention had been drawn to this letter by a note in Lady Burdon Sanderson's memoir of her husband (1911, p. 73), who, besides many other distinctions, was the first honorary secretary of the Clinical Society.—I am, etc.,

Kensington, W.8.

J. D. ROLLESTON.



## Obituary

GEORGE CRANSTON ANDERSON, C.B.E.,  
M.D., LL.D., F.R.C.P.

Secretary, British Medical Association

We announce with sorrow that George Anderson, our dear friend and honoured colleague, has died in hospital ten weeks after the severe heart attack which overtook him on Oct. 23.

From the time it was founded by Sir Charles Hastings (who was its first General Secretary as well as its first Chairman of Council) the British Medical Association has been fortunate above all things in its leaders. This remark applies not only to the long list of men who have occupied its principal chairs or sat at its treasury but to the shorter succession of its chiefs of staff. No three men could have been more diverse in gifts, outlook, and temperament than the three who have borne the title of "Medical Secretary"—Sir James Smith Whitaker, Dr. Alfred Cox, and Dr. G. C. Anderson—yet each of them during his term of office and in the situation which he had to face came to be accepted as the embodiment of the B.M.A. In each case the name of the Association and of its chief executive official were for the time being interchangeable terms.



(Elliott and Fry)

When Alfred Cox retired from the Medical Secretaryship in 1932 there were many who felt that, efficient and popular as his successor would assuredly be, he could never fill the place occupied by Cox. The man who had been Cox's trusted deputy for thirteen years certainly presented a complete contrast in appearance and manner to his old colleague. But he found his way into the confidence and affection of the rank and file as assuredly as did his predecessor. The good B.M.A. executive officer is not fashioned from a single mould.

The career of George Cranston Anderson was so closely bound up with the Association from the time of joining its headquarters staff when he was not yet forty that one was inclined to forget that he had already ten years in general practice, followed by three years on active war service in Egypt.

Palestine. He was born on Nov. 14, 1879, the only son of a Scottish minister, the Rev. K. C. Anderson, D.D. The father was a native of Jedburgh, who early in life held several pastorates of Congregational churches in the United States, and came back to this country to the charge of a church at Bradford, and eventually to one at Dundee. He was one of the leaders in the liberal theology controversy of forty years ago. Cranston was the family name of his mother. The son went to Edinburgh University, where he was famous as an athlete, took his M.B., Ch.B. in 1904, and proceeded M.D. in 1909. For several years he won the university championship over the hurdles, the long jump, and the high jump; he was also for a year Scottish amateur champion hurdler. After a period as house-surgeon at Clayton Hospital, Wakefield, he returned North and settled in practice at Methil, a coast village in Fife, in 1906. He served also as medical superintendent of the Wemyss Memorial Hospital near by.

Always a most likeable man, with charm and grace of manner, he soon became known and esteemed among his colleagues in the Fife Branch, which from its formation was an active and influential unit in B.M.A. affairs, especially during the troubles which accompanied the inception of National Health Insurance. About 1911 Anderson became honorary secretary of the Branch and a member of the Scottish Committee. He was secretary also of the Panel Committee, and, when the first European war broke out, of the Local Medical War Committee.

The war, however, presently took him away from the coast of the Firth of Forth to the banks of the Nile, where he served as surgical specialist to the 69th General Hospital. Soon after his return in 1919 he was called to the Deputy Medical Secretaryship of the Association. His colleagues in Fife mingled their regret at the severance with their pride in the fact that "Anderson of Denbeath" should have been given this opportunity of helping to shape medical policy in the post-war world. They gave him a presentation of silver plate and expressed their affection for him and their respect for his qualities.

At the time George Anderson entered on his work at the former London home of the Association, 429, Strand, the war machine was, going into reverse. The work of the Central Medical War Committee, which had absorbed so much of the energy of headquarters for four strenuous years, was now directed in the main to help in individual cases of hardship on demobilization. The rumblings of the National Health Insurance controversy, silenced during the war, began to be heard again, though the note was different. The Insurance Acts Committee under the brilliant leadership of Dr. (afterwards Sir Henry) Brackenbury was engaged on the formidable task of consolidating the new service so that it yielded the greatest public good, and of endeavouring so to improve the terms and conditions as to yield as much satisfaction as possible to practitioners. The secretaryship of the committee fell to Anderson's lot; it called for an immense amount of complex administrative work, and it was said of him that he knew the Insurance Acts and Regulations from end to end. Those were days when the Panel Conference met generally twice in the year and sat until midnight. Negotiations over terms of service were opened up with the most intractable of Ministers of Health, Sir Alfred Mond, afterwards Lord Melchett. Anderson did great service in preparing the Association's case at the first court of inquiry into the capitation fee, presided over by Sir Thomas Hughes, and the evidence for the subsequent Royal Commission. Even after he had become full Medical Secretary he retained his post at the right hand of the chairman of the Insurance Acts Committee, not, as he explained, because he lacked faith in his juniors, but because he felt that in a period which continued to be difficult it was an advantage to have someone who had had experience of previous negotiations. He was also identified with the work of the Science, the Ethical, and the Hospitals Committees, and took a share in formulating the hospital policy, a tedious but necessary piece of business undertaken in the early 'twenties.

Two excellent pieces of organization which lay outside the main stream of the Association's work and which owed a great deal to Anderson's enthusiasm and statesmanship were the National Eye Service and the National Register of Medical Auxiliaries. His secretaryship of the Ophthalmic Committee led on to an active share in the National Ophthalmic Treatment Board, which organized the National Eye Service in 1929. The National Register was established, after difficult negotiations, in 1933; he was a member of the Board of Registration, and took immense pains over a very delicate piece of work. Never did he lose in the grind of routine the zest for new achievement. He entered with vigour into the fight which the Association undertook in the Select Committee of the House of Lords against the proposal to register osteopaths. At every sitting of that committee there he was, conferring with the distinguished counsel who appeared for the Association, and marshalling the medical evidence. But in fact the later career of Anderson is the history of the Association. In deputations to Ministers, in innumerable conferences, in round-table discussions with representatives of other medical bodies, of hospitals, of trade unions, as well as in the routine business of the Council and its committees—committees which seldom sat for less than three hours—he was always the chairman's aide-de-camp, the spokesman's prompter, the man who attended to things, and when himself called upon to speak, always modestly firm and persuasive, and generally getting his way.

It was in 1932, following the Centenary celebrations, that he succeeded Dr. Cox as Medical Secretary. He had long been marked out for that promotion. Five years later, after reorganization at the head office, he became Secretary, the prefix "Medical" being dropped. This only meant that to his former duties and responsibilities were added many others on the business side. It must be remembered that in addition to

its more ordinary activities the Association is a considerable landlord and a large employer of labour.

In 1935 came the memorable meeting at Melbourne and the World Tour. The genius of Anderson for creating a spirit of good fellowship contributed to the success of the occasion, and after the voyage a number of members of the party publicly acknowledged his "untiring courtesy and helpfulness." A more serious and exhausting mission awaited him in the winter of 1936-7, when he was sent to India in order that the Council might have first-hand information of the conditions of practice there. In less than three months he travelled over 10,000 miles on the Indian railways, visited 19 cities in 11 provinces, saw something of the principal medical colleges and a number of the schools, and obtained an insight into all forms of Indian medical practice. The members of the profession in India were greatly stimulated by the addresses he gave. One of his hosts in the Punjab said that before he came a very general remark among the members was, "The B.M.A. has done nothing for us," but after he had gone the remark was altered to, "We are the B.M.A." George Anderson was certainly the most travelled official the Association has ever had. In addition to visiting various cities on the Continent as the representative for Britain on the Association Professionnelle Internationale des Médecins, another long tour was undertaken early in 1939, when he visited the West Indies. The purpose of this journey was partly to enable him to recuperate after a protracted illness and partly to encourage the West Indian Branches. He visited Barbados, Trinidad, Grenada, and Jamaica, and was warmly welcomed by gatherings of members in each place.

The outbreak of the second European war brought to him a period of strain comparable only with that experienced by members of the Government and the heads of the Civil Service and the fighting Services. In the recruitment of doctors for the Forces, in holding the balance between civilian and military requirements, in endeavouring to redistribute doctor-power so as to meet the situation brought about by evacuation and large transfers of labour, his energy, tact, and wisdom were constantly at call. The Emergency Medical Service, the Protection of Practices Scheme, and various other pieces of organization, hurriedly called into being, required daily attention and looking ahead. He was the natural target for multitudes of questions, down to such matters as the allowance of petrol for a doctor's car or the calling up of a doctor's maid-servant, and often a case which related only to one individual would necessitate a long correspondence and perhaps interviews. All this had to be done with a staff depleted of many experienced workers and recruited from the inexperienced.

Even while this wartime burden was being carried, and was actually expanding, there came the need to plan for the post-war period. The Medical Planning Commission was set up and issued its interim report. Then came the Beveridge report and the invitation from the Minister of Health to form a Representative Committee for conversations on the shape of future medical services. The implications of that invitation were instantly grasped and acted upon by Anderson. His statesmanship was again shown in the lead he gave, particularly in addresses in Manchester, Edinburgh, and Glasgow in the summer of 1943, entitled "Evolution, not Revolution," which steadied the position and influenced the discussions in the Association on the principles of the future service in anticipation of the Government's White Paper. But these multiplied labours, with an eager spirit which would permit no slackening and a physical frame which in recent years was far from robust, contributed to the serious breakdown in health which followed the Annual Representative Meeting of 1943.

To the good secretary no detail of his work is trivial. Anderson never became so absorbed in central concerns as to neglect the periphery. In normal times he took his full share of visits to Divisions, often involving long travelling, perhaps by night, to address the faithful few who turned up, unless, of course, some crisis brought an overflowing attendance. But his not over-prepared addresses, like his "Occasional Letters," carried an influence out of proportion to their rather incidental character. With the honorary secretaries of Divisions and Branches he cultivated a fraternal attitude. He knew their difficulties, having been an honorary secretary himself. He once expressed his dislike of letters which began, "I am sorry to trouble you": he was there, he said, to be troubled. To

those who served under him at headquarters he was a considerate chief, always ready to make public acknowledgment of the good work of his juniors, and to give any buried talent an opportunity for emergence. But he possessed also a sense of humour and something of a philosophic detachment, and it was refreshing to catch the twinkle in his eye when a committee—or some members of it—was taking itself too seriously. Not that he ever lost dignity; an easy dignity came naturally to him, and a fine and agreeable presence marked him out in any assembly.

Of the Association and its ideals he was a zealous champion. Any attack upon it in the Press or elsewhere, or any misconstruction of its action, drew from him a reply which was all the more cogent for being so courteously expressed. He often lamented that, somehow, the good work that the Association was doing remained unknown to the mass of Association members and to the public.

In 1935 he was awarded the King's Jubilee Medal. At the Belfast Meeting in 1937 the Hon. LL.D. of Queen's University was conferred upon him. In the speech at the graduation ceremony he was described as one who had "brought to the consideration of the questions which concerned the Association an alert and balanced mind, in sympathy with the difficulties of the general practitioner, but determined also to see that medicine was so organized as to function with the greatest possible efficiency in advancing and maintaining the health of the community."

In 1941 he was elected a Fellow of the Royal College of Physicians of London under the special by-law, and in January, 1942, he received the Commandership of the Order of the British Empire. His home life was ideally happy, and with Mrs. Anderson, who accompanied her husband on many Association occasions, including his long tours on Association business, the deepest sympathy will be felt among a wide circle of friends in the profession and far beyond it.

#### Personal Tributes

Sir KAYE LE FLEMING writes:

The news of the death of the Secretary will come as a shock and arouse a sense of grievous loss and concern in the minds of all members of the Association and, indeed, of most members of our profession. Few outside the Council were aware of the grave anxiety felt for his health since his sudden breakdown in October. Only those with inside knowledge of the organization at B.M.A. House can appreciate the great strain borne by the Secretary, especially during the last few years, and his determination not to spare himself in the effort and responsibility which his post involved. No one could persuade him to take the break from work necessary to meet the strain on his health, and his manner and appearance helped to disguise the heavy calls he was making on his strength. It may truly be said that George Anderson gave his life to the Association and his profession.

Anderson came to the B.M.A. just after the last war, at a time when the Association was suffering from the setback of the introduction of the National Health Service followed by four years of war. He succeeded Dr. Alfred Cox in 1932, and lived to see the membership of the Association more than doubled, a steady increase of more than one thousand members for each year of his connexion with headquarters. His trip to Canada in 1930, his management of the "Round the World Tour" in 1935, his special visit to the West Indies, and to India in 1937 made him a familiar figure to the leading members of our profession throughout the British Empire and in America. Everywhere he carried with him the capacity of associating his organizing professional duties with the personal charm which endeared him to all he met. Surely no other member of our profession could ever count such a host of friends and admirers. The full share of the increased influence and prestige of the Association which we owe to him will take time to appraise and appear in proper perspective, but his name will be indelibly inscribed in our history.

It is not easy to pay tribute to the many qualities that helped to make Anderson the outstandingly successful man he was. The alert upright figure, the easy conversational gifts and charm of manner attracted at once. His power of rapid concentration on successive diverse problems, combined with an

inexhaustible capacity for work, astonished even those who continually shared his labours. Easy of approach, he had the great gift at his command of mixing with all men. In delicate negotiations with Government Departments, however difficult, he never made an enemy. In public speaking clear and to the point, delivered with sincerity and dignity and with just the right touch of humour when required, he always pleased his audience. Those who were closest to him in his work would perhaps place highest in the list of his gifts the sure perception of principles of policy and his foresight in preparing for future changes which appeared to him inevitable.

Much more could be said, and will be said, ere justice is done to so fine an example of our profession. Anderson is gone, and at the very moment that we need him most. The B.M.A., the profession, and the public are the poorer by his loss. Our great organization has received a shock which for the moment leaves it stunned. Without him our resources to meet the crisis that lies ahead will be severely taxed, but we shall never forget the hand that has guided us so far with success.

To Mrs. Anderson will go a wave of sincere sympathy, and from all those members in particular who remember the graceful part she played in the big social events of our Annual Meetings.

Dr. H. GUY DAIN, Chairman of Council, writes:

To those who have known him since his appointment to the Association, the B.M.A. without George Anderson does not seem possible. No association ever had a more single-minded servant. The B.M.A. may be said to have been both his work and his hobby. Its interests were never out of his thoughts, and he was always planning for its advancement. And with what success its growth during his Secretaryship, with the increasing influence of the Association, both in the social life of the country as well as among doctors, is eloquent testimony. He really did live for the B.M.A. His boundless energy was always at the service of the Association. As Secretary to the Insurance Acts Committee, in earlier years, and all through his office, his work to improve the insurance medical service and the conditions of insurance practitioners has been continuous, and is fully recognized by all. An outstanding example of his foresight and statesmanship is the present Central Medical War Committee. While war was yet an uncertain threat, he was responsible for setting up a card index of all registered practitioners with their qualifications, experience, and ability to undertake war work. This index was completed and ready for immediate use for the recruitment of doctors as soon as war broke out, and has been of inestimable value to the country as well as to doctors.

And of Anderson the man. Those of us who have known and worked closely with him for so long, are mourning a dear friend. One to whom we could always take our problems, and certain of a good-tempered and sympathetic reception, and help in the solution. One of the attractions of attending a meeting in London was the opportunity of a talk with George before and after the meeting. His cheerful friendliness and welcoming smile will always remain. And outside the B.M.A. he did enjoy his golf and his game of bridge.

His memory will live on. The Association will reap the reward of his labours in the years to come. In future days, as the results of his work are incorporated in the machinery of the medical profession, there will be many doctors who with grateful hearts will want to say, "Thank you, Anderson." The whole Association mourns with Mrs. Anderson.

Mr. H. S. SOUTTAR writes:

Only those who have worked closely with Anderson in the last few years can realize what the British Medical Association and the whole country have lost. He had become so essential a part of every phase of our professional organization that it is difficult to think of it apart from his inspiring personality. For years he has been our ambassador at the Ministry of Health, and few decisions were reached without his advice. The Planning Commission was his own idea, and to him we owe the co-ordination of our whole profession which has resulted largely from its work. The Medical War Relief Fund was established at his suggestion. But his great achievement has

been the organization of recruitment of our profession for war, of the whole of which he was the very pivot and mainspring. On the Priority Committee, the Central Medical War Committee, the Services Committee, and on all the ramifications of the intricate problems involved, he worked with untiring energy, with no thought of the cost to himself.

In the arduous days which lie ahead we shall sadly miss his wisdom and his enterprise, but those who follow him will reap the reward of his great labours. Beyond any question he has sacrificed his life in the service of his country, but not before he had laid the foundation of great future progress. He has set before us great ideals, and to follow them is the highest tribute we can raise to his memory.

Dr. MONTAGUE SYDNEY WOOLF, who died in America on April 20 last, was born in Plymouth and received his early education in Birmingham, after which he spent a year at Bonn and Heidelberg with a scholarship in modern languages. But his true calling was medicine, which he studied at University College Hospital, London, winning a scholarship in anatomy and physiology and medals in pathology and clinical surgery. He qualified M.R.C.S., L.R.C.P. in 1914, and during the last war served with the R.A.M.C. and in the British Naval Transport Service. After the close of the war Dr. Woolf settled in San Francisco, where he became resident surgeon at the University of California Hospital. In 1925 he visited London for postgraduate study in proctology. His publications were largely on matters connected with that specialty, but he also wrote a textbook *Principles of Surgery for Nurses*. In an obituary notice appearing in *California and Western Medicine* Dr. Richard W. Harvey has paid tribute to Dr. Woolf's gentleness, devotion, and friendliness.

We regret to announce the death on Dec. 23, 1943, at Haslemere, Surrey, of Mr. ARTHUR HENRY WILLIAM HUNT in his 78th year. He studied medicine at the Westminster Hospital, where he won a scholarship, and took the L.R.C.P. diploma in 1888 and the M.R.C.S. in 1889. After serving as house-surgeon at the Westminster he began his long connexion with the Royal Hospital, Wolverhampton, as house-surgeon, later becoming honorary gynaecologist and a member of the visiting surgical staff. On his retirement the governors of the hospital elected him consulting surgeon. He held a commission as captain R.A.M.C.(T.) during the last war, and was awarded the M.B.E. in 1920. In 1925 Mr. Hunt gave up active work and went to live in Surrey. He had joined the British Medical Association in 1893 and was chairman of the Guildford Division 1931-2. In recognition of his work for the profession during many years of practice in the Midlands the Birmingham Branch elected him an Associate Member.

Dr. JOHN HARVEY KELLOGG, who died last month at Battle Creek, Michigan, towards the close of his 92nd year, combined a number of diverse qualities which made him almost a legendary figure. First and foremost he was a health reformer, with ideas much in advance of his time; he was beyond question a philanthropist; he had keen business sense and ability, coupled with a gift for showmanship; and his dominant personality and unflagging zest for life were part and parcel of the wonderful physique which bore him along into advanced old age with his faculties in full working trim. In matters of regimen Dr. Kellogg practised what he preached for 70 years; he was a walking testimonial to the rules of health which he had laid down for the inmates of the Battle Creek Sanitarium and which he spread far and wide through his magazine *Good Health*. Almost up to the end he was hard at work, with his chief dietitian, on a *Vitamin Cook Book*, bringing his ideas on nutrition and dietetics into line with modern knowledge. On his 90th birthday (Feb. 26, 1942) he received messages of congratulation from people of the highest standing in the U.S.A., and the citizens of Battle Creek gave him a framed address and a banquet in honour of "one who loved his fellow men." Dr. Kellogg graduated M.D. from the Bellevue Hospital Medical College, New York, in 1875, and his lifelong work in and for the sanitarium began as a temporary one-year job. Later he launched the cereal food business which made his name a household word. People from many other countries went to his institution for a complete physical overhaul; others spent their holidays at Battle Creek as out-patients, following a prescribed course of diet and exercise and attending the clinic for practical guidance. In his younger days he often toured Europe, visiting medical centres in Rome, Vienna, Paris, London, Berlin, and Petrograd, picking up ideas to put into practice at Battle Creek.

## The Services

The D.S.O. has been awarded to Major (temp. Lieut.-Col.) P. R. Wheatley, R.A.M.C., and the M.C. to Capt. (temp. Major) J. B. McEwen and Capts. G. Rieby-Jones and J. Rutherford, R.A.M.C., in recognition of gallant and distinguished services in Sicily.

Surg. Lieut.-Cmdr. R. G. Reid and Acting Surg. Cmdr. E. G. Thomas, R.N.V.R., have been awarded the R.N.V.R. officers' decoration.

The following appointments and mentions in recognition of distinguished services in Persia and Iraq have been announced in the *London Gazette*:

C.B.E. (Military Division)—Major-Gen (temp) J G Gill.  
D.S.O., O.B.E., M.C., late R.A.M.C.

O.B.E. (Military Division)—Col. (temp) W. H. A. D. Sutton,  
R.A.M.C.

M.B.E. (Military District).—Capt. (temp Major) M S Boparai.  
I.M.S.

*Mentioned in Dispatches*—Major (temp. Lieut.-Col.) W. A. D. Drummond, Major D. J. O'Ryan, Capt. T. Ronai, R.A.M.C., Col. (temp.) K. S. Master, M.C., Capts. (temp. Majors) J. H. Bowie, and J. S. Gill, and Subadar G. Durair Krishnan, I.M.S.

The London Gazette announces the appointment to M.B.E. (Military Division) of Fl. Lieut. S. T. Winter, R.A.F.V.R. The announcement reads as follows:

When rescue for an operational sortie on 14 July 1943, a Stirling bomber crashed while attempting an emergency landing. The bomber burst into flames. Fl. Lieut. Winter, who was the medical officer on duty immediately proceeded to the scene. Regardless of his own safety, he immediately strove to escape and entered the burning fuselage in a vain endeavour to release the mid-upper gunner, who was trapped upside down in his turret. Despite the flames and heat, Fl. Lieut. Winter then attended to the needs of the injured members of the crew. Throughout he displayed high courage and devotion to duty.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Temp. Surg. Lieut. G. D. Taylor, R.N.V.R., for services to the injured after an explosion at sea.

## CASUALTIES IN THE MEDICAL SERVICES

*Died in East Africa.*—Capt. J. B. C. Murdoch, R.A.M.C.

Killed.—Lieut. V. L. Cooper, R.A.M.C.

*Killed in action.*—War Subs. Capt. J. E. T. Munn, R.A.M.C.

**Wounded.**—War Subs. Capt. D. J. Fraser, L. C. Montgomery, M. I. Robinson, and B. C. Rowlands, and Major J. D. Sprague, R.A.M.C.

## DEATHS IN THE SERVICES

We regret to learn that Lieut.-Col. DONALD UYEDALE OWEN, M.D., R.A.M.C., has died in Africa as the result of an illness contracted while on active service. He was honorary physician to out-patients at the Liverpool Royal Infirmary and held various other clinical appointments after winning many academic honours. S. B. H. writes: Donald Owen was in the tradition of, and succession to, a long and of medical men of Welsh extraction who have enriched the profession on Merseyside during the past three decades. Their enduring qualities of strong humanity and kindness of nature, combined with medical skill, were possessed to the full by Donald Owen, and his passing after a relatively short but busy and successful career as a physician will leave a sense of personal loss with his very many friends. As a friend since student days, may I pay tribute to one whose influence and example I, with many more of his friends and colleagues, will carry with me as a lasting memorial.

## Universities and Colleges

## UNIVERSITY OF CAMBRIDGE

At a Congregation held on Dec. 11 the degrees of M.B., B.Chir. were conferred by proxy upon J. R. Handforth.

The following candidates have been approved at the examinations indicated:

**FINAL M.B.—Part I (Surgery, Midwifery, and Gynaecology):** M. S. Adams, C. Attenborough, H. H. E. Batten, T. S. L. Bewick, P. Blaxter, A. Brazier, D. W. Burnford, J. L. Brown, J. L. Cart, R. Clouai, A. C. Compton, N. C. Cooper, P. D. B. Davies, C. D. Drew, E. C. Dyson, R. D. England, D. A. W. Edwards, F. H. Epstein, D. M. Evans, J. J. Fleminiger, M. A. Floyer, P. W. Friedlander, J. W. Fullerton, S. A. M. Harclan, H. M. Giles, M. T. Gillies, M. L. Graeme, C. R. H. Green, J. A. Hartington, C. E. Hartley, G. Hartnidge, F. N. Hicks, I. S. Houghton, B. Holmes, N. S. Hooper, G. J. C. Inman, C. Irving, D. James, C. K. Keane, A. L. McKelvie, R. M. MacPhail, I. A. Magness, M. Lytle, B. Mellroy, T. D. Mort, M. W. L. Mutch, K. N. V. Palmer, T. J. S. Patterson, C. R. Payne, P. B. Philip-Smith, P. D. G. Pugh, K. E. E. Read, T. J. Rendle-Shoof, J. Roche, L. J. Rowley, R. Roxburgh, J. St. John, D. Schofield, D. Schofield, J. A. Shiers, F. N. Siddlebottom, J. Symonds, J. W. E. Tillet, J. C. H. M. Tilden, R. G. Turner, D. Vanstone, D. G. Veater, N. T. Welford, D. P. Whearely, P. Winberg, R. A. Womersley, K. A. A. Wray, G. S. Yeoh,—K. A. C.

Dowen, P. J. Croop, M. Farquharson, R. C. A. Hunter, E. M. Kingsley-Pillars.  
S. M. Martin, L. Predigerast, K. M. E. Reaney, H. F. Seab-Monsterey.  
M. M. Tunstall-Behrens, B. J. Smith.

*Part II (Principles and Practice of Physics, Pathology, and Pharmacology):*  
D. Amble, F. Ashio, V. L. Bullington, A. J. Briggs, L. L. Bromberg,  
C. Carpenter, K. Chnuv, F. A. L. de Cunha, M. P. Durham, J. W. Evans,  
J. Fisher, W. Foreman, J. A. Hallinan, M. Hemming, R. F.  
Hobson, M. D. King, W. Knowles, J. B. Lyon, D. A. Mitchell, R. G. F.  
Parker, M. B. Paul, W. R. Probert, T. Rendle-Short, B. W. Rhodes, L. J.  
Rowley, I. A. Roxburgh, F. A. R. St. John, A. N. Smith, D. Soltau,  
P. G. Somerville, R. G. Tasker, J. H. M. Tilley.—M. K. E. Reaney.

## UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN MEDICAL RADIOLOGY.—Olga Bauerova, Phyllis Burville-Holmes, Elspeth M. Ledlie, M. G. Magan.

## UNIVERSITY OF BRISTOL

The following candidates have been approved at the examinations indicated:

CU M—Marjorie O Dunster  
Final M.B. CU B—(Mrs.) Rukmini L. Ashley, Janet Baker, C. K. Bridge  
Margaret P. Drew, J. Eskell, E. C. Hamlyn, Beryl M. Hinckley, P. A.  
James R. Maggs, (Mrs.) Margaret Pardoe, (Mrs.) Marjorie J. Williams. In  
Group I (completing examination) Elizabeth N. R. Wilson.  
Distinction in Public Health.

## UNIVERSITY OF SHEFFIELD

The following candidates have been approved at the examination indicated:

Final M.B., Ch.B.—*Parts II and III*: R. H. Canter, B. S. Crawford & Ellison, H. Hardy, Margaret S. Hunt, L. A. Storer, Helen M. H. Twidle

QUEEN'S UNIVERSITY, BELFAST

The following candidates have been approved at the examinations indicated:

M-D J. W. Mylitta (with gold medal), T. G. Milken,  
M.B., B.Ch., B.A.O., J. Dando Corkin, J. E. Macdon, J. H. Johnston  
K. G. Malcomson, Margaret Mitchell, J. H. Mick, Pinkerton, H. M.  
Evenson, A. P. S. Ainley, W. J. Allen, M. W. J. Boyd, M. Brown, W. L.  
Lawrence, J. F. J. Campbell, R. D. G. Cowden, R. D. G. Creery, Esther N.  
Davis, W. S. Davis, J. Donaghy, R. J. Donaldson, J. Ferguson, S. I. Gibson  
M. Glass, F. G. Groot, D. G. F. Hamilton, F. Jackson, J. Jefferson  
Gordon, K. Ray, R. S. McLean, G. G. McDowell, C. McGinnis, A. I.  
Mathewson, T. F. B. Minford, J. Mitchell, T. M. Routfen, N. Sanderson  
Smith, Marion G. Summ, C. M. Taggart, Adeline H. Thompson, I. G.  
Atchman, Margaret R. Wilson.

SOCIETY OF APOTHECARIES OF LONDON

At a recent meeting of the Court of Assistants, with Sir Stanley Woodward, Master, in the chair, Surg. Rear-Admiral C. P. G. Wakeley was elected to a seat on the Court, and Mr. Ernest Busby was appointed Clerk to the Society.

The following candidates have satisfied the examiners in the subjects indicated:

PATHOLOGY, BACTERIOLOGY, AND FORENSIC MEDICINE—P. L. Bransvig, J. L. Brennan, D. E. M. Brown, N. J. Caldwell, D. Cappon, K. R. J. Coster, V. G. Dawson, E. L. Dutt, R. J. H. Hodges, F. R. S. Knight, P. E. Kars, D. A. Tait, E. G. Wright, S. Yaffe.

SURGICAL—A. W. Banks, A. E. Bernstein, J. L. Brennan, D. E. M. Brown, G. Martin, J. Middleton, D. A. Tait, A. G. Wolstenholme.

MEDICINE—A. W. Banks, D. E. M. Brown, P. V. G. Dawson, R. K. Asham, F. R. S. Knight, E. Mars, C. P. P. Nair, D. A. Tait, E. G. Wright, J. Middleton, A. L. S. Brown, D. Cappon, P. V. G. Dawson.

PHYSIOLOGY—F. Fiducia, J. H. Hodges, M. W. Johnston.

The diploma of the Society was granted to C. M. F. Fiducia and S. Yaffe.

## Medical Notes in Parliament

**Mass Radiology Units for Over-seas.**—Dr. MORGAN asked on Dec. 14 whether any steps had been taken to secure durable, transportable mass radiology sets and trained personnel for use in the various Colonies. Col. STANLEY replied that the supply position was such that at the present time it was not possible to arrange for a satisfactory type of mobile unit for use in tropical conditions to be built in this country. The position was kept under review.

**Immunization against Tuberculosis.**—Dr. SUMMERSKILL inquired Dec. 16 what action the Minister of Health was taking following request from the Tuberculosis Association that recognition should be given to the importance of immunization against tuberculosis. Mr. WILLING said he knew the Tuberculosis Association had been drawing attention to this subject. Immunization against tuberculosis is still surrounded by numerous difficulties, but he was arranging his officers to discuss the whole matter with representatives of the association.

**Treatment of Arthritis.**—Mr. WILLINK told Major Lyons on April 16 that the cause and treatment of arthritis continued to receive the active attention of the Empire Rheumatism Council, whose last report was published in December, 1942. Research into causation of arthritis was restricted by the lack of any promising fresh line of approach. New methods of treatment were tried as they became available. Life insurance was not available to patients, and the cause of the disease was not as yet known. The only treatment being made in the United States was the use of the efficacy of electrically activated ergosterol. He was making inquiries as to the position in the United States.

**Silicosis Claims.**—Mr. HERBERT MORRISON said on Dec. 17 that since July 1 the medical board had received 2,213 applications from South Wales coal-miners under the Various Industries (Silicosis) Scheme, 1931, or the Coal-mining Industry (Pneumoconiosis) Scheme, 1943. In 1,282 of these cases the board had not yet come to a decision. As from July 1 last the strength of the medical board in South Wales was doubled, and further assistance was being given so far as was practicable. Claims on the medical profession at the present time made it very difficult to secure the services of qualified men who could devote time to this work, and some delay was unavoidable.

#### Notes in Brief

Thirty-two British prisoners of war recently repatriated from Germany were classified as suffering from mental and nervous affections justifying repatriation. The number of prisoners of war in Germany classified as suffering from mental ailments was small.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* there was a large fall in notifications during the week: scarlet fever down by 628, acute pneumonia by 363, whooping-cough by 241, diphtheria by 84, dysentery by 33, and measles by 28.

Influenza deaths in the great towns numbered 1,109, or 39 fewer than in the preceding week. (Returns for the week ending Dec. 25 show that influenza deaths are down to 690.) The largest number of deaths registered during the past five weeks were in London 366, Birmingham 211, Manchester 207, and Liverpool 137. Liverpool was the only one of these cities for which an increase was recorded during the week ending Dec. 18.

During recent weeks scarlet fever, whooping-cough, and measles have been steadily declining in incidence; measles is at its lowest level since registration began in 1939. The drop in acute pneumonia was greatest in the North, the largest falls being in Yorks West Riding by 117, and in Lancashire by 70.

The chief centres of dysentery were London 47, Essex 13, Lancashire 15.

In *Scotland* similar trends are noticed. The largest falls were 75 for whooping-cough, 77 for scarlet fever, and 47 for diphtheria. Cerebrospinal fever, diphtheria, and scarlet fever were at their lowest incidence since last summer.

In *Northern Ireland* scarlet fever rose by 30, and 67 of the 116 cases were notified in Belfast.

### Diphtheria

The seasonal distribution of diphtheria has been well marked in recent years, with an incidence during the winter of approximately twice that of the summer. The seasonal rise in England and Wales during the present year has not been as distinct, and the decline in the number of notifications during the past five weeks is in contrast to experience of similar periods. It appears that the campaign for immunization has at last begun to have an effect on the incidence of diphtheria. The notifications, summed in five-week periods, compared with the immediately preceding years are:

Weeks	1943	1942	1941	1940	1939	1938	1937
1-5 ..	4,286	4,736	6,057	3,666	6,278	8,726	6,225
6-10 ..	4,121	4,341	5,349	3,409	5,795	7,886	5,782
11-15 ..	3,835	4,083	4,938	3,414	4,381	6,733	4,927
16-20 ..	3,264	3,460	4,500	3,402	3,981	5,170	4,646
21-25 ..	3,043	3,216	4,391	3,568	3,718	4,735	4,774
26-30 ..	2,960	3,515	4,150	3,924	4,350	5,043	4,776
31-35 ..	2,708	3,350	3,639	4,056	3,756	4,745	4,518
36-40 ..	3,610	4,363	4,728	5,315	4,363	5,945	6,638
41-45 ..	3,710	4,620	5,001	6,522	4,782	6,933	8,385
46-50 ..	3,222	4,966	5,459	6,925	4,891	7,562	8,466

The notifications are now only 66% of those for the corresponding period of 1939, the lowest of the recent corresponding periods. The actual position may be more favourable than the returns indicate, since there has been a large increase in the error of diagnosis. This error in the immediate pre-war period was of the order of 30% in London, but lately it has been in the neighbourhood of 50% in the experience of some hospitals, and it is probable, although no figures are available, that this increase is general throughout the country. General practitioners will no doubt feel encouraged by the figures given to back up for all they are worth the campaign so successfully begun by the Ministry of Health.

### The Week Ending December 25

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,786, whooping-cough 1,244, diphtheria 498, measles 363, acute pneumonia 2,079, cerebrospinal fever 53, dysentery 96, paratyphoid 1, typhoid 2. Deaths from influenza in the great towns numbered 690.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	64	5	16	—	3	96	5	26	3	2
Deaths .. ..	2	—	—	—	—	—	—	—	—	—
Diphtheria .. ..	550	4	131	104	43	1,008	36	265	66	30
Deaths .. ..	16	1	3	5	—	27	2	3	3	—
Dysentery .. ..	133	47	47	—	—	113	24	44	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	4	—	1	—	—	1	—	2	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	59	5	4	—	—	69	15	2
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	42	8	11	10	—	51	6	8	24	17
Deaths .. ..	—	—	—	14	—	—	—	—	—	—
Measles .. ..	416	47	59	34	1	13,282	498	569	55	2
Deaths .. ..	1	—	—	—	—	14	2	1	—	—
Ophthalmia neonatorum .. ..	83	3	18	1	1	76	5	12	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	1	—	—	—	—	9	1	2	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	2,593	220	66	21	10	1,003	62	9	6	—
Deaths (from influenza) .. ..	1,109	129	52	3	3	26	—	4	2	—
Pneumonia, primary .. ..	—	—	437	18	—	—	—	232	31	11
Deaths .. ..	—	145	17	15	—	—	—	19	—	—
Polio-encephalitis, acute .. ..	1	1	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	6	1	—	1	—	12	1	1	8	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	2	18	2	—	—	2	7	5	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	132	4	17	—	1	148	12	15	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	1	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,936	145	239	35	116	2,620	176	383	95	—
Deaths .. ..	1	—	1	1	—	5	—	2	—	—
Smallpox .. ..	—	—	—	—	—	—	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	3	—	1	104	—	9	1	1	6	—
Deaths .. ..	—	—	1	—	—	—	—	—	1	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,400	123	158	47	24	1,160	81	60	44	—
Deaths .. ..	13	2	6	—	11	7	—	1	6	—
Deaths (0-1 year) .. ..	406	53	84	60	18	348	49	69	71	—
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	8,502	1,404	830	301	166	4,567	672	615	240	—
Annual death rate (per 1,000 persons living) .. ..	—	—	18.7	19.8	†	—	13.8	16.0	—	—
Live births .. ..	5,825	728	815	316	244	5,901	679	828	322	—
Annual rate per 1,000 persons living .. ..	—	—	16.6	20.8	†	—	17.1	21.5	—	—
Stillbirths .. ..	208	20	38	—	—	213	20	32	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	—	—	—	—	—	—	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth death rates for Northern Ireland are no longer available.



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# Vitamin Therapy and Influenza

## AVOIDING COMPLICATIONS AND SEQUELAE

Febrile illnesses call for reduction in diet. The amounts of light foods which can be tolerated supply a lower calorific intake than is needed. Deficiency in the vitamins is even more important. Requirements increase with the heightened metabolic rate and several of the vitamins cannot be stored.

Many adolescents and adults bear in their teeth the permanent record of vitamin shortage during past febrile illnesses (*Brit. Dent. J.*, 1940, LXIX, 209). Vitamins A and D, calcium and phosphorus should be supplied daily to all febrile patients. Vitamins B and C are equally necessary.

A multiple vitamin and mineral supplement (Complevite) is an essential addition to restricted diets. It should be begun immediately the restriction begins and continued throughout the course of the illness and in convalescence.

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150	VITAMIN B	200	
1350	VITAMIN C	1000	
250	VITAMIN D	300	
0.35	CALCIUM	0.35	
0.002	IRON (available)	0.002	
0.12	PHOSPHORUS	0.55	
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\*The iron in Complevite exceeds the calculated deficiency expressly to combat the nutritional anemia so common in children and in women of child-bearing age.

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## Medical News

## Letters, Notes, and Answers

A meeting of the Middlesex County Medical Society will be held at Hillingdon County Hospital on Saturday, Jan. 8, at 2.30 p.m. when demonstrations of medical and surgical cases, pathological specimens, and new apparatus will be followed by papers by Dr. T. E. D. Beavan on chemotherapy in influenzal meningitis; Dr. C. G. Barnes on hypoglycaemia after partial gastrectomy; and Mr. L. Fatti, interim report on treatment of carcinoma of the lung.

At a meeting of the Pharmaceutical Society of Great Britain, to be held in the Society's house, 17, Bloomsbury Square, London, W.C., on Thursday, Jan. 13, the Hanbury Memorial Medal will be presented to Sir Henry H. Dale, M.D., P.R.S., Director of the Laboratories of the Royal Institution. After the presentation Sir Henry Dale will give an address on "The Natural History and Chemistry of Drugs." The chair will be taken by the President at 7 p.m., and a large attendance of members and friends is hoped for.

At a meeting of the Tuberculosis Association to be held at Manson House, 26, Portland Place, W.1, on Friday, Jan. 21, Mr. J. E. H. Roberts will give his presidential address at 3.15 p.m. on "A Surgical View of Timing." It will be followed by three short papers: "The Local Application of Promanide," by Dr. A. D. App (Toronto); "Some Observations on Tuberculosis of the Lungs and Larynx," by Dr. N. Lloyd Rusby; and "The Examination of Tuberculosis Contacts: A Minimal Scheme," by Dr. Brian Thompson.

A Radiotherapy Section meeting of the Faculty of Radiologists will be held at 32, Welbeck Street, W., on Saturday, Jan. 22, at 9 a.m., when there will be a discussion on "The Indications for and Effects of Irradiation of the Pituitary Gland."

A meeting of the Association of Industrial Medical Officers will be held at 11 a.m. on Saturday, Jan. 22, 1944, at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1. The morning session will be devoted to private business. In the afternoon a discussion will be held on injuries and infections of the hand. Openers: Mr. R. M. Handfield-Jones, F.R.C.S., and Dr. P. H. Jayes.

Series of lectures on the anatomy and physiology of the nervous system, suitable for a Diploma in Psychological Medicine, are being held this month at the Maudsley Hospital, Denmark Hill, S.E.5, on Mondays, Wednesdays, and Fridays, from 2 to 4 or 5 p.m., beginning on Jan. 3. The fee for the course is £3 3s., which is payable at the time of enrolment. Series of lectures on psychology and medical psychology will be arranged to take place during February, and all aspects of psychiatry required for Part II of the D.P.M. examination will be dealt with during the following months. All inquiries should be addressed to Dr. W. W. Kay, acting hon. director of the Maudsley Hospital Medical School, Central Pathological Laboratory, West Park Hospital, Epsom. Telephone No.: Epsom 1408.

The Nutrition Society has arranged two whole-day conferences in London on "Budgetary and Dietary Surveys of Families and Individuals," the first to be held on Saturday, Feb. 5, and the second in the early part of May. At the meeting on Feb. 5 at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., the chair will be taken by Sir John Orr. The matters for discussion are: (1) methods of budgetary and dietary surveys; (2) organization of large-scale surveys; (3) the statistical validity of methods used in such surveys; (4) relation of expenditure on food to other family expenditure. The speakers will include Mr. A. G. Jones (Ministry of Food), Dr. E. R. Bransby (Ministry of Health), Mr. F. le Gros Clark (Children's Nutrition Council), Prof. M. Greenwood, F.R.S., Dr. A. Bradford Hill, Prof. A. L. Bowley, Mr. D. Caradog Jones, and Dr. E. H. M. Milligan. Further particulars about the meetings and about the Nutrition Society can be had from the hon. secretary, Dr. Leslie J. Harris, Nutrition Laboratory, Milton Road, Cambridge.

The next special film session for doctors and allied personnel will be held at the Odeon Theatre, Broadmead, Bristol, on Sunday morning, Feb. 6, starting at 10.45. Among the films to be shown are "Mass Radiography" and recently completed films on head lice, tuberculosis, and nutrition and mass catering. Admission is free to doctors and qualified medical personnel only. Descriptive programmes may be obtained on application to the Medical Officer of Health, Kenwith Lodge, Westbury Park, Bristol 6. Early application is advised, as the number of seats available will be limited.

The Council of the Royal Medical Foundation of Epsom College will, in March next, award a "France" Pension of at least £30 per annum to a necessitous medical man, fully 55 years of age, who has been registered for five years. Forms of application for this pension may be had from the Secretary's Office, Epsom College, Surrey, and must be completed and returned by the morning of Jan. 31.

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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## ANY QUESTIONS?

## Angina Pectoris

Q.—*Many I have detailed information about the use of testosterone propionate and nicotinic acid in the treatment of angina pectoris. My questions are: (1) What is the right dosage of either of the two preparations in the treatment of angina? (2) In what cases of angina and for how long are they to be given? (3) What is the theoretical explanation of their use in angina pectoris?*

A.—The action of nicotinic acid in angina pectoris probably depends upon its vasodilating property. There is no standard dose, the correct one being the amount which produces the desired effect without producing unbearable flushing. Up to a gramme in many divided doses has been given. The action of testosterone propionate is probably similar, though other factors may possibly be involved. Hypogonadal patients treated with androgens usually experience an increased sense of well-being, and this fact may contribute to the good results reported. Angina is often a symptom of hypothyroidism, and testosterone raises the basal metabolic rate. In rats, male hormones increase the size and functional efficiency of the heart muscle fibres. Nevertheless it seems likely that the vasodilator effect of androgens is the important factor in the treatment of angina. The dose usually employed is 50 to 100 mg. a week of testosterone propionate intramuscularly. If good results are obtained, a maintenance dose of methyl testosterone may be given, the dose being four times the effective dose of the propionate. The tablets of methyl testosterone are put between the upper lip and the gum and allowed to dissolve slowly. Whether nicotinic acid or methyl testosterone is used, it is necessary to continue treatment indefinitely. Though good results have been reported by many observers, especially with androgenic treatment, I must confess that I have not been greatly impressed by my own experience.

## Delayed Menarche

Q.—*As medical officer to two large boarding schools for girls I am convinced there has been a large increase in the number of girls reaching the age of 16 without having ever menstruated. This has been noted during the last two years. What is the reason, and what is the most satisfactory treatment?*

A.—In matters of this kind it is misleading to draw conclusions from general clinical impressions, or even from careful notes which deal with a comparatively small number of cases. Many observers have done so in the past, and this explains the many varying statements in medical literature regarding the age of the menarche and the factors which affect it. It is commonly stated that the average age for the onset of menstruation in Great Britain is about 14 years and the upper limit of normal is 16. Yet W. P. Kennedy (*J. Obstet. Gynaec. Brit. Emp.*, 1933, 40, 792), in a review of 10,219 women of hospital class, found that 2,688 did not menstruate until they were 16 or over. The mean was  $15.037 \pm 0.011$ , with a standard deviation of 1.707. The inquirer should refer to this paper, in which he will find comparable figures published in Russia, Prussia, and Italy—each showing similar results.

There is general agreement that race, extreme climatic conditions, environment, social status, etc., can affect the age of the menarche. Thus, delayed puberty or amenorrhoea is said to occur more frequently in girls subjected to an "institutional life"—e.g., girls in boarding school and nurses during hospital training. But judging by the contrary statements as to the exact effect exerted by factors of this kind, it seems clear that most have been made on evidence which would not satisfy present-day scientific standards.

In view of considerations of this kind, the assumption in the question cannot be accepted without further data. Until it is proved it is pointless to enlarge on possible explanations, though it would be easy to postulate change in diet, the war and its attendant anxieties and strains, altered facilities for recreation, etc. It should

be remembered that it is common under any circumstances for menstruation to be delayed beyond the 16th birthday, and such delay does not necessarily imply any abnormality. The premature employment of any form of hormone therapy should therefore be avoided as needless and possibly harmful. In such cases attention should be paid to the girl's general physical and mental development. If this is normal, then the girl and her parents should be reassured. The only treatment necessary is to ensure that the girl is living a healthy life, not overworking, occupying her leisure hours suitably, and receiving a diet adequate in all respects. If, however, there is other evidence of endocrine disturbance, then complete investigation should be carried out to determine its nature before prescribing any hormone therapy. In a girl otherwise healthy in mind and body, amenorrhoea alone rarely justifies special investigation and treatment until she reaches the age of at least 17, and possibly 18 years.

#### Menopausal Arthritis

**Q.**—About the menopause women are very susceptible to muscular or arthritic pains for which no focal infection can be traced. So common is its incidence that, like flukes, many women attribute it to endocrine dysfunction. Does proof, apart from clinical, support this claim, and what have been the results of oestrogenic treatment?

**A.**—Apart from clinical observations there is little reliable evidence in support of the view that rheumatic disorders at the menopause are due to endocrine dysfunction. Tempelaar and van Breemen carried out observations on 142 women whose rheumatic disturbances were associated with the menopause or with irregularity of the menses, with a preparation of whole ovary and stated that the percentage improvement was lower among the controls than in those receiving ovarian substance (*Acta rheumatol.*, 3, No. 10, 13, 18, 19). F. C. Hall (*New Engl. J. Med.*, 1938, 219, 1015, and *J. Amer. med. Ass.*, 113, 1061) carried out a series of observations on 71 female castrates who developed joint symptoms a few weeks after operation. He gave 10,000 to 20,000 rat units of oestrogenic substance a week for six weeks, and in 40 of the 53 cases in which adequate treatment was given 70% were almost completely relieved of joint and muscular pain. It is suggested that arthralgia and arthritis appear to be phases of the same process due to excess of anterior pituitary hormone in the absence of ovarian hormone. Hench (*J. Amer. med. Ass.*, 113, 1062) found oestrone disappointing and Cecil had similar results. Monroe (*Chronic Arthritis*, Oxford Loose Leaf Medicine, London, 1939) states dogmatically that none of the ductless glands plays a part in originating any type of arthritis.

It is a striking feature from the clinical aspect that rheumatic symptoms develop far more often after the artificially induced menopause than in the natural course of events. In my opinion the probable explanation is that normally, as the supply of ovarian hormone falls, the thyroid takes over its functions in metabolism under the balancing influence of the pituitary. Should the supply of thyroid hormone be inadequate symptoms arise due to this, notably the development of a chronic villous synovitis of the knees and of dense fibrositic deposits in various parts, especially on the inner aspect of the knees and across the back of the neck, together with a slight lowering of the basal metabolism and a raised blood sugar. The factor determining the site of the rheumatic manifestations is mild trauma from overstrain, such as results from flat-foot and other deformities of the feet; frequently also there is a tendency to overweight. In favourable cases the thyroid will gradually overcome the deficiency; but where, as in the artificially induced menopause, the deficiency arises abruptly, symptoms appear more acutely. The use of oestrogenic substances is merely a substitution therapy and should be graduated accordingly so as to give the thyroid time to "catch up." Thyroid itself is generally more satisfactory except for the relief of more urgent developments, and in small doses in conjunction with iodine given over a long period is the most useful line of treatment. Reduction of strain by attention to foot deformities and the like, and by dieting to control any tendency to put on weight, are important adjuncts to the treatment.

#### Myxoedema and Pregnancy

**Q.**—A patient aged 34, mother of two children now aged 5 and 3, developed myxoedema a year ago. This responded to treatment, and she is now perfectly well on a maintenance dose of 2 gr. thyroid (dry ext.) daily. She has now become pregnant. (1) Is there any danger of cretinism in the baby? (2) Is modification of the dose of thyroid during pregnancy or afterwards likely to be necessary?

**A.**—There is no danger of cretinism in the baby, and it is unlikely that the dose of thyroid for the mother will require appreciable modification during or after pregnancy. A cretin baby may be produced when there is endemic goitre, but not because a mother is suffering from spontaneous myxoedema. In fact Parkin and Greene (*J. clin. Endocrinol.*, Aug., 1943) have recently recorded cases of juvenile and adult myxoedema on which pregnancy has supervened

although they were quite untreated before pregnancy, and in which the baby was completely normal, though no treatment with thyroid was given during pregnancy. Incidentally it is rare for pregnancy to occur in a woman with untreated myxoedema.

#### Intractable Acne

**Q.**—I would be grateful for advice on a persistent case of acne vulgaris and pustularis in a youth of 16. He is dark-haired with a greasy skin. The eruption is present on his back, forehead, chest, and nuchal areas. There is much scarring from old pustules, but I am more concerned at the continual outbreak of pustules. He is on an antiseborrhoeic diet, free of fried food, grease- and fat-free, and no sweets. I insist on daily baths with medisoap No. 67, and I have given him erythematous doses of local ultra-violet light. He is also using a zinc sulph., potass. sulphurata, and acetone lotion, and I am now giving an autogenous *Staph. aureus* vaccine. A radiologist is giving him superficial x rays once weekly. Is hormone or stock acne bacillus vaccine of any value?

**A.**—Acne vulgaris is a chronic and rebellious disorder; it may be assumed that the youth of 16 will continue to be affected for months or years. The record of the treatment already given follows the recognized lines and can be continued. As x-ray treatment must be strictly limited, later the U.V.R. can be resumed. Although various hormonal substances have been used for acne, the results have not been encouraging, and this also applies to acne bacillus vaccine. Massage with a Bier's cup is occasionally of value.

#### Lint: Which Side?

**Q.**—Which side of the lint should be placed next to the wound? I have always used the smooth side, but several times lately I have heard it stated that the fluffy side is specially prepared to have a "velvety" softness, and therefore should be placed next to the skin. This is perhaps too small a matter for publication under "Any Questions?"

**A.**—When lint—i.e., fluffed linen, both words being derived from *linet*—flax) was first introduced its use was chiefly as an external application—often with added medication—to the unbroken skin. For this purpose the soft fluffy side is ideal from the comfort point of view, and it also holds plenty of the medicament—e.g., Scott's dressing. When used on a raw surface the smooth side (non-fluffed) is the better one to apply to the wound, but it is probable that other materials—gauze, etc.—are best for this purpose.

#### INCOME TAX

##### Commencement of Practice

L. G. commenced a practice in March, 1943, in succession to a deceased practitioner. He has already been assessed for the year 1943-4 and the inspector of taxes informs him that he will be liable to account for the first instalment of the tax in January, 1944.

The inspector is acting legally, but L. G. is entitled, of course to give notice of objection to the assessment, pointing out that the correct liability cannot be calculated until after his accounts to the end of March, 1944, are made up. In the meantime he is entitled to decline to pay on any amount in excess of the probable (or undisputed) liability, and if necessary the Commissioner of Taxes can be asked to decide what amount he should pay. Whether the inspector would be prepared to put all parties concerned to the trouble of such proceedings in order to ensure that tax is paid in, say, February instead of, say, May is doubtful.

#### LETTERS, NOTES, ETC.

##### A Rare Presentation

Dr. LEONARD LEY (Great Yarmouth) writes: The following note of a rare condition may warrant publication. I was called in by the midwife because of delay in delivery of a second twin (the first, a girl, had been born 4 hours with a tear of the perineum). When I arrived pains were strong. Presentation with head well down was vertex anterior. I gave pituitrin. The head was delivered and I freed the chin. I then saw first one hand and then the other present alongside the face. I eased the arms out and then delivered the foetus to the upper end of the sternum. As this level of the trunk appeared toes and a foot (the left) presented and lay under the chin. I have dealt with some 2,000 confinements and have mentioned this case to two colleagues who have probably done 2 many or more, and none of us has seen or heard of such a happening. This child was a male.

##### Corrigendum

Prof. GEOFFREY JEFFERSON wishes to point out that the top two illustrations at page 3 of his paper on "The Nature of Concussion" in our issue for Jan. 1 refer to Case 2 and Case 1 respectively. The lower one illustrates Case 3.

## CLINICAL FEATURES AND TREATMENT OF MALARIA IN BRITISH TROOPS IN WEST AFRICA

BY

S. B. HUGHES, M.D.

Capt. R.A.M.C.: Graded Physician

AND

R. R. BOMFORD, D.M., F.R.C.P.

Lieut.-Col. R.A.M.C.: Officer in Charge of a Medical Division at a Military Hospital;  
Assistant Physician to the London Hospital

"The symptoms of this fever, it is to be regretted, are so various and irregular, in different cases and under different circumstances, that a mere nosological definition of them would afford no precise information and might mislead those it was intended to instruct." Since Boyle in 1831 wrote these words in his gloomy *Account of the Fevers of Western Africa* the prognosis of subtertian malaria has greatly altered, but the diversity of its manifestations has not. Modern textbooks may claim to provide more than a mere nosological definition, but they tend to emphasize the severer and rarer types of the disease to the exclusion of its commoner and milder, though no less protean, forms. As the latter are prevalent in troops in West Africa at the present time and are not uncommon in those returning to this country, we believe that a fresh description of them may be of value. Pernicious types will receive little notice, as in our experience they occurred infrequently, and methods of investigation requiring more than the simple use of the microscope will hardly be mentioned.

The description is based on over 1,200 cases seen and treated by one or both of us in two military hospitals in West Africa in 1941 and 1942. Where figures are given these refer to 846 unselected cases in 584 patients from one hospital in each of which the diagnosis was confirmed by the finding of malaria parasites in the blood. In 380 cases the parasites were diagnosed as *Plasmodium falciparum*. In the remainder no diagnosis of the type of parasite was attempted, but it can be assumed for the purpose of this paper that all or nearly all were due to *Pl. falciparum*, since in no instance did the appearance of the parasite or the clinical features of the disease suggest the contrary, and workers in the district concerned agree that other types of malaria are rare, occurring, when they do, usually in visitors who have been infected elsewhere.

Our account deals with a group of white males aged 18 to 51 who had been passed as fit for overseas service, who were in most cases in a malarious district for the first time, and amongst whom the observance of antimalarial precautions and the taking of a suppressive drug were enforced, so far as they could be, by disciplinary measures. Further, in British West Africa subtertian malaria is for the most part hyperendemic and, on account of the climate and the varying habits of the principal anopheline vectors (*A. gambiae*, *A. gambiae* var. *melas*, and *A. funestus*), infections, though commonest in the wet season, occur all the year round. Conclusions based on the study of a particular type of patient in an area with particular characteristics are not necessarily applicable to other types of patient in other areas.

### Previous Descriptions

We know of no previous account of the clinical features of malaria in white troops in West Africa. Small groups or single cases of the disease, acquired in West Africa but treated in England, have been described by Fawcitt (1940), Fawcitt and Walters (1941), Murray and Shute (1942), and Anderson and Bradshaw (1943); and treatment has been discussed by Hughes (1942), Hill (1942a, 1942b), and Hughes and Murgatroyd (1943).

### The Clinical Types of Malaria

Malaria has been described as the great mimic of other diseases. To illustrate this fact, which is of great importance in diagnosis, we have divided our cases into clinical types, according to the principal feature of the attack, much in the same way as did Falconer and Anderson (1917) and Manson-Bahr (1920) in their respective descriptions of malaria in the Salonika and Egyptian Expeditionary Forces of the last war. While the exact pathogenesis of these types can only be a matter for speculation, it was noticeable that patients who had repeated attacks showed no predilection for a particular type of the disease.

The "types" described below accounted for 818 of our 846 cases. The remainder consisted of 24 particularly mild cases in which the patients had no fever and complained only of headache and slight malaise, and 4 cases with jaundice as the principal feature, which will be mentioned under the heading "Complications."

#### 1. The Febrile Type

In this type (684 cases) fever itself was the main feature. The onset was usually quite sudden, with chilly feelings or shivering, soon followed by feverishness. During the hot stage, which lasted from 10 to 36 hours, the temperature was raised to 103 or 105°, and the patient complained of burning heat and great discomfort or was quite prostrated. In most cases this stage ended with profuse perspiration, a fall in temperature, and a sense of great relief, to be succeeded by an apyrexial interval, whose length was from a few to 36 hours and which often varied inversely with that of the preceding hot stage. While afebrile the patient felt quite well or complained only of slight headache. In some cases there was no apyrexial interval, and symptoms continued till the fever was controlled by an antimalarial drug.

During the febrile stage headache, backache, and generalized aches and pains were usually present. Pain in the back of the neck and aching across the shoulders, associated sometimes with stiffness in these regions, were common complaints, as were also aching in the eyeballs and pain behind the eyes, aggravated by moving them. Vomiting occurred in about a third of these cases in the febrile stage, and in some instances was very distressing, being accompanied by much retching. Some patients complained of abdominal pain, either diffuse or localized in the left hypochondrium or epigastrium, and others of pains in the chest which suggested intercostal myalgia or pleurisy or were of an indefinite nature. In some of the cases included in this type the symptoms were milder, and the patients had often remained at duty for several days before reporting sick.

Rigors occurred on only 22 occasions, and are therefore rare in malaria of this type. Their occurrence should suggest the possibility of the onset of blackwater fever and call for the keeping of a close watch on the patient and his urine.

## II. The Gastro-intestinal Type

Gastric, diarrhoeic, and dysenteric forms were recognized.

(a) *Gastric*.—Vomiting was the principal feature in the 11 cases of this type. Epigastric discomfort, at times amounting to actual pain, and constipation were usual, and headache and backache were complained of on occasion. The fever was mild in all instances, and the vomiting differed from that which occurred in the febrile stage of cases of the previous type in that, though more persistent, it was less distressing and was not associated with retching. The symptoms were continuous or irregularly intermittent, except in one case in which they recurred on alternate days. Some of these patients were sent to hospital with a diagnosis of "dyspepsia" or "acute gastritis." In all instances the symptoms cleared up rapidly when antimalarial treatment was instituted.

*Illustrative Case*.—Sgt. T. was admitted to hospital with a history that four nights previously he had complained of nausea and vomiting, and these symptoms had continued all the next day. Two days before admission he had been free from symptoms and felt well till the evening, when nausea and vomiting returned. The symptoms had continued all the next day, and were associated with epigastric discomfort and complete anorexia. On the day of admission he felt better but weak. No malaria parasites were found in films of his blood. That night he complained again of epigastric discomfort, vomited repeatedly, and his temperature rose to 100.4°. On the following day his spleen was palpable, malaria parasites were present in blood films, and quinine bisulphate gr. 10 t.d.s. was prescribed. He made a rapid and uninterrupted recovery.

(b) *Diarrhoeic*.—The principal feature in the 60 cases of this type was simple diarrhoea, accompanied in most instances by colicky abdominal pain of varying severity. In a third of the cases this began suddenly, and was associated with headache of mild severity and vomiting of short duration. In the remainder diarrhoea, mild colicky abdominal pains, and a feeling of malaise had been noticed for several days before the patient felt ill enough to report sick. These patients had few symptoms apart from their intestinal ones, and were sometimes sent to hospital merely for the investigation of a diarrhoea which had failed to respond to the usual remedies. None had high fever and 11 of them had no fever while in hospital. The stools were watery, did not contain blood or mucus, and varied from 5 to 18 or more in the 24 hours. In the majority of cases the diarrhoea was continuous, but in some it occurred on alternate days. The stools were examined microscopically in every case; in the majority nothing abnormal was detected, but in about a quarter of them pus and red blood cells were present. They were cultured on a number of occasions, but no organisms of pathogenic significance were isolated.

*Illustrative Case*.—Pte. B. was admitted to hospital with a history of diarrhoea and colicky abdominal pain for six days. His motions had been watery and had numbered between seven and ten daily. He had never noticed blood or mucus, and did not complain of other symptoms. His temperature was 100.6°, pulse 74, and respirations 20. He had mild angular conjunctivitis, the lower edge of the liver was palpable and tender, but no other abnormal signs were present. During the first two days in hospital no malaria parasites were found in blood films; microscopical examination of the stools showed some pus and red blood cells only, and culture of them revealed no abnormality. On the third day malaria parasites were found and treatment with quinine was begun. The temperature became normal in 48 hours and the diarrhoea disappeared on the third day of treatment.

(c) *Dysenteric*.—In 12 cases of this type diarrhoea, with blood and mucus in the stools, was the main feature, and was accompanied by headache, fever of moderate severity, and abdominal pain. The onset was almost always sudden; the fever and constitutional disturbance were greater than in cases of the previous type and the diarrhoea was more profuse and distressing, as many as 30 motions being passed in 24 hours. Backache was complained of in a few cases; vomiting was unusual, and tenesmus quite exceptional. The stools were cultured repeatedly, but no pathogenic organisms were discovered.

*Illustrative Case*.—Sgt. G. was admitted to hospital with a history of diarrhoea, with blood and mucus in the stools, 25 having been passed in the previous 24 hours. He had complained of headache on the evening before admission and stated that he had had a temperature of 102° at the same time. On admission his temperature was normal and his tongue slightly furred; no other abnormality was discovered on physical examination, and no malaria parasites were

found in blood films. The stools contained pus and red cells, but no pathogenic organisms were grown on culture. On the following day his condition was unaltered until the evening, when he complained again of headache and generalized aching and his temperature rose to 101°. On the third day his temperature was normal, but bloody diarrhoea continued and films were still negative for malaria parasites. On the fourth day malaria parasites were found in blood films, and quinine bisulphate gr. 10 was administered thrice daily. Three days later his bowels acted normally and thereafter he made an uninterrupted recovery.

We saw no case of malaria of an appendicular type in West Africa. We did, however, see one of true appendicitis in a patient with malaria. Since returning to this country one of us has seen a typical case of malaria simulating acute appendicitis. The presence of a leucopenia was the main differentiating feature, and the condition cleared up rapidly when treatment with quinine was started.

## III. The Respiratory Type

In 39 cases the main clinical feature was an acute or subacute bronchitis, patients with a previous history of chronic or recurrent bronchitis being excluded from this group. The symptoms varied from the acute respiratory distress of an asthmatic attack to a moderate degree of cough and expectoration. Some fever was the rule, but in a few instances it was insignificant in degree or absent. The attack usually began abruptly with headache, backache, and generalized aching. After a variable period respiratory symptoms appeared. The cough, at first dry and unproductive, soon became looser, but expectoration was seldom profuse. Wheezing and vomiting occurred in some instances. Rales and rhonchi were heard on physical examination, and in a few cases the clinical picture suggested the presence of a bronchopneumonia; but radiographs of the chest did not confirm these clinical findings.

*Illustrative Case*.—S/Sgt. P. was admitted to a hospital with a history of a few hours' feverishness, headache, generalized aching, and vomiting. His temperature was 102°, pulse 88, and respirations 24. He was wheezing and had considerable respiratory distress. On examination of the chest numerous sibilant rhonchi were heard in all areas. Malaria parasites were present in a blood film, and quinine bisulphate gr. 10 t.d.s. was prescribed. Seven hours later he had a profuse perspiration, but wheezing continued and he was given a hypodermic injection of adrenaline with good effect. He was better next morning, with only slight wheezing, and expectorated abundant frothy sputum, but the same evening his acute symptoms returned. On the following day the sputum became mucopurulent and the spleen was palpable, but the symptoms abated. On discharge 12 days after admission he complained of slight cough only and the spleen was no longer palpable.

## IV. The Myalgic Type

In 10 cases the main feature was muscular pain and stiffness. In six of them there was no fever and in three no more than slight fever. The onset was usually acute, with pain localized to the affected muscle or muscles, and constitutional symptoms were slight or absent. On examination the affected muscles were tender and in spasm, and active or passive movement caused acute pain. The muscles most often affected were the lumbar, the intercostal, and those of the neck, either singly or in combination. Rest, salicylates, and heat provided temporary relief; but only when malaria parasites were demonstrated in the blood and the appropriate treatment was administered did complete recovery ensue.

*Illustrative Case*.—Sgt. T. was admitted to hospital complaining of pain and stiffness of the right side of the neck that had come or suddenly two days previously. There was tenderness and spasm of the right sterno-mastoid and of the cervical portion of the right trapezius, and the condition differed in no way from an ordinary acute torticollis. No other abnormal physical signs were noted, and a blood film revealed no malaria parasites. Salicylates by mouth and radiant heat and massage were prescribed without beneficial effect. Two days later, as no improvement had taken place, further blood films were examined: malaria parasites were demonstrated and quinine bisulphate gr. 10 t.d.s. was administered. The pain was much improved in 48 hours and the condition cleared up completely in five days. The patient had no other symptoms and was afebrile throughout.

## V. The Cerebral Type

The 2 patients in this series had cerebral symptoms. The first was conscious, but was completely disorientated, had some motor aphasia, and was afflicted with severe muscular



itchings. The second was delirious and gravely ill, with dry brown tongue, a paralytic squint, and a left extensor plantar response. Both recovered completely.

### General Features

The following features applied to some extent to all types of cases.

**Onset.**—This was sudden in the majority of cases, but in minority (152) was preceded by a prodromal period, lasting on a few days to a few weeks of malaise, headache, asthude, backache, or diarrhoea.

**Symptoms.**—The main symptoms of the attack, irrespective of type and in order of frequency, were headache (770), backache (486), shivering (253), vomiting (234), feverishness (233), in the back of the neck (184), generalized aching (180), ght cough (169), sweating (153), and simple diarrhoea (134). Constipation (61) was the exception.

**Temperature.**—Quotidian intermittent fever was seen in 45 cases; tertian intermittent in 49; subtertian intermittent in 53; regularly intermittent in 87; remittent in 75; continuous in 1; "low fever" (pyrexia not exceeding 100°) in 91; and no fever throughout in 50. In 366 cases the fever did not last long enough to be of any special type.

**Pulse Rate.**—Relative bradycardia was a principal feature of the disease as seen by us in West Africa. An analysis of the pulse-temperature ratio is as follows:

Temperature	Corresponding Average Pulse Rate per Minute	No. of Observations made
106°	102.0	59
104°	87.2	177
103°	91.6	177
102°	86.5	177
101°	83.9	177
100°	79.2	177

**Urine.**—Albuminuria, varying from the presence of a trace to a heavy deposit in the boiled specimen, was reported on occasions, and reduction of Fehling's solution in 17 cases. Others were transient features.

### Physical Signs

The spleen was palpable on admission in 315 cases, at some time during the acute attack in 462 cases, and on discharge approximately two weeks after admission in 137. Tenderness of the splenic region was noted in 114 cases. The liver was normally palpable in 32 cases, the greatest degree of enlargement being to three inches below the costal margin; and tenderness of the liver on palpation was noted in 61. Diffuse dominal tenderness was noted in 19 cases and slight dominal rigidity in 7. The tongue was usually moist and an, and was never more than slightly furred in uncomplicated cases. Angular conjunctivitis in some degree was not common, and a faint icterus of the conjunctivae without noticeable involvement of the skin was seen occasionally. Ronchi were heard in the chest in 136 cases, sometimes accompanied by rales.

### Complications

**Chronic Malaria.**—Out of 584 patients 6 were considered, or several acute attacks, to be suffering from chronic malaria. Such patients usually complained of chronic headache, fatigue, and general ill-health. They looked sallow, and some degree of splenomegaly—the spleen being harder in consistency than that commonly felt in acute attacks—an aemia of slight to moderate degree with leucopenia and a relative lymphocytosis, and had often lost weight. In many instances of so-called "chronic malaria" the objective signs are slight, the symptoms appeared to be mainly emotional, and simple psychotherapy was more needed than drugs.

**Blackwater Fever.**—Four patients out of 584 developed this complication, and two of them died.

**Jaundice.**—Definite jaundice was seen in 11 cases and slight icterus of the conjunctivae in 14. Three types of jaundice were recognized: (i) The acute haemolytic jaundice of blackwater fever. (ii) Slight icterus of the conjunctivae only, which was present during the acute attack and was presumably due to haemolysis. (iii) Jaundice, usually of moderate severity, with clay-coloured stools and dark urine, indistinguishable

clinically from catarrhal jaundice or infective hepatitis. In four cases this was present on admission, and in two it appeared during treatment with mepacrine. As in at least two cases, not included in this series, similar jaundice appeared during treatment with quinine, it is unlikely that mepacrine was responsible for it.

**Herpes Inibialis** occurred in 41 cases and herpes nasalis in 5.

**Generalized urticaria** occurred in 3 cases—in two during treatment and in one at the onset of the attack.

### Severity and Prognosis

In less than 10% of these cases could the patient be described as severely ill and in less than 1% as dangerously ill. Of those described as severely ill the majority were simply patients who responded unusually slowly to treatment, and these probably corresponded to the 12% of patients shown by Howie and Murray-Lyon (1943) to absorb or metabolize abnormally quinine given by mouth, as disclosed by the irregular occurrence or absence of positive Tanret reactions in the urine. Out of 584 patients 14 (2.4%) were invalided home, the indications being chronic malaria (7), recovery from cerebral malaria (2), recovery from blackwater fever (2), anaemia (1), persistent jaundice (1), and haemolytic jaundice of uncertain origin (1). There were no deaths from uncomplicated malaria. Two patients out of 584 died from blackwater fever—a mortality rate for the whole series of 0.34%.

We believe our account to show that, given favourable conditions, malaria in West Africa at the present time need not enjoy the evil reputation that it has. The disease is potentially a very dangerous one, and its apparent mildness may occasionally prove its most subtle danger; but unnecessary exaggeration of the dangers of the average case causes needless alarm and contributes to disability from "tropical neurasthenia."

### Diagnosis

Films were usually taken at 12- to 24-hourly intervals, and in 968 cases parasites were found at the first examination in 57%, at the second in 22%, at the third in 5%, at the fourth in 3%, and at the fifth and sixth in under 1% (an "examination" for this purpose meaning the search of a thick film for not less than 10 minutes); while in 13% parasites were not found and the condition was treated as "clinical malaria."

When the clinical findings are equivocal it is wise to examine repeated blood films, but the above figures show that parasites will usually be found, if they are going to be, in the first two or three examinations. With us the apyrexial interval was as favourable as any other time for the finding of parasites, for out of 816 positive films 389 were taken when the patients were afebrile.

While films are being taken for the diagnosis of equivocal cases in hospital the administration of a suppressive drug should be discontinued, as the parasites are then more likely to be found. We have never seen any harm come of this practice. Patients in hospital for any other purpose should continue to take their suppressive drug, and patients undergoing surgical operations should be given 10 gr. of quinine or 0.1 g. of mepacrine daily. If this is not done an attack of malaria two or three days after the operation is not uncommon, and at best adds considerably to the patient's discomfort.

### Treatment

In a district of the type described here it is likely that most residents become and remain infected with malaria. Many of them must be regarded as living in a state in which the forces of infection and of resistance are in a somewhat precarious balance, and a clinical attack may result from anything which serves even temporarily to reduce the powers of resistance—such, for instance, as a surgical operation, an intercurrent infection, or an interruption of suppressive treatment. Since there is at present no known drug treatment that will terminate human infections and there is reason to believe that immunological processes play a considerable part in their control (Coggeshall, 1943), the objects of treatment in such an area must be to aid natural resistance to the disease and by the use of drugs to suppress or abort clinical attacks.



While little is known of the nature of the immunological processes involved, it is reasonable to suppose that they will be aided by the maintenance of a high standard of general health, and in practice measures to this end do appear to be important. In our experience ambulant patients or those treated in their own quarters did not regain a feeling of well-being as quickly as those kept in hospital for an adequate period, and they had a greater tendency to early relapse, though the same course of drugs may have been administered in each case. We had an impression that the same applied to patients receiving an unnecessarily large dosage of drugs. Whatever drugs are given patients should, except in an emergency, be treated in hospital and should remain there for a minimum of 12 to 14 days. It is false economy to treat patients otherwise or to cut short their convalescence.

We believe that this principle could be carried further and that the provision of convalescent camps in West African stations is a measure which would save its own cost by reducing disability from malaria. Such camps should be situated in relatively healthy areas, preferably with facilities for bathing and other recreation; and convalescence in them should be planned, and should include graded exertion so that return to normal duty does not involve a sudden unaccustomed strain. *The Medical History of the War, 1914-18*, describes the provision of such camps as "a practice which obtained recognition during the war," and states that convalescence should last at least three weeks.

#### Treatment of the Acute Attack

In the height of the fever patients were nursed in blankets. Warm sponging, drying, and changes of clothing as often as necessary added considerably to their comfort. The disadvantage of sedatives is that they usually produce profuse sweating without relief of symptoms. We began by treating all our patients with a full course of quinine, mepacrine, and pamaquin, under the assumption that the more "thorough" the treatment the less likely was the occurrence of relapses. This assumption was not justified, for we found that our return cases were no less numerous than anyone else's. We next tried treating the patients in one ward with quinine followed by pamaquin, and those in another with mepacrine followed by pamaquin. We found that patients in the quinine-pamaquin ward became apyrexial and free of symptoms quicker than those in the mepacrine-pamaquin ward, but thought that return cases were less common in the mepacrine-pamaquin ward than in the quinine-pamaquin one. We next abandoned pamaquin for routine use because:

- (i) It is doubtful whether pamaquin has any anti-relapse value in malignant tertian malaria (Sinton and Bird, 1928).
- (ii) The destruction of gametocytes, which pamaquin does achieve, is of little importance in Europeans in a hyperendemic area where there is a huge reservoir of infection in the native population.
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- (iv) Haemoglobinuria had been reported in patients under treatment with pamaquin (Sinton, Smith, and Pottinger, 1930; Mann and Smith, 1943), and we heard of a few recent cases of blackwater fever during administration of this drug.
- (v) We were unable, as was not the case with quinine and mepacrine, to demonstrate to ourselves that in the treatment of our patients pamaquin had any value other than the destruction of gametocytes.

After abandoning the use of pamaquin we settled on a routine course of quinine by mouth for two days (sometimes extended to three if the fever had not fallen to below 100° at the end of 48 hours), followed by mepacrine for six days. This modification produced no evident deterioration in our results; patients who had been treated by the earlier methods stated that they felt better after the modified course, and the proportion of cases returning within three months was distinctly less after this treatment than after the previous ones. Quinine was given as a solution of such salts as were available, in doses of 10 gr. t.i.d. if necessary in an acid mixture. Mepacrine was given in doses of 0.1 g. t.i.d. If vomiting occurred we substituted for the usual quinine mixture quinine bishydrochloride in tablet form, and found that this could be taken in most cases.

We used quinine by injection in all cases considered to be suffering from pernicious forms of the disease, in a few cases in which even tablets of quinine bishydrochloride were vomited, and in very occasional and quite exceptional cases (less than 1%) which did not appear to be responding to quinine by mouth. The routine use of quinine injections, as recommended for instance by Wingfield (1943), even granted that a high proportion of severe cases may be seen in England, seems to us excessive and unnecessary.

As our patients were kept in hospital for 12 to 14 days in any case we did not give quinine and mepacrine simultaneously; but there is no objection to this practice, and mepacrine acts slowly it may with advantage be begun 24 hours before quinine is discontinued. If mepacrine alone is used the initial doses should be greater than 0.1 g., but the optimum dosage for this purpose remains to be determined. We have recently used an initial dose of 0.8 g. followed by 0.1 g. t.i.d. in a few cases in England with good results.

As soon as the course of treatment was completed our patients returned to their usual suppressive dose of quinine or mepacrine.

#### Treatment of Pernicious Attacks

These must always be regarded as medical emergencies, and should be treated promptly and, in the initial stages, by injection. We do not propose to enter into the controversy as to the best route for the injection of quinine. We use both intravenous and intramuscular injections on occasion without encountering ill effect. In a patient who is conscious and can take quinine by mouth and absorb it (as shown by the Tanret test in the urine) nothing was gained, in our experience, by giving more than two or at most three parenteral injections. In comatose patients or those unable to take or absorb drugs given by mouth, parenteral injections must be continued till the symptoms are controlled. Intravenous glucose and saline may be necessary to prevent dehydration. In a few cases we tried reconstituted plasma as suggested by Fawcett and considered the results promising. In patients with cerebral malaria who failed to respond to other measures therapeutic lumbar puncture seemed to be of value.

#### Suppressive Treatment between Attacks

The taking of a small dose of so-called "prophylactic" quinine has been customary among Europeans on the West Coast for at least a century, and is strongly recommended by most local practitioners of experience. This measure is undoubtedly of some value, and is considered essential for troops under active-service conditions. In practice the results are not quite according to theory, and a varying degree of individual susceptibility appears to be of importance; for some individuals can go for long periods with no suppressive drugs and have little or no malaria, while others have repeated attacks in spite of them.

In dealing with troops under active-service conditions exertions cannot be made, and the taking of a suppressive drug on parade and under the supervision of an officer is enforced. It is likely that mepacrine will replace quinine for this purpose in troops in West Africa, and according to Hill (1942a, 1942b) doses of 0.1 g. daily can be taken with good effect and without the appearance of toxic manifestations. It is important that persons leaving malarious districts of this type should be instructed either to continue with their normal dose of suppressive drug for at least two months after they have left the area or to continue this dose for two weeks and then take mepacrine 0.1 g. thrice daily for five or six days.

#### Summary

846 unselected cases of malaria in British troops in West Africa, every one confirmed by the finding of parasites and presumably almost all subtertian in type, were divided according to the principal clinical feature of the attack into febrile, gastric, diarrhoeal, dysenteric, respiratory, myalgic, and cerebral types.

While its apparent mildness may occasionally prove the most subtle danger, under the conditions stated, which include compulsory personal antimalarial precautions and taking of suppressive drugs, the prognosis in ordinary cases was excellent, and pernicious attacks and complications were very rare. Only 14 patients died, both from blackwater fever, and 14 were invalided home.

After various modifications in treatment the routine use of pamaquin was abandoned. The most generally useful course of drugs in uncomplicated cases was found to be quinine gr. 10 t.d.s. by mouth for two or three days, and mepracine 0.1 g. t.d.s. for six days, the two drugs being with advantage "overlapped" for 24 hours. The patient's usual dose of a suppressive drug was resumed as soon as the course was finished, and an adequate period of convalescence was regarded as of the greatest importance.

Our thanks are due to Col O. J. O'Hanlon, officer commanding a military hospital, for permission to publish this article; to Col. John McFadden and A. McKie Reid for according us facilities for the investigations; to Major I. B. Morris for most of the pathological investigations; to Major J. W. Howe for helpful criticism; and to Dr. A. M. Gillespie, Senior Medical Specialist, Accra, for advice on many occasions.

## REFERENCES

- Anderson, W. L., and Bradshaw, D. B. (1943). *British Medical Journal*, 1, 508.  
Boyle, J. (1831). *A Practical Medico-Surgical Account of the Western Coast of Africa*, p. 127. London.  
Coggshall, L. T. (1943). *Medicine*, 22, 87.  
Fakoner, A. W., and Anderson, A. G. (1917). *Lancet*, 1, 607.  
Fawcett, J. D. (1940). *Lancet*, 2, 44, 9.  
— and Walters, A. H. (1941). *British Medical Journal*, 1, 14.  
Hill, T. R. (1942a). *Trans. Roy. Soc. Trop. Med. Hyg.*, 36, 70.  
— (1942b). *Ibid.*, 36, 75.  
Howe, J. W., and Murray-Lyon, R. M. (1943). *Lancet*, 2, 317.  
Hughes, W. (1942). *Trans. Roy. Soc. Trop. Med. Hyg.*, 36, 60.  
— and Murgatroyd, F. (1943). *Lancet*, 1, 699.  
Mann, W. N., and Smith, S. (1943). *Trans. Roy. Soc. Trop. Med. Hyg.*, 37, 151.  
Manson-Bahr, P. (1920). *Lancet*, 1, 79.  
— (1922). *In History of the Great War—Medical Services—Diseases of the War*, 1, p. 276. London.  
Murray, J. E., and Shute, P. G. (1942). *Lancet*, 2, 365.  
Nelson, J. A., and Bird, W. (1928). *Indian J. med. Res.*, 16, 159.  
— Smith, S., and Pottinger, D. (1930). *Ibid.*, 17, 793.  
Virgfield, A. (1943). *British Medical Journal*, 1, 770.

## DESPECIATED BOVINE SERUM (D.B.S.): A SUBSTITUTE FOR HUMAN PLASMA

BY

F. RONALD EDWARDS, M.D., Ch.M., F.R.C.S.

Assistant to the Professor of Surgery, University of Liverpool

(From the Department of Surgery, University of Liverpool)

The use of plasma in surgical treatment is increasing rapidly, and further studies of the condition of hypoalbuminaemia and its relation to post-traumatic and post-suppurative cachectic states and to delayed wound-healing envisage a still greater demand for plasma protein therapy. The panels of donors and blood banks organized throughout the country have hitherto provided a convenient supply of a protein solution, but the investigation of an alternative source is indicated in view of the future need for this material.

Any plasma substitute must have the following characteristics: (a) it should be retained in the circulation and eventually be metabolized; (b) it should exert an osmotic pressure equivalent to that of plasma; (c) it should be non-toxic, free from antibodies, and non-antigenic. An attempt to produce such a material was made by Bayliss in 1916, when he introduced 6% gum-acacia in saline as a substitute for blood in the treatment of shock (Bayliss, 1917). This material had a very considerable efficiency, but it was only partially metabolized. Much of it remained permanently in the tissues, and many unpleasant sequelae occurred (Hanzlik and Karsner, 1920; Jaylum and Magath, 1932; Yuile and Knutti, 1939; Andersch and Gibson, 1934).

Other organic substances suggested have been isinglass (Taylor and Waters, 1941), pectin (Hartman *et al.*, 1941), gelatin (Gordon *et al.*, 1942), and methyl cellulose (Hueper, Martin, and Thompson, 1942); but they must be absolutely pure, and in the case of the first three this standard is very difficult to obtain. Furthermore, the effective metabolism of such foreign material is very much in doubt. More recently periston (polyvinyl pyrrolidone) has been put forward in Germany (Hecht and Veese, 1943); it has a very high osmotic action, and the claim is made that it will remain in the circulation for two days and be excreted in 3 to 4 weeks. All these substances may have some beneficial effect in maintaining blood volume in shock and haemorrhage, but will have little or no value in restoring loss of blood protein.

The substance most nearly approaching human plasma protein in character, and one which is available in quantity, is animal plasma protein. Unlimited quantities may be obtained in the abattoirs in the form of animal serum. A comparison of the protein constituents of human blood with those of the blood of the animals of which practical use may be made is shown in the following table (Howe, 1925):

	Human	Cow	Horse	Sheep
Total protein, g. %	7.49	7.43	6.10	5.74
Fibrinogen "	0.30	0.72	0.34	0.36
Globulin "	2.73	3.50	2.49	2.31
Albumin "	4.45	3.21	3.27	3.17
Albumin:globulin ratio	62.0:38.0	47.8:52.2	56.6:43.4	57.1:42.9

In total protein, bovine blood most nearly approaches human blood, but there is a much higher percentage of fibrinogen, which, however, is eliminated in the preparation of the serum. Howe's figure for the total protein of bovine blood refers to elderly animals, bullocks usually having a much higher content than this (see below). The albumin:globulin ratio is lower, too, in bovine blood, which might result in a lower osmotic pressure than with human serum, as the albumin fraction, having a smaller molecule, exerts the greater pressure. As bovine serum is obtainable in the largest quantity, however, this material has been utilized in the following investigation.

### Administration of Animal Sera

The infusion of animal sera of full protein content has up to the present been generally unsatisfactory, owing to the high percentage of unfavourable reactions. Kremen and his co-workers (1942) recently gave crude bovine serum an extensive clinical trial in 120 cases, and have declared it unsuitable for general use for the following four reasons: (1) all recipients must be tested by an intradermal dose, positive reactors (approximately 50%) to which do not take the serum well; (2) approximately 60% of the recipients have an immediate reaction after infusion of less than one pint; (3) serum sickness developed in 60% of those cases to which it was possible to administer any quantity of the serum; (4) the rate of administration was so slow as to be practically useless in shock. These authors attempted, furthermore, to absorb the agglutinins on to washed human red cells by mixing these with the serum; but this was only partially successful, and there was a tendency to haemolysis of the human red cells. The incidence of immediate reactions decreased somewhat, but serum sickness was just as prevalent.

### Characteristics of Crude Bovine Serum

Crude bovine serum is orange in colour and of a slightly higher viscosity than human serum. We have found the total protein content to vary between 7.5 and 9.5 g.%, the higher figure being obtained in bullocks (Folin and Ciocalteu's colorimetric method). The values for sugar, chlorides, non-protein nitrogen, and potassium were approximately the same as for human serum. *In vitro* tests showed that when bovine serum was mixed with 50 different samples of human red cells of all groups agglutination occurred rapidly. The titre of this agglutination factor in bovine serum is almost constantly 1/16, and this would not permit of more than 200 c.cm. being administered rapidly with safety to any human being. Furthermore, haemolysis of the human red cells is very definite after a period of one hour. These tests bear out the statement of Kremen *et al.* as to its unsuitability for human administration.

### Removal of the Globulins

As most of the antibodies are known to be attached to the globulins, removal of this fraction might leave a solution of albumin which could safely be given to man. To this end we took samples of bovine serum and precipitated the globulin fraction by half saturation with sodium sulphate. The resulting filtrate was then dialysed in cellophane cylinders against water, leaving behind a solution of albumin. This albumin was passed through a Seitz filter and collected in sterile bottles. A test of the solution showed that there was no agglutination of human red cells. The pH was 7.8.

This albumin solution was administered slowly to two volunteer patients suffering from advanced carcinoma of the

While little is known of the nature of the immunological processes involved, it is reasonable to suppose that they will be aided by the maintenance of a high standard of general health, and in practice measures to this end do appear to be important. In our experience ambulant patients or those treated in their own quarters did not regain a feeling of well-being as quickly as those kept in hospital for an adequate period, and they had a greater tendency to early relapse, though the same course of drugs may have been administered in each case. We had an impression that the same applied to patients receiving an unnecessarily large dosage of drugs. Whatever drugs are given patients should, except in an emergency, be treated in hospital and should remain there for a minimum of 12 to 14 days. It is false economy to treat patients otherwise or to cut short their convalescence.

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These must always be regarded as medical emergencies, and should be treated promptly and, in the initial stages, by injection. We do not propose to enter into the controversy as to the best route for the injection of quinine. We used both intravenous and intramuscular injections on occasion without encountering ill effect. In a patient who is conscious and can take quinine by mouth and absorb it (as shown by the Tanret test in the urine) nothing was gained, in our experience, by giving more than two or at most three parenteral injections. In comatose patients or those unable to take or absorb drugs given by mouth, parenteral injections must be continued till the symptoms are controlled. Intravenous glucose and saline may be necessary to prevent dehydration. In a few cases we tried reconstituted plasma as suggested by Fawcitt and considered the results promising. In patients with cerebral malaria who failed to respond to other measures therapeutic lumbar puncture seemed to be of value.

#### Suppressive Treatment between Attacks

The taking of a small dose of so-called "prophylactic" quinine has been customary among Europeans on the West Coast for at least a century, and is strongly recommended by most local practitioners of experience. This measure is undoubtedly of some value, and is considered essential for troops under active-service conditions. In practice the results are not quite according to theory, and a varying degree of individual susceptibility appears to be of importance; for some individuals can go for long periods with no suppressive drugs and have little or no malaria, while others have repeated attacks in spite of them.

In dealing with troops under active-service conditions exceptions cannot be made, and the taking of a suppressive drug on parade and under the supervision of an officer is enforced. It is likely that mepacrine will replace quinine for this purpose in troops in West Africa, and according to Hill (1942a, 1942b) doses of 0.1 g. daily can be taken with good effect and without the appearance of toxic manifestations. It is important that persons leaving malarious districts of this type should be instructed either to continue with their normal dose of suppressive drug for at least two months after they have left the area, or to continue this dose for two weeks and then take mepacrine 0.1 g. thrice daily for five or six days.

#### Summary

846 unselected cases of malaria in British troops in West Africa, every one confirmed by the finding of parasites and presumably almost all subtertian in type, were divided according to the principal clinical feature of the attack into febrile, gastric, diarrhoeic, dysenteric, respiratory, myalgic, and cerebral types.

While its apparent mildness may occasionally prove the disease's most subtle danger, under the conditions stated, which included compulsory personal antimalarial precautions and taking of suppressive drugs, the prognosis in ordinary cases was excellent, while pernicious attacks and complications were very rare. Only 2 patients died, both from blackwater fever, and 14 were invalided home.

After various modifications in treatment the routine use of pamaquin was abandoned. The most generally useful course of drugs in uncomplicated cases was found to be quinine gr. 10 i.d.s. by mouth for two or three days, and mepacrine 0.1 g. t.d.s. for six days, the two drugs being with advantage "overlapped" for 24 hours. The patient's usual dose of a suppressive drug was resumed as soon as the course was finished, and an adequate period of convalescence was regarded as of the greatest importance.

Our thanks are due to Col. O. J. O'Hanlon, officer commanding a military hospital, for permission to publish this article; to Col. John McFadden and A. McKie Reid for according us facilities for the investigations; to Major I. B. Morris for most of the pathological investigations; to Major J. W. Howe for helpful criticism; and to Dr. A. M. Gillespie, Senior Medical Specialist, Accra, for advice on many occasions.

## REFERENCES

- Anderson, W. L., and Bradshaw, D. B. (1943). *British Medical Journal*, 1, 508.  
 Boyle, J. (1831). *A Practical Medical-Historical Account of the Western Coast of Africa*, p. 127. London.  
 Coggeshall, L. T. (1943). *Medicine*, 22, 87.  
 Falcener, A. W., and Anderson, A. G. (1917). *Lancet*, 1, 607.  
 Fawcett, J. D. (1940). *Lond. Hyg. Gaz.*, 44, 9.  
 — and Walters, A. H. (1941). *British Medical Journal*, 1, 14.  
 Hill, T. R. (1942a). *Trans. roy. Soc. trop. Med. Hyg.*, 36, 70.  
 — (1942b). *Ibid.*, 36, 75.  
 Howie, J. W., and Murray-Lyon, R. M. (1943). *Lancet*, 2, 317.  
 Hughes, W. (1942). *Trans. roy. Soc. trop. Med. Hyg.*, 36, 60.  
 — and Murgatroyd, F. (1943). *Lancet*, 1, 699.  
 Mann, W. N., and Smith, S. (1943). *Trans. roy. Soc. trop. Med. Hyg.*, 37, 151.  
 Manson-Bahr, P. (1920). *Lancet*, 1, 79.  
 — (1922). *In History of the Great War. Medical Services: Diseases of the War*, 1, p. 276. London.  
 Murray, J. E., and Shute, P. G. (1942). *Lancet*, 2, 365.  
 Sinton, J. A., and Bird, W. (1928). *Indian J. med. Res.*, 16, 159.  
 — Smith, S., and Foulger, D. (1930). *Ibid.*, 17, 793.  
 Wingfield, A. (1943). *British Medical Journal*, 1, 150.

## DESPECIATED BOVINE SERUM (D.B.S.): A SUBSTITUTE FOR HUMAN PLASMA

BY

F. RONALD EDWARDS, M.D., Ch.M., F.R.C.S.

Assistant to the Professor of Surgery, University of Liverpool

(From the Department of Surgery, University of Liverpool)

The use of plasma in surgical treatment is increasing rapidly, and further studies of the condition of hypoalbuminaemia and its relation to post-traumatic and post-suppurative cachectic states and to delayed wound-healing envisage a still greater demand for plasma protein therapy. The panels of donors and blood banks organized throughout the country have hitherto provided a convenient supply of a protein solution, but the investigation of an alternative source is indicated in view of the future need for this material.

Any plasma substitute must have the following characteristics: (a) it should be retained in the circulation and eventually be metabolized; (b) it should exert an osmotic pressure equivalent to that of plasma; (c) it should be non-toxic, free from antibodies, and non-antigenic. An attempt to produce such a material was made by Bayliss in 1916, when he introduced 6% gum-acacia in saline as a substitute for blood in the treatment of shock (Bayliss, 1917). This material had a very considerable efficiency, but it was only partially metabolized. Much of it remained permanently in the tissues, and many unpleasant sequelae occurred (Hanzlik and Karsner, 1920; Maytum and Magath, 1932; Yuile and Knutti, 1939; Andersch and Gibson, 1934).

Other organic substances suggested have been isinglass (Taylor and Waters, 1941), pectin (Hartman *et al.*, 1941), gelatin (Gordon *et al.*, 1942), and methyl cellulose (Hueper, Martin, and Thompson, 1942); but they must be absolutely pure, and in the case of the first three this standard is very difficult to obtain. Furthermore, the effective metabolism of such foreign material is very much in doubt. More recently peristom (polyvinyl pyrrolidone) has been put forward in Germany (Hecht and Weese, 1943); it has a very high osmotic action, and the claim is made that it will remain in the circulation for two days and be excreted in 3 to 4 weeks. All these substances may have some beneficial effect in maintaining blood volume in shock and haemorrhage, but will have little or no value in restoring loss of blood protein.

The substance most nearly approaching human plasma protein in character, and one which is available in quantity, is animal plasma protein. Unlimited quantities may be obtained in the abattoirs in the form of animal serum. A comparison of the protein constituents of human blood with those of the blood of the animals of which practical use may be made is shown in the following table (Howe, 1925):

	Human	Cow	Horse	Sheep
Total protein, g. %	7.49	7.43	6.10	5.74
Fibrinogen "	0.30	0.72	0.34	0.36
Globulin "	2.73	3.50	2.49	2.31
Albumin "	4.45	3.21	3.27	3.17
Albumin/globulin ratio	62.0/38.0	47.8/52.2	56.6/43.4	57.1/42.9

In total protein, bovine blood most nearly approaches human blood, but there is a much higher percentage of fibrinogen, which, however, is eliminated in the preparation of the serum. Howe's figure for the total protein of bovine blood refers to elderly animals, bullocks usually having a much higher content than this (see below). The albumin/globulin ratio is lower, too, in bovine blood, which might result in a lower osmotic pressure than with human serum, as the albumin fraction, having a smaller molecule, exerts the greater pressure. As bovine serum is obtainable in the largest quantity, however, this material has been utilized in the following investigation.

### Administration of Animal Sera

The infusion of animal sera of full protein content has up to the present been generally unsatisfactory, owing to the high percentage of unfavourable reactions. Kremen and his co-workers (1942) recently gave crude bovine serum an extensive clinical trial in 120 cases, and have declared it unsuitable for general use for the following four reasons: (1) all recipients must be tested by an intradermal dose, positive reactors (approximately 50%) to which do not take the serum well; (2) approximately 60% of the recipients have an immediate reaction after infusion of less than one pint; (3) serum sickness developed in 60% of those cases to which it was possible to administer any quantity of the serum; (4) the rate of administration was so slow as to be practically useless in shock. These authors attempted, furthermore, to absorb the agglutinins on to washed human red cells by mixing these with the serum; but this was only partially successful, and there was a tendency to haemolysis of the human red cells. The incidence of immediate reactions decreased somewhat, but serum sickness was just as prevalent.

### Characteristics of Crude Bovine Serum

Crude bovine serum is orange in colour and of a slightly higher viscosity than human serum. We have found the total protein content to vary between 7.5 and 9.5 g.%, the higher figure being obtained in bullocks (Folin and Cioclateau's colorimetric method). The values for sugar, chlorides, non-protein nitrogen, and potassium were approximately the same as for human serum. *In vitro* tests showed that when bovine serum was mixed with 50 different samples of human red cells of all groups agglutination occurred rapidly. The titre of this agglutination factor in bovine serum is almost constantly 1/16, and this would not permit of more than 200 c.c.m. being administered rapidly with safety to any human being. Furthermore, haemolysis of the human red cells is very definite after a period of one hour. These tests bear out the statement of Kremen *et al.* as to its unsuitability for human administration.

### Removal of the Globulins

As most of the antibodies are known to be attached to the globulins, removal of this fraction might leave a solution of albumin which could safely be given to man. To this end we took samples of bovine serum and precipitated the globulin fraction by half saturation with sodium sulphate. The resulting filtrate was then dialysed in cellophane cylinders against water, leaving behind a solution of albumin. This albumin was passed through a Seitz filter and collected in sterile bottles. A test of the solution showed that there was no agglutination of human red cells. The pH was 7.8.

This albumin solution was administered slowly to two volunteer patients suffering from advanced carcinoma of the

The solution is easily prepared, is available in enormous quantities, is completely stable, and can be stored at room temperature. It may be administered very rapidly and in large amounts; and no patient seems to have been adversely affected by its introduction.

More detailed haematological and biochemical studies of the effect of its administration in the state of shock, hypoproteinaemia, and protein deprivation and loss are being undertaken, and final judgment must await these results. Despeciated bovine serum would, however, appear to accord with the three precepts given at the beginning as being necessary for a plasma substitute, and as such may have a useful place in the treatment of conditions in which human plasma protein has been of value.

#### Summary

Substitutes for human plasma hitherto prepared have not fulfilled the three criteria: (a) retention in the circulation and eventual metabolism; (b) exertion of an equivalent osmotic pressure; and (c) non-toxicity, non-antigenicity, and freedom from antibodies.

Bovine serum can be made safe for man by destroying the antibodies by heating to 72° C., while rendering the proteins uncoagulable with the addition of 0.2% of formalin and ammonia. Material so prepared appears to accord with the above precepts.

Clinical trial in 26 cases shows that it can be administered rapidly and in large amounts to man with safety.

My grateful thanks for much practical help and advice are due to Prof. O. Herbert Williams, Prof. T. B. Davie, Prof. H. J. Channon, and the late Prof. J. F. Craig. To Prof. T. B. Davie I am also deeply indebted for placing the facilities of the Regional Transfusion Laboratories at my disposal. Very valuable technical assistance has been given to me by Herbert Gutfreund, B.Sc., who also prepared the solutions of bovine albumin. The ultracentrifuge runs were kindly undertaken by Dr. Ogston of Cambridge. The preparation of D.B.S. has been continuously in the hands of Mr. Harold Nevin, technical assistant in the department of surgery. Finally I am indebted to Dr. A. J. McCall, pathologist to the North Staffordshire Royal Infirmary, Stoke-on-Trent, for the "idea" of adding formalin and ammonia to serum to prevent coagulation.

#### REFERENCES

- Andersch, M., and Gibson, R. B. (1934). *J. Pharmacol.*, **52**, 390.  
 Bayliss, W. M. (1917). *Proc. roy. Soc. B*, **89**, 380.  
 Cohn, E. J. (1941). *Chem. Rev.*, **28**, 395.  
 — et al. (1942). In *Blood Substitutes and Blood Transfusion*, p. 173, ed. by Stuart Mudd and William Thalhimer. Charles C. Thomas, Springfield, Ill.  
 Davis, H. A., Eaton, A. G., and Williamson, J. (1942). *Proc. Soc. exp. Biol. N.Y.*, **49**, 96.  
 Edwards, F. Ronald (1943a). *Proc. roy. Soc. Med.*, **36**, 337.  
 — (1943b). *Bull. War Med.*, **4**, 24.  
 Gordon, H., Hoge, L. J., and Lawson, H. (1942). *Amer. J. med. Sci.*, **204**, 4.  
 Hanzlik, P. J., and Karsner, H. T. (1920). *J. Pharmacol.*, **14**, 379.  
 Hartman, F. W., Schelling, V., Harkins, H. N., and Brush, B. (1941). *Ann Surg.*, **114**, 212.  
 Hecht and Weese (1943). *Munch. med. Wschr.*, **90**, 11. Quoted by *Bull. War Med.*, M.R.C., 1943, 3, 511.  
 Howe, P. E. (1925). *Physiol. Rev.*, **5**, 439.  
 Hueper, W. C., Martin, G. J., and Thompson, M. R. (1942). *Amer. J. Surg.*, **56**, 629.  
 Jacobs, J. L., and Sommers, S. C. (1939). *J. Immunol.*, **36**, 531.  
 Kremen, A. J., Hall, H., Koschnitzke, H. K., Stevens, B., and Wangenstein, O. H. (1942). *Surgery*, **11**, 333.  
 Maytum, C. K., and Magath, T. B. (1932). *J. Amer. med. Ass.*, **89**, 2251.  
 Taylor, N. B., and Waters, E. T. (1941). *Canad. med. Ass. J.*, **44**, 547.  
 Yule, C. L., and Knutli, R. E. (1939). *J. exp. Med.*, **70**, 605.

## TREATMENT OF ANAEMIA IN SCHOOL-CHILDREN WITH IRON AND ASCORBIC ACID

BY

L. S. P. DAVIDSON, M.D., F.R.C.P.Ed.&Lond.

AND

G. M. M. DONALDSON, M.B., Ch.B.

In a previous survey of the haemoglobin levels of a cross-section of the population in Edinburgh (Davidson *et al.*, 1942) subnormal haemoglobin values were found in approximately 40% of children from municipal schools as compared with only 4.5% of children examined at private schools. Accordingly a therapeutic test was undertaken in order to evaluate the effect of adding supplements of iron and ascorbic acid to the diet of the municipal-school children. The results of this experiment have been submitted to Dr. A. Bradford Hill for statistical analysis, and the statement that a significant rise in the mean haemoglobin values has occurred in any of the experiments outlined below is based on that analysis. In each experiment the initial haemoglobin levels of the control

and experimental groups were not significantly different. The tests were carried out in three municipal schools on children from 5 to 12 years of age.

#### School I

The children in both the control and the experimental groups were unselected, but were divided into three groups according to whether they took school or home midday meals. Group A consisted of children who went home for a midday meal; Group B included those who took school dinners, for which they paid; while Group C included those children who had free school dinners. The children in the experimental groups were given 3 gr. of ferrous sulphate in tablet form daily for 5 days a week. Haemoglobin estimations were made at the outset of the experiment and again after three months of treatment. The results of the experiment are shown in the accompanying Table.

Table showing Mean Hb % in Control and Experimental Groups

	Total	Treatment Received	1st Examination	2nd Examination	3rd Examination
School I:					
Group A {	77	Ferrous sulphate 3 gr. daily	85.1	84.6	
Control	85		85.3	87.0	
" B {	32	" "	77.0	80.1	
Control	44		80.3	85.9	
" C {	41	" "	82.2	82.6	
Control	45		80.7	86.3	
School II:					
{	57	Asc. acid 25 mg. daily	81.7	80.8	
Control	56		82.4	82.0	
{	57	Asc. acid 25 mg. daily + ferrous sulph. gr. 3 daily	82.4	83.8	
Expt. II					
School III:					
Control	27	Asc. acid 25 mg. daily + ferrous sulph. gr. 6 daily	78.0	81.2	83.3
Expt.	27		77.8	87.3	93.5

#### Conclusions

(a) *Control Groups*.—There was no significant rise in the mean haemoglobin levels at the second examination.

(b) *Experimental Groups*.—In all three groups the mean haemoglobin levels at the second examination after three months of treatment were significantly higher than the corresponding figures for the control groups. In Groups B and C there was also a significant rise in the haemoglobin levels at the second examination as compared with the original haemoglobin values. In Group A, although there was a rise in the haemoglobin values, it was not statistically significant.

(c) An analysis of the haemoglobin figures of those children whose initial haemoglobin level was less than 80% showed that of 59 such children in the control series 31 (52.5%) still had haemoglobin figures of less than 80% at the second examination; while of 71 receiving iron therapy, only 24 (33.8%) still had haemoglobin figures of less than 80% at the second examination. This improvement in the treated group is statistically significant.

#### School II

(a) *Control Group*: total, 57 unselected children. (b) *Experimental Group A*: total, 56 unselected children; treated with 25 mg. of ascorbic acid daily for 5 days a week. (c) *Experimental Group B*: total, 57 unselected children; treated with 25 mg. of ascorbic acid daily and 3 gr. of ferrous sulphate daily for 5 days a week. Haemoglobin estimations were made at the outset of the experiment and again after three months of treatment.

#### Conclusions

(a) *Control Group*.—There was no significant rise in the haemoglobin values when the estimations were repeated at the end of three months.

(b) *Experimental Group A*.—There was no significant rise in haemoglobin levels after three months of treatment with ascorbic acid as compared with the initial haemoglobin values or with the control group.

(c) *Experimental Group B*.—There was a significant rise in the haemoglobin levels of the children on iron and ascorbic acid after three months of treatment as compared with the



control group, but the increase over their own initial haemoglobin values was not significant.

(d) An analysis of the haemoglobin figures of those children whose initial haemoglobin level was less than 80% showed that out of 26 in the control series 15 (57.7%) still had haemoglobin figures of less than 80% at the second examination; of those receiving ascorbic acid alone, 19 had haemoglobin levels below 80% at the first examination, and at the second examination 13 (68.4%) were still below 80%; while of those receiving iron and ascorbic acid 19 were below 80% at the first examination, but only 4 (21.1%) were below 80% at the second examination. The improvement noted in this last group is statistically significant.

#### School III

Only children whose original haemoglobin level was 80% or less were included in this experiment. (a) Control group, total 27. (b) Experimental group, total 27.

The children in the experimental group were given 25 mg. of ascorbic acid daily and 6 gr. of ferrous sulphate in tablet form daily for 5 days a week. It should be noted that the dosage of iron was double that given in Schools I and II, and the children were selected because clinical anaemia was present. Treatment was given for six months. Haemoglobin estimations were made at the outset of treatment and repeated at intervals of three and six months.

#### Conclusions

(a) *Control Group.*—A significant rise in haemoglobin levels was found at the second and third examinations as compared with the levels found at the first examination.

(b) *Experimental Group.*—This series also showed a significant rise in haemoglobin levels at the second and third examinations. The mean levels in this treated group were, however, significantly greater than those found in the control group at the second and third examinations.

#### Discussion

Investigations into the Hb levels of large numbers of persons in different areas of Great Britain, including Aberdeen (Davidson *et al.*, 1935) and Edinburgh (Davidson *et al.*, 1942), have clearly demonstrated the frequency with which anaemia occurs in infants, school-children, and women, both pregnant and non-pregnant. The anaemia is almost universally of the hypochromic type, which responds excellently to iron therapy. It leads to a feeling of fatigue and exhaustion, to a loss of appetite, and to a reduction in efficiency. In the case of the infants it has been shown to be associated with an increased liability to infection. The family doctor should constantly be on the watch for the development of anaemia in his patients. The improvement in their general well-being which will rapidly result from the administration of the ferrous salts of iron will amply reward him for the time spent on making the necessary examinations. For the prevention of anaemia, reliance should be placed primarily on securing an adequate intake of iron by instructing the patient to eat sufficient quantities of the foodstuffs which are particularly rich in the mineral. By so doing the intake of other important factors connected with haematopoiesis—e.g., protein and vitamins B and C—will be coincidentally improved. In this connexion we wish to draw attention to the value of national wheatmeal bread made of 85% extraction flour. Its content of iron is 0.7 mg. per oz., compared with 0.3 mg. per oz. for white bread made from 70% extraction flour. On an average intake of 6 oz. of bread daily an addition of more than 2 mg. of iron daily is consumed. Investigations which will be published shortly suggest that this increment during the past eighteen months has already made a significant contribution to the reduction of anaemia in school-children. Nevertheless, under wartime conditions it may on occasion be necessary to supplement the diet with medicinal iron.

The investigations reported in this paper clearly indicate that the administration of iron in doses of approximately one-third of that usually prescribed for curative treatment can significantly improve the haemoglobin levels of school-children. The increases shown in the Table are admittedly small. It might accordingly be asked whether any significant improvement in health could be expected to result therefrom. It should be pointed out, however, that the figures given represent mean

values. In the municipal-school children in Edinburgh the average haemoglobin figure was found to be 80%. Accordingly approximately half of the children had a haemoglobin level above this figure and half below it. It would be unreasonable to expect such small doses of iron to affect materially haemoglobin levels of normal or only slightly subnormal ranges. A study of individual cases showed this to be the case. It should be noted incidentally that when two tablets were given daily, as in School III, the mean haemoglobin was brought up to 93%. In the case of children whose haemoglobin was below 80%, and particularly when they were in the neighbourhood of 70%, a rise of 10 to 15% regularly followed the administration of one tablet of fersolate daily. It was due to these increments that the mean haemoglobin level was raised. Few would question the advantages to the health of school-children of such an increment.

It should be noted that the experiments recorded in this communication were essentially prophylactic in nature, and it must be clearly understood that in the treatment of individual cases of anaemia much larger doses of iron should be given.

Our knowledge of the aetiology, incidence, and treatment of iron-deficiency anaemia is now so complete that the medical profession must shoulder the responsibility if the necessary measures for its control are not widely adopted.

#### Summary

Experiments conducted over periods of three to six months indicate that a supplement of iron, even in such small amounts as 3 gr. of ferrous sulphate once daily for 5 days a week, can produce a significant rise in the haemoglobin levels of municipal-school children.

This suggests that the hypochromic anaemia of these children is mainly conditioned by an insufficiency of iron in the diet.

A supplement of 25 mg. of ascorbic acid daily had no effect in raising the haemoglobin levels.

We wish to express our thanks to Dr. Bradford Hill for his statistical help, and to Messrs. Glaxo Laboratories Ltd. and Roche Products Ltd. for their generosity in supplying free the supplements of iron and ascorbic acid respectively; and also to the Medical Officer of Health for Edinburgh and the staffs of the municipal schools, whose assistance was much appreciated.

#### REFERENCES

- Davidson, L. S. P., Donaldson, G. M. M., Lindsay, S. T., and McSorley, J. G. (1943). *British Medical Journal*, 2, 95.  
Fullerton, H. W., and Campbell, R. M. (1935). *Ibid.*, 2, 195.

## THE INFLUENCE OF SUPPLEMENTS OF VITAMINS A, B<sub>1</sub>, B<sub>2</sub>, C, AND D ON GROWTH, HEALTH, AND PHYSICAL FITNESS

BY  
E. R. BRANSBY J. W. HUNTER, M.D.  
H. E. MAGEE, M.B. E. H. M. MILLIGAN, M.D.  
AND  
T. S. RODGERS, M.D.

This is a summary of a vitamin feeding test carried out in 1941-2 on approximately 1,400 school-children and adults. A full report of the test has been prepared, but it is too lengthy for publication.

Towards the end of 1940 the Ministry of Health accepted a gift of multi-vitamin capsules from a group of United States physicians to carry out a feeding test on suitable groups of people. The time was opportune, and the capsules were employed as test material to ascertain whether a supplement of synthetic vitamins to the ordinary diet would improve growth, health, and physical efficiency. Each capsule contained:

Vitamin A ..	4,000 i.u.	Ascorbic acid ..	1,000 i.u.
Vitamin B <sub>1</sub> ..	333 i.u.	Nicotinamide ..	20 mg.
Riboflavin ..	2 mg.	Vitamin D ..	600 i.u.

Three of the five tests carried out were done on school-children and two on factory workers. Four times during the tests the vitamin content of the capsules was checked and found up to specification by the Medical Research Council. The school tests were performed on elementary-school children in Ipswich, Glossop, and London. The number of children who completed the test was 1,242: Ipswich, 425 boys and girls aged 5 to 13; Glossop, 370 boys aged 9 to 13; London, 447 boys



aged 9 to 14. Of the London children 123 were boys aged 9 to 14 living in a camp school.

The tests began in Nov./Dec., 1941, and ended in July/Aug., 1942. The school-children were examined before, during, and after the period of feeding. They were divided at random into two equal groups according to school, age, and sex; one group received a vitamin capsule every school day, and the other a capsule containing a similar quantity of arachis oil, which is practically devoid of vitamins. Records were kept of all illnesses, of their nature and duration. The medical examination included examination of the teeth and gums by dentists—in London by T. S. Rodgers.

The factory tests were conducted at the zinc-smelting works at A and L, where the labour is extremely strenuous and exhausting. The men work in gangs of five or six, and the average output of zinc for each gang is weighed daily. In factory A 12, and in factory L 24, gangs of workers were divided at random into a vitamin and a control group. Each man received an appropriate capsule six days a week. The naked weight was taken monthly before the men began work. Haemoglobin and blood pressure were also measured at regular intervals, and the output of zinc and all absences due to illness were recorded.

The findings for the children were similar in all four places. During the period of observation the vitamins had no statistically significant effect on the rate of growth, nutritional status, muscular strength, condition of the teeth and gums, or absence from school on account of illness. Muscular strength was measured in London and Glossop by a dynamometer like that described by Hill, Magee, and Major (*Lancet*, 1937, 2, 441); it was not done in Ipswich. In Glossop alone a special test of endurance by hanging on a bar was done. Both the controls and the vitamin children improved in endurance, and the improvement shown by the vitamin children was greater than that shown by the controls. In view of the relatively small number of Glossop children tested, we feel that this particular finding should be strictly limited in its application to that group of children. Similar findings would have to be obtained in other areas before any wider application of the Glossop results could be regarded as justifiable. Feeding tests with this object were started on several thousand children three months after the conclusion of the above tests, and are still in progress.

In the factory tests on 214 adult men, the results showed that the vitamin capsules had no significant effects on weight, haemoglobin, blood pressure, absence from illness, or output of material. The conditions of the test in the factories, however, were such that only relatively large differences in output would have been revealed.

Many people assisted us in conducting these feeding tests and analysing the results, but lack of space forbids individual acknowledgment of their help. A mass expression of thanks to all who co-operated is all we can make in this summary.

## UMBILICAL HERNIA IN CHILDREN WITH SPECIAL REFERENCE TO INJECTION TREATMENT

BY

M. J. BENNETT-JONES, Ch.M., F.R.C.S.

Honorary Surgeon, Bootle General Hospital and St. Helens Hospital; Visiting Surgeon, Whiston County Hospital

Umbilical hernia is classified into three types—congenital, infantile, and adult. There is no disagreement as to the treatment of the extremely rare congenital type, or exomphalos: all are agreed that it is only possible to save the infant from peritonitis by operating within a short period after birth. I have successfully operated on an infant within four hours of birth for an extensive exomphalos containing much large and small intestine: the defect in the abdominal wall was closed by the Mayo method, and it was surprising how the scar later contracted down and almost resembled a normal umbilical cicatrix.

The infantile and adult types are both of acquired origin; but they are regarded as being quite separate diseases. The general impression is that umbilical hernia rarely occurs in adolescence and early adult life. It is true that surgery is seldom requested for umbilical herniae at this period of life, because, if present, they are small and do not bother the

patient much. Few mothers will fail to seek medical attention for a large umbilical hernia in a child. The adult patient one has to deal with are more commonly females than males, and the preponderance of females appears proportional to the greater incidence of adiposity in the female sex. Although the patients are over 40 years of age they usually state that they know the hernia has been present many years; but its onset is always vague and insidious. It is therefore impossible to establish any clear relation between the presence of a umbilical hernia in childhood and one in later life.

### Clinical Features of Infantile Umbilical Hernia

The mother nearly always states that the hernia has dated from soon after birth, but occasionally a latent interval up to four months has been noticed. There is no history of any gross sepsis of the umbilical stump. The infant, either male or female, is often poorly developed, and is more likely to be suffering from rickets than the very rare condition of cretinism. It is important to keep in mind the possibility of increased intra-abdominal pressure due to ascites or intestinal obstruction, etc. The majority, however, have no obvious predisposing cause, but sometimes inguinal hernia is also present; adiposity apparently is not associated with infantile umbilical hernia. The infants are presented at a surgical out-patient department from 8 weeks old upwards, but the majority are about 18 months old when they arrive, having failed to respond to treatment by strapping.

### Treatment

Paterson and Gray (Barrington-Ward, 1937) found that out of 214 cases at the Hospital for Sick Children, Great Ormond Street, 101 disappeared without operation, but all writers say that the longer the hernia has been present and the larger the neck, the less likely will it be cured without operation. Few spontaneous cures occur after the age of 3 with support. As spontaneous cure with support occurs in nearly half the cases I thought injections would increase the proportion of and hasten cure in selected cases with small necks. My result seem to show that injections can cure umbilical hernia in such cases. The advantage of the treatment is that it may avoid operation and admission to hospital, and can therefore be advised for debilitated infants and children with small herniae. I think the main disadvantage is that the temperament of young children is rather unsuited to repeated injection if one is insufficient. There appears to be no risk of injecting into the peritoneal cavity.

Injection treatment of inguinal hernia was first practised by George Heaton (1877) of Boston, Mass., about a hundred years ago, but was later perfected by Ignatz Mayer of Detroit. Delisle Gray (1932), who advocated Mayer's technique, brought the method and the results before the medical profession in England. So far as I can ascertain from literature and hearsay evidence there have been few cases of umbilical hernia treated in this way. Burdick and Coley (1937), out of a total of 92 cases, treated only one umbilical hernia by injection, and the result of this was not stated. Wyss (1929), Larson (1934), and Quillin (1934) reported favourably on the result of injecting umbilical herniae, but they were all mainly concerned with adult inguinal hernia. Bratrud (1937) illustrated his technique of injections for umbilical hernia, and stated that by this method they were more favourable than even in indirect inguinal hernia. Personally, I have not yet tried injection for inguinal hernia because the many attendances for injection at an out-patient department would entail as much lost work as with operative treatment, and if the patient was not cured at the end of the time both patient and employer would be dissatisfied. With regard to inguinal hernia in children, the operative treatment is so safe, with recurrence and sepsis almost unknown, that I have not yet been tempted to try injection treatment. There is no doubt that even inguinal hernia can sometimes be cured by a truss in childhood—e.g. the famous case of Sir Astley Cooper (Murray, 1910), which was verified at his necropsy, when only a minute sinus can be found extending to the tunica vaginalis. In spite of this operative treatment is indicated because of the rarity of spontaneous cure.

It is the accepted view that umbilical hernia in children is nearly always curable with a support, but the cases seen

in hospital do not seem to respond to strapping. The cases of umbilical hernia I selected for injection had necks the smallest diameter of which was one-third of an inch or less. Most of the cases had been sent to me because strapping had failed.

#### Technique of Injection Treatment

An anaesthetic is not essential for young infants: a little ethyl chloride anaesthesia, however, is very helpful, because voluntary movements are controlled, but the sac still remains distended, so that it can be avoided. I have used up to 4.5 c.cm. of 5% phenol in almond oil at one injection. The solution is injected into the subcutaneous tissue as near the neck as possible without risk of puncture of the peritoneum. At a subsequent injection, if this is required, it is much harder to inject the solution. After injection it is essential to keep the hernia reduced. A small round pad of gauze is held in position by elastoplast applied right round the body like a belt at the level of the umbilicus. This support should be continued after the injections have ceased because the scar tissue produced by the sclerosing fluid becomes more strain-resistant as time progresses. Animal experiments (Crohn, 1937) have shown that the phenol solution produces tiny areas of necrosis, which are later followed by more intense fibrous reaction than that seen when other solutions have been tried.

I would like to emphasize the method of applying elastoplast as a complete belt. Beadnell (1942) has suggested applying elastoplast to one half of the abdomen as far as the midline while the nurse pushes the other half of the rectus muscle towards the middle. Beadnell admits that his method produces a fold of skin in the midline, so there will be no effective antero-posterior support and very little pull on the two rectus muscles when the child cries or strains. The belt method of application keeps the hernia effectively reduced without any skin-chafing, and it will give much more support to the hernia owing to fixation from the lumbar spine. Mothers of babies with umbilical hernia nearly always state that they have noticed that the baby has cried less than before, and the belt method has certainly not reduced the baby's appetite or increased its liability to vomit. I strongly recommend this method of support, even for the youngest babies, as soon as umbilical hernia is noticed. The ordinary binder slips either up or down and it has to be removed daily for bathing, so the hernia is not kept permanently reduced.

#### Results of Injection Treatment

With ages ranging between nearly 3 months and 5 years, 42 out of a total of 62 cases of infantile umbilical hernia were selected for injection treatment and 63 injections were given. 26 cases needed only one injection; 11 cases had two injections, but two of these were submitted to operation later because the hernia showed insufficient diminution in size; 4 cases had three injections, and only 1 case had four injections, but this resulted in a cure. Out of the 42 cases selected for his treatment 31 were apparently completely cured when seen later, excluding the 2 cases cured by operation after unsuccessful injections; 2 cases were untraced, but it was not certain that the remaining 7 were finally cured, although when last seen they were responding well and there was very little umbilical bulge.

#### Subcutaneous Ligature

This minor operative procedure is recommended by Fraser (1926) for small umbilical herniae, and especially if they occur in slightly debilitated children who might not stand the radical procedure. The same author states that he has had no recurrence in hundreds of cases. Others, including myself, have not found this method so certain, because there has been a recurrence after an interval. It is probable that I would have found it more successful if I had combined subcutaneous ligature with a post-operative belt support.

#### Radical Cure

Most writers state that the radical method is the only certain way of curing umbilical hernia if the patient is over 3. It is required, however, for large herniae below that age. Barrington-Ward (1937) does not advise the Mayo type of repair, because here is no wide separation of the fascia, and yet he states that the recti are separated. It is curious that I cannot find any textbook which mentions that the hole in the fascia is

more often elliptical, with the long axis transverse: in fact, it can often be described as a transverse slit. Surely this shows that the Mayo type of closure of the fascia is better, just as it has proved better in adults. In children it is unnecessary to excise the umbilicus with an elliptical area of skin as in the Mayo operation for adults, because the hernia is reducible.

After opening the sac at its neck it is often possible to sew up the peritoneum separately. The aponeurotic opening is then closed by mattress sutures with overlap. The most difficult part of the operation is dissecting the fundus of the sac off the deep aspect of the umbilicus without buttonholing it or leaving a portion of the sac behind. My impression is that it is better to buttonhole the skin than to leave any endothelial lining, which predisposes to haematoma formation and sepsis in spite of drainage. Recently I have not drained the wound but have applied elastoplast as a belt after the operation. This procedure obliterates any dead space, and appears to have reduced the incidence of slight wound sepsis. Because of the danger of collapse of the lung Fraser does not recommend this operation before the age of 3. Apart from local sepsis, which delays convalescence, I have had no complications, although I will undertake operation in much younger patients if the hernia is large. I have performed the radical operation in 30 children, with two recurrent cases, during the same period as the cases that were selected for injection treatment.

#### Conclusions

Infantile umbilical hernia should be treated as early as possible with elastoplast applied as a belt with a small pad. After the age of 3 months the combination of injection and support will give a large percentage of cures even if strapping has failed in about two-thirds of the cases sent to the surgeon. Ambulatory treatment is desirable if possible in children, because of the frequent shortage of children's beds through infectious diseases and because of the risk of cross-infection. The injection treatment appears safe if done under short general anaesthesia.

#### REFERENCES

- Barrington-Ward, Sir L. (1937). *Abdominal Surgery of Children*, London.  
Beadnell, L. M. M. (1942). *British Medical Journal*, 1, 565.  
Bratrud, A. F. (1937). *Ann. Surg.*, 105, 324.  
Burdick, Carl G., and Coley, B. L. (1937). *Ibid.*, 108, 322.  
Crohn, N. M. (1937). *J. Amer. med. Ass.*, 108, 542.  
Fraser, John (1926). *Surgery of Childhood*, London.  
Gray, St. G. Delisle (1932). *British Medical Journal*, 2, 12.  
Heaton, George (1877). *The Cure of Rupture*, Boston.  
Larson, L. M. (1934). *Minnesota Med.*, 17, 703.  
Murray, R. W. (1910). *Hernia*, J. and A. Churchill, London.  
Quillin, L. J. (1934). *Int. J. Med. Surg.*, 47, 394.  
Wyss, F. (1929). *Schweiz. med. Wochs.*, 59, 85, 265.

## Medical Memoranda

### Dienoestrol for Menopausal Symptoms

The chemical formula and physical properties of dienioestrol (7 $\beta$ -di-p-hydroxyphenyl- $\Delta^4$ -hexadiene) were recorded by Dodds, Golberg, Lawson, and Robinson (1938), and Campbell, Dodds, Lawson, and Noble (1939). Zuckerman (unpublished communication), working on monkeys, found that dienioestrol when given by injection was much less potent than the naturally occurring oestrogens. Emmens (1938) found that when this compound was given to mice by mouth it had the greatest activity, relative to subcutaneous dose, of any oestrogen examined up to that time.

A clinical trial with dienioestrol was carried out by me (Barnes, 1942). The compound was used for the inhibition of lactation, and its effect for this purpose was compared with that of stilboestrol and hexoestrol. The results showed that when given by mouth dienioestrol is a potent oestrogenic substance, and inhibition of lactation was obtained with one-tenth of the dose required in the cases of stilboestrol and hexoestrol. It was clear that further clinical trials were desirable to establish the value of dienioestrol as an oestrogenic agent, and it was therefore decided to try its effect in relieving menopausal symptoms.

Hawkinson (1938) as a result of the study of 1,000 women who were undergoing a natural or artificially induced menopause found that 75% suffered from distressing symptoms, but that considerable relief could be given by the administration of naturally occurring oestrogens. This has been the experience of many workers, and it has been found that the synthetic oestrogens are equally successful in relieving the symptoms.

The results are not easy to evaluate, as the symptoms complained of are largely subjective. In the present series an attempt was made to follow the patients' progress by means of repeated vaginal smears, but, unfortunately, the records are incomplete in this respect, partly because the patients were erratic in their attendances at the clinic.

#### THE PRESENT INVESTIGATION

The clinical results obtained in this small series may be summarized as follows: A total of 13 patients received treatment with dienoestrol, all for menopausal flushing or senile vaginitis. Two must be discounted, as they attended the clinic only once and were not seen again.

Of the remaining 11 five were having a natural menopause; one had had a surgical menopause for endometriosis at 38 years; two had had hysterectomy (presumably without removal of both ovaries) 14 and 15 years ago respectively; three had had a radium menopause. The symptoms and signs were: seven had hot flushes only; two had signs and symptoms of senile vaginitis; two had both conditions.

The results of treatment with dienoestrol, using a dose of 0.1 mg. by mouth twice daily for one or more periods of four weeks, were as follows: Hot flushes relieved or cured, 7 cases; hot flushes slightly relieved, but responded better to stilboestrol (1 mg. twice daily), 1 case; hot flushes not relieved by dienoestrol but cured by stilboestrol (1 mg. twice daily), 1 case. Larger doses of dienoestrol would probably have been effective in these two cases. Senile vaginitis was relieved or cured in all the four patients treated for this condition.

As already mentioned, an effort was made to obtain objective evidence of the effects of treatment by means of serial vaginal smears. A smear was taken at each attendance—that is, every four weeks. In three patients the senile change was not sufficiently advanced before treatment was begun to say that there had been any change. In three others there was definite evidence of an oestrogenic effect, but in the remaining five the changes were too indefinite to warrant any conclusion.

All the patients were carefully questioned for toxic effects. None experienced nausea or vomiting. One patient had a slight vaginal haemorrhage. One other patient stated that the tablets "made her feel depressed," and she stopped taking them. Her hot flushes were subsequently relieved with stilboestrol.

#### CONCLUSIONS

It is unfortunate that it has not been possible to make these tests in a larger series of menopausal patients. The results obtained in this small group indicate, however, that dienoestrol is a safe and non-toxic oestrogen; and it is to be hoped that it will be possible for other workers to carry out more extensive trials.

This investigation was carried out in the Obstetric Unit, University College Hospital, on behalf of the Therapeutic Trials Committee of the Medical Research Council. Pressure of other duties has prevented my testing dienoestrol in a larger series of menopausal cases, and the present Memorandum is therefore published mainly as an encouragement to other workers to continue the tests.

I am indebted to Messrs. Boots Pure Drug Co. Ltd., British Drug Houses Ltd., and Glaxo Laboratories Ltd., for supplies of dienoestrol.

JOSEPHINE BARNES, D.M., F.R.C.S., M.R.C.O.G.,  
First Assistant, Obstetric Unit, University College Hospital.

#### REFERENCES

- Barnes, J. (1942). *British Medical Journal*, 1, 601.  
Campbell, N. R., Dodds, E. C., Lawson, W., and Noble, R. L. (1939). *Lancet*, 2, 312.  
Dodds, E. C., Golberg, L., Lawson, W., and Robinson, R. (1938). *Nature*, 141, 247.  
Emmens, C. W. (1938). *J. Physiol.*, 94, 22 P.  
Hawkinson, L. F. (1938). *J. Amer. med. Ass.*, 111, 390.

### "Inspiratory Borborygmi" as a Sign of Diaphragmatic Hernia

The diagnosis of diaphragmatic hernia has been made with increasing frequency in recent years, and it has come to be recognized as a not uncommon cause of obscure respiratory and abdominal symptoms. The symptoms are, however, in no way distinctive, and signs are in many cases indefinite or entirely lacking. As a result these patients are often wrongly diagnosed, and may even be subjected to operations without the true nature of the condition being recognized. Harrington (1938) found that in a series of 123 cases of diaphragmatic hernia an average of 3 previous erroneous clinical diagnoses had been made, and operations for gall-stones and gastric ulcer had frequently been carried out without relief. Diseases of the thorax, abdomen, or blood (hypochromic anaemia) may be simulated, and for this reason diaphragmatic hernia has been termed the "masquerader of the upper abdomen." In a case recently under my care the diagnosis was suggested by a sign which I have not seen previously described.

#### CASE RECORD

The patient, a woman of 74, was admitted to St. Nicholas Hospital complaining of cough and dyspnoea. She gave a history of migraine from puberty to the menopause, and strangulated inguinal hernia 10 years ago. Apart from this she was well till 5 years ago, when she began to have attacks of cough and breathlessness lasting 4 to 6 weeks at a time and recurring about once a year. An attack was preceded by a grunting noise in her stomach which she felt with each breath. She also suffers occasionally from pain in the left chest and back. For the last 8 months she has been increasingly short of breath on exertion, and if she eats a big meal she has abdominal pain and a sense of suffocation, and has to sit down and rest for a time. Several days before her admission to hospital she noticed the usual grunting noise in her stomach. This was followed by vomiting, and diarrhoea, and later by cough and dyspnoea. A few days after her admission the attack had passed off, but she complained of pain in her left chest passing through to the back. On examination she was found to be a fairly well nourished woman. She lay flat in bed and was in no obvious distress. A grunting, borborygmus-like sound synchronous with inspiration could be constantly heard coming from her abdomen during the examination. With the stethoscope this sound was found to be most readily audible over the left lower chest and epigastrium. It ceased when the patient held her breath or sat up. Physical examination, apart from some moist sounds at the bases of the lungs, was negative. The blood pressure was 160/85.

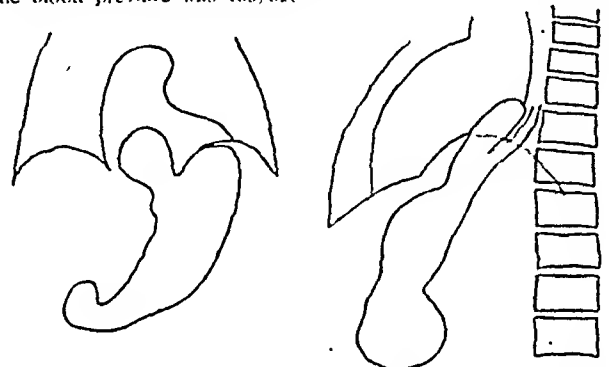


FIG. 1.—Antero-posterior view. Hernia can be seen lying behind lower part of heart shadow.

FIG. 2.—Lateral view. Hernia is seen to pass up into the posterior mediastinum in front of the oesophagus.

A barium meal revealed a shadow superimposed on the lower part of the heart shadow in the supine position (Fig. 1). In the erect position it was seen to empty during expiration and fill with barium from below at each inspiration. The hernia was observed to contain a portion of the cardiac end of the stomach and to be situated in the posterior mediastinum in front of the oesophagus (Fig. 2). It was therefore a para-oesophageal hiatus hernia, according to Akerlund's (1926) classification.

#### DISCUSSION

"Gurgling at the left base" has been mentioned in several accounts of the disease; but it is not diagnostic, as it is heard in many other conditions and in normal subjects by transmission of the sounds from the abdomen. Unless the gurgling sound is heard in the left side of the chest, is synchronous with respiration, and stops when the breath is held it is not diagnostic. The mechanism by which this sign is produced is simple. During inspiration the intra-abdominal pressure is increased. At the same time the pressure in the thorax becomes more negative. As a result gastric contents, both fluid and gaseous, are forced into the herniated portion of the stomach, so producing the gurgling sound. If in the upright position the fluid level in the stomach is below the opening into the herniated pouch, only gas will pass to and fro and so the sign will disappear, returning when the patient lies down again. I have not encountered this sign in any other disease.

**Addendum.**—A further case of diaphragmatic hernia in which this sign was present has since been encountered. This was also a hiatus hernia, but of the gastro-oesophageal type, the lower end of the oesophagus being pushed up through the hiatus as well as the fundus of the stomach. The sounds were best heard over the precordium, the patient lying on her left side.

I wish to thank Dr. Allen Daley, Medical Officer of Health to the London County Council, for permission to publish this paper; and Dr. F. J. Power, medical superintendent of St. Nicholas Hospital, for facilities granted.

J. STEWART LAWRENCE, M.D., M.R.C.P.,  
Physician to an Emergency Hospital.

#### REFERENCES

- Akerlund, A. (1926). *Acta radiol.*, 6, 3.  
Harrington, S. W. (1938). *J. Thoracic Surg.*, 1, 177.

## Reviews

### SURGERY OF REPAIR

*The Surgery of Repair: Injuries and Burns.* By Squadron Leader D. N. Matthews, R.A.F.M.R., M.D., M.Ch., F.R.C.S. (pp. 386; illustrated, 45s.) Oxford: Blackwell Scientific Publications Ltd. 1943.

It is a little difficult to know for whom this book is written. The student will find it an interesting and readable account of surgery of repair. The general surgeon will probably be interested in Part I and Part IV and leave the middle portion to the specialist, who in his turn will find this section somewhat inadequate.

Part I deals with the immediate treatment of injuries, and attempts to cover all the ground that has been written on so fully in the last few years. It discusses shock, crush injury, chemotherapy, anaesthesia, the surgery of wounds, nerve and tendon suture, abdominal and chest injuries. Shock is defined in two lines. Would that it were so simple! There is a noticeable tendency to make terse, dogmatic statements on debatable issues. A chapter on fractures of the mandible and fracture of the facial bones is valuable, but this could well be expanded. Part II describes late repair, including scar excision and the many varieties of skin transplantation. These are handled quite well, but without sufficient emphasis on the difficulties that lie in the path of the beginner. Nerve and tendon injuries get another chapter, but there is no warning of tourniquet paralysis, of the bad results of cut flexors, the weakness of catgut, the disappointments of annoplastin, the unreliability of the reaction of degeneration, or Tinel's sign. Part III is devoted to the repair of facial injuries. Operations are described for dealing with the nose, the lips, the eye, the cheek, etc. Each could do with a book to itself. Such have, indeed, been written. It is quite impossible to cover the field in a book of this size, and the reader should be warned that the repertoire is limited. Part IV is an adequate summary of the treatment of burns, but once again the field of late repair is inadequately covered.

The whole book gives one the impression of being too facile and unfinished. It is a pity that the author takes liberties with proper names, with anatomical nomenclature, and with the English language by using such words as "inrolling" and "pedieled" as verbs.

### BORDERLANDS OF PSYCHIATRY

*Borderlands of Psychiatry.* By Prof. Stanley Cobb. Harvard University Monograph in Medicine and Public Health, No. 4. (Pp. 166; illustrated, 52.50.) Massachusetts: Harvard University Press. 1943.

This is a very readable exposition, consisting of a series of lectures on the body-mind relationship, and especially the brain-mind relationship, in its bearing on disease. The chapter headings—Body and Mind; Parallel Evolution of Speech, Vision, and Intellect; Speech and Language Defects; The Function of the Frontal Areas of the Human Brain; Anatomical Basis of the Emotions; Consciousness; Concerning Fits; Psychoneurosis; Psychosomatics—indicate its scope. The author's general point of view is embodied in the following sentences: "My personal belief is that consciousness . . . is a function of nervous tissue in action, just as contraction is a function of muscle." "My guess just now is that consciousness will sooner or later be described in terms of electronic activity." His approach is therefore essentially neurophysiological, but his presentation is tolerant and well balanced.

Stanley Cobb's explanation of the *modus operandi* of leucotomy is that it depends essentially on cutting out the long-circuiting process which is made possible by the cortex, and that the extent of its effects depends on the number of fibres destroyed.

### A PRIMER ON FOOD FOR AFRICA

*Food. A Primer for Use in Schools, Colleges, Welfare Centres, etc., in Africa.* By Sir Robert McCarrison, M.D., F.R.C.P., and Desmond Fitzgerald Moore, M.R.C.S. (Pp. 116. 2s. 6d.) London: Macmillan and Co. 1943.

The children of Africa to whom this book is dedicated may understand much of what is written in it without supplementary explanation from their teachers, but it will be slow going and dull without discussions and experiments, for it is concisely written and every sentence is a bald statement of fact. Different "lessons" deal with the various components

of food—namely, proteins, fats, carbohydrates, minerals, and each of the vitamins A, B (complex), B<sub>1</sub>, B<sub>2</sub>, P-P, C, and D; with the teeth and gastro-intestinal tract; with the amount of food needed; and with the more common foods, such as cereal grains, tubers and roots, green leaf vegetables, fruits, and vegetable oils, pulses, milk, meat, fish, liver, kidney, egg; and with faults in African diets. The table of food values at the end gives the protein, fat, and carbohydrate content in grammes per ounce, calorie value, and approximate vitamin value—as 0, V.L. (very little), one, two, or three pluses—of the common foodstuffs of Africa. The book is well printed and bound in soft green linen.

### Notes on Books

Dr L. J. HALPERN of Illinois has written a small volume entitled *How to Raise a Healthy Baby* (Hutchinson's Scientific and Technical Publications; 8s. 6d.) which is intended for parents. It is composed on the question and answer principle, and the information contained seems sound except for a dangerous-looking illustration of a baby having its ears and nose cleaned the *wrong* way. Practitioners may like to recommend it to their patients after looking at it for themselves.

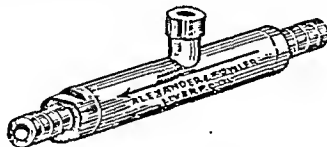
The immediate care that can be given to injured persons at the site of a disaster and methods of transporting them to safety and medical attention are described in a new manual, *Emergency Care of Injured*, issued by the Medical Division, Office of Civilian Defense, Washington. The work is based on procedures and organization developed by the O.C.D. and careful study of three years of British and other air-raid experience. The 117-page book is divided into three parts; "Civilian Defense," "Emergency Field Care," and "Transportation of the Injured."

### Preparations and Appliances

#### A THORACIC ASPIRATING DEVICE

Dr. CLIFFORD RILEY, resident medical officer, Birkenhead Municipal Hospital, writes:

Aspiration of pleural effusion is a surgical procedure which the practising physician frequently has to employ. Various ingenious devices have been evolved to perform this function, they being often either laborious to use or expensive and complicated and "requiring a wheelbarrow" for transport. The device shown in the accompanying illustration has been designed to overcome many of these disadvantages; it consists of two non-return ball valves mounted in a brass casting, with



a side tube to take a standard 20-c.c.m. Record syringe. A rubber tube leads from the suction side to the needle in the chest wall, another leads from the delivery side to a receiver. In use, the handle of the syringe is simply pulled in and out. The whole apparatus will fit into an ordinary 20-c.c.m. syringe box and can be boiled.

Since its construction four months ago the device has been in constant use in the Birkenhead Municipal Hospital and has never failed to function satisfactorily. It aspirates thick pus of the nature of pneumococcal empyemata with ease, and has been found in practice to empty a pleural cavity in about a quarter of the time required by our "Potain" aspirator.

I wish to thank Mr. Grant for his note of appreciation of this device and for his interest in its development, and also Messrs. Alexander and Fowler, of Pembroke Place, Liverpool, who are producing it, who assisted with its development, and who supplied the illustration.

Mr. R. A. GRANT, M.B., F.R.C.S.Ed., medical superintendent of the hospital, writes:

The above ingenious device, invented by Dr. Riley, is in my opinion a considerable advance over any other appliance used for evacuating fluid from the pleural cavity. I have been impressed with the speed and ease with which pleural fluids can be drawn off. It is small, compact, and would be of equal benefit to general practitioners as to hospital medical officers. There is no complicated mechanism to go wrong, and it can be used in conjunction with any Record fitting syringe.

## Nova et Vetera

### HARVEY'S TEACHER AS EMBRYOLOGIST

*The Embryological Treatises of Hieronymus Fabricius de Aquapendente. The Formation of the Egg and of the Chick (De Formatione Ovi et Pulli). The Formed Fetus (De Formato Foetu). A Facsimile Edition, with an Introduction, a Translation, and a Commentary by Howard R. Adelman. (Pp. 833. \$12.00 or 72s.) New York: Cornell University Press; London: Oxford University Press.*

Fabricius of Aquapendente (1533-1619) is known to many as the teacher of Harvey at Padua. His investigations of the veins and of their valves undoubtedly put Harvey on the line of his great discovery. Fabricius has, however, many other claims to remembrance. He was equally accomplished in the practical arts of medicine and of surgery, and he produced the first attempt at a physiology of the special senses as well as several investigations of the organs and functions of speech, of respiration, and of movement. Scientifically his greatest achievements were undoubtedly his treatise *On the Valves of the Veins* (1603) and his two surviving embryological monographs. Prof. Adelman here presents us with the embryological works. He has accomplished his task in this beautiful volume in a way that is beyond criticism. Could all scientific classics be thus set forth, the study of the history of science would pass to a new phase.

Fabricius had intended to issue and had substantially completed a comprehensive treatise on embryology. The first part was devoted to the organs of generation and their mode of action. It has been lost. The second part treats of what Fabricius regards as the process of formation of the embryo, and was in effect a painstaking study of the development of the hen's egg. It was issued in 1621, two years after his death, and has certain obvious hiatuses. The third part, the only one that he himself saw through the press, is *On the Formed Foetus*. It appeared in 1604 and contains comparative accounts of the later embryos of a number of species, including man. Prof. Adelman reproduces both these treatises in facsimile together with a full translation into English. To these he has attached many illuminating notes, a well-conceived biography of Fabricius, and a general history of embryology to the seventeenth century. He has added a painstaking bibliography and a very detailed index. The whole comprises a most attractive book of over 900 pages.

#### Fabricius the Man

Prof. Adelman is certainly no hero-worshipper. Fabricius appears here as an entirely human and credible figure: a rather crotchety professor, intellectually active but physically indolent; more interested in research than in lecturing; peppery and at times indiscreet, but certainly not vindictive; over-optimistic as to his own powers and sometimes a trifle contemptuous of those of others. He was rather absent-minded and inclined to take his duty to his university more lightly than his duty to science, but, nevertheless, he was responsible for the building of the famous anatomical theatre at Padua, and, it is said, at his own expense. He was an excellent teacher, but only for those who wished to learn, which is but to say that most students would call him a very bad teacher! Only when he could bring himself to the effort did his class-teaching reach a high standard, and his best efforts were given to his private courses. Among his pupils were most of the distinguished anatomists of the age—such as Salomon Alberti, Caspar Bartholin, Caspar Bauhin, Giulio Casserio, William Harvey, Pieter Pauw, Adriaan van der Spiegel, and Olaf Worm.

#### A Conservative Philosophy

The positive achievement of Fabricius in the works here edited is very great, and it is almost an excess of the scholar's caution in Prof. Adelman that he does not reckon it as highly as have some of his predecessors. Fabricius was, after Aristotle, the founder of embryology as a rational discipline and as an observational science. But it is unfortunate that so fine an observer should have been perversely conservative in his theoretical views, and it is yet more unfortunate that he should have infected his pupil Harvey with similar qualities. Reading these works of Fabricius by the side of Harvey *On Generation* one cannot feel that the Englishman has advanced greatly on

his teacher, and in certain respects he has even receded. The Achilles heel of Harvey, the superb experimenter, was his obstinately conservative philosophy. Men of science have sometimes thought more about philosophy than is good for their special study. The intellectual lustre of both Fabricius and Harvey is a trifle dimmed, as against certain of the men of their age—as, for example, Vesalius, Sievin, Galileo, and Kepler—by their nostalgia for antiquity. How much more Harvey and Fabricius might have achieved had they known no more of Aristotle and Galen than did Leonardo! What a revolution it was when the Royal Society, a generation later, cut the cable that tied men to the ancient world with the new slogan *Nullius in verba*—"By the words of no man"! Fabricius and Harvey were very great men, but, as Prof. Adelman shows, they must rank just a little below those who had shaken themselves free from the whole tradition of antiquity. Harvey's inspired vision was neither sustained nor repeated. Fabricius, first-class observer though he was, never had the vision. We believe that in saying this we are not misinterpreting the thought of Prof. Adelman.

### A SIXTEENTH-CENTURY SICILIAN PHYSICIAN

The recent prominence in the war news of Sicily and especially of the town of Ragalbuto brings to mind that this town was probably the birthplace of Giovanni Philippo Ingrassias, who was born in 1510. He studied medicine at Padua, graduating from there in 1537. He soon became well known in Italian medical circles and was called to the chair of medicine at Naples. It was at Naples, in 1553, that he published a book entitled *De Tumoribus praeter Naturam*, in which he gave what is the first authentic account of scarlet fever. This disease was known among the countryfolk as "rossalia" or "rosania," and is described by Ingrassias as consisting of "numerous spots, large and small, fiery and red, of universal distribution, so that the whole body seems as if on fire." Scarlet fever was at this time confused by others with measles, but Ingrassias differentiated the two maladies thus: "Some there are who think that measles is the same as rossalia, but we have often seen with our own eyes, that they are different, not trusting to the description of others." He also gave a short description of chicken-pox in the same treatise. His account of this ailment occurs during his discussion on measles and rossalia: "... the other, *crystallos*, which since, as is known, reddish pustules break out and are dispersed over the whole body, the size of a pea, more or less, white and of a shiny crystal appearance which when they are opened one sees an aqueous fluid escape."

Ingrassias returned to Sicily and took up his abode in Palermo in 1560. In this city he became so celebrated that he was called the Hippocrates of Sicily. So great was his fame that he was appointed physician-in-chief to Sicily and the neighbouring islands by King Philip II of Spain in 1563. Ingrassias taught not only medicine but also anatomy, and anatomists associate his name with the lesser wings of the sphenoid bone, and he is accepted as being the first to describe the stapes of the middle ear. During his residence in Palermo, Sicily was ravaged by a severe epidemic of plague, and Ingrassias rendered great service during this crisis. He was offered a pension as a reward for his services, but this he declined—an action so unusual that it is recorded in accounts of his life. He was a prolific writer on many medical topics, both clinical and educational. He died in 1580.

H. P. TAIT.

The *Journal of the American Medical Association* announces that a permanent memorial to William Beaumont (1785-1853), known as the founder of modern knowledge of the physiology of the stomach, has been assured by the transfer of the historic "Enry House" on Mackinac Island to public ownership. In this house the young Canadian half-breed Alexis St. Martin, who was the subject of Beaumont's famous studies, received his accidental shot-gun wound on June 6, 1822, which caused a permanent gastric fistula. In the work of restoring the house technical advice will be given by a committee of the Michigan State Medical Society, the National Park Survey, and other agencies and historical sources.

W. Wespi (*Schweiz. med. Wschr.*, 1943, 73, 1257), who records an illustrative case, states that six cases have hitherto been reported of damage to the peripheral and central nervous system following "sedormid" (allylisopropylacetyl-carbamide). Wespi's case was that of a woman aged 21 who developed toxic polyneuritis after suicidal ingestion of 30 tablets. Recovery took place after several months' illness.



## BRITISH MEDICAL JOURNAL

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## EDUCATION BILL: THE SCHOOL MEDICAL SERVICE

The care of the health and physical welfare of school-children became a function of local education authorities when the Education (Administrative Provisions) Act was passed in 1907. It was extended by the Education Act, 1921. The scope of the authorities' duties and powers has been laid down from time to time by Regulations of the Board of Education, and includes obligatory medical inspection of both elementary and higher school children, and arrangements for attending to the health and physical condition of children, which are obligatory in the case of elementary but optional in higher schools. These latter arrangements have been defined by regulation as including the following-up of cases of defect found at inspection, the detection and prevention of uncleanness, and the medical treatment of defects of the eyes and teeth, minor ailments, and enlarged tonsils and adenoids. In fact most authorities, and virtually all the larger ones, have adopted schemes, with the approval of the Board, which provide for a further extensive range of treatment—for instance, of cripples, children suffering from diseases of the special senses like otorrhoea, from speech defects, and from incipient psychoneuroses. Some orthopaedic hospitals are largely maintained by payments or contributions from local authorities, exercising their dual responsibility for children of both pre-school and school ages. The only specific limitation of the powers of these authorities, as defined by law, is an embargo on their establishing a general domiciliary service of treatment by medical practitioners.

It is difficult to assess in precise terms the benefits derived from the school medical service, but there can be no doubt that it has played a large part in the improvement in the health, physical well-being, and cleanliness of children as compared with thirty years ago. Its work has been as much educational as diagnostic or therapeutic or directly preventive. The excessive claims on its behalf which are sometimes made by lay persons do not originate from school medical officers themselves, but it is significant that teachers—to whom this service brought work, trouble, and disturbance of routine, and who are in a good position to observe results—are among the strongest advocates of its continuance and expansion. For medical officers keenly interested in minor departures from anatomical, physiological, nutritional, and psychological averages it has proved an engrossing field of work, and indeed it has been almost the only wide field for the constant promotion of health in the positive sense. Many, however, have latterly been chafing at the dull routine of much of the

work. It is at least evident that attention to some of the minor ailments they deal with would not have fallen to clinics instead of the family doctor but for the fact that this attention was obtained free or at little cost.

The Education Bill does not set out to change the school medical service but rather to extend its application, although there is a hint, which has been made a little more explicit by a recent statement of Mr. Butler's in Parliament, that such change may come with the establishment of a comprehensive medical service for the nation. There are points of wording in the relevant clauses that deserve careful attention. For instance, the phrase "attending to the health and physical condition" in the Act of 1921 is eliminated and replaced by a blunt reference to medical treatment, which is defined as "treatment by any duly qualified medical practitioner or any person registered under the Dentists Act, 1878." In its context this clearly includes, for the present, treatment by school medical officers and school dentists, and it is evident that school medical inspection and other medical duties are to be carried out by officers employed or engaged by the education authorities. Nevertheless, the duty of an authority is stated in broad terms—viz., "to make such arrangements for securing the provision of free medical treatment for pupils in attendance at any school or young people's college maintained by them as are necessary for securing that comprehensive facilities for free medical treatment are available to them under this Act or otherwise." This seems to make it possible for the treatment of school-children to become, as it ought to be, part of a comprehensive medical service for the people, and not a direct function of education authorities. But medical inspection of all school and college children remains definitely a duty of the authorities. It may not be practicable to perform this duty without employing medical officers specially for the purpose—a position which will raise questions as to the desirability of relegating large numbers of young medical men and women to work entirely divorced from the clinical activities which maintain their interest in medicine. This is a difficulty which must be faced in planning the details of any future service of a general kind.

Treatment does not include treatment at the pupil's home; but otherwise, it will be observed, is to be entirely free of charge. These clauses apply as from April 1, 1945. Unless, and until, a comprehensive medical service for the people is in being, the new provision may cause curious anomalies. The parents of a pupil who is not confined to bed at home will be entitled to demand free treatment for him at either a clinic or a hospital. Indeed, unless the approved "arrangements" specifically prohibit treatment at the surgery of a private practitioner and provide as an alternative adequate facilities for the treatment of ambulatory illness of all kinds among pupils, it seems possible that the parents could ask the authority to foot the family doctor's bill for other than domiciliary treatment. Further, the responsibility would seem to extend to the cost of treatment in voluntary as well as municipal hospitals unless education authorities specifically inform parents that they disapprove of such treatment. Does this mean that education as distinct from health authorities are to enter forthwith into contracts with the managers of these hospitals?



Or, more probably, does it imply that the Government proposes that a comprehensive medical service shall be in operation by April 1, 1945, so that in any case by that time no parent would be called on to pay for the medical treatment of his child? But if this surmise is right, why the exclusion of domiciliary treatment from the free service? The financial memorandum suggests that, however the medical service is provided and administered, the cost will fall on education funds, for it is estimated to involve after seven years an increase in the annual expenditure on education of £6.5 million; but perhaps the inauguration of a general medical service would be accompanied by a transfer of these and existing costs to the appropriate account.

Certain clauses of the Bill mention the school medical officer, but his status is not defined beyond the requirement that he must be a duly qualified medical practitioner. The Minister has power to make regulations which may prescribe that certain examinations shall be carried out by an officer with special qualifications and specially selected for the purpose with the Minister's approval. It may be noted that, whereas the financial regulations relating to the school medical service are the responsibility of the Minister of Health—though this function may be given to the Minister of Education by "arrangement" as at present—the latter is given the regulating power as to the special qualifications mentioned above. The need for abolishing the power of local authorities to subordinate the medical officer to another non-medical official is not met in this Bill; it is an administrative question which the British Medical Association has frequently raised but which may perhaps lend itself more appropriately to regulation.

The administrative provisions contained in the Bill may indicate how the Government's mind is running in other spheres. The President of the Board of Education becomes the Minister of Education, with all the adjuncts of a Ministry. Advisory councils are to be set up separately for England and Wales, the members being appointed by the Minister on the basis of their experience in education. Locally the authorities are the county and county borough councils; but the former may, if they care and if the Minister sanctions, delegate all or any of their executive functions to "divisional executives," although they must remain themselves responsible for borrowing money and raising a rate. Although a county and county borough education committee, to which educational matters shall stand referred, must be established, and must include persons of experience in education so long as the majority of the members are councillors, there is nothing in the Bill to ensure that the divisional executives will contain knowledgeable persons except the Minister's power to modify a scheme. The Minister may also by order constitute a joint education board of two or more major authorities, consisting entirely of members of these authorities, but under the same obligations as to the establishment and constitution of an education committee. It seems unlikely that this piecemeal system of combination on the one hand and delegation on the other for special purposes will go far to meet the clamant need for a general reform of local government.

## MALARIA AMONG TROOPS IN WEST AFRICA

Few countries have a worse reputation for unhealthiness than West Africa, and by "unhealthiness" in the Tropics is always meant malaria. Now that troops in numbers as never before are stationed or operating in some of the most malarious countries in the world it is very important to know what clinical types of malaria are characteristic of such regions. This is so not only that medical officers having to treat cases of malaria perhaps for the first time should know what kind of cases to expect and look out for, but also to give guidance in treatment, convalescence, invaliding, and other arrangements for the medical care of troops. We might also reasonably expect to gain some clue to the effectiveness of suppressive drug prophylaxis and the adequacy of preventive measures as brought to bear in such areas. Further, it is important to know the relative frequency of the different clinical types, and above all what is the most usual class of case being admitted to hospital under such conditions.

It is information of this kind relating to a particular locality in West Africa that has been most adequately given in a paper published in this issue of the *Journal* by Capt. S. B. Hughes and Lieut.-Col. R. R. Bomford. These authors make an analysis of cases seen by them among British troops in two military hospitals in West Africa during 1941 and 1942. The analysis deals with 846 unselected cases. Of these 818 fall within five recognizable types. Of the remainder, 24 were particularly mild cases in which the patients had no fever and complained only of quite minor symptoms, and 4 were cases having jaundice as the principal feature. It should perhaps be noted here that infections other than those of malignant tertian malaria were rare and usually contracted outside the area. Of the 818 typed cases no fewer than 684 were of the "febrile type" (Type 1). These cases, judging by the symptoms described, were what might be called ordinary attacks of malaria such as are common enough among civilian residents and which, as an occasional illness, and apart from frequent repetition, are neither in themselves very serious nor permanently incapacitating to the individual. Vomiting was one of the most distressing concomitants, but was present in only about one-third of the cases. The hot stage lasted from 10 to 36 hours—a very usual period for malignant tertian—and was characterized by the usual high temperature, discomfort, and in some cases prostration. Of the second type, the gastro-intestinal, 11 had vomiting as the chief symptom, 24 were diarrhoeic, and 12 had blood and mucus in the stools. There were 39 of the respiratory type (largely bronchitis), and 10 of the myalgic type with muscular pain and stiffness; 2 only had cerebral symptoms, both cases completely recovering. In less than 10% of all the cases, the authors say, could the patient be described as severely ill, and in less than 1% as dangerously ill. Only 4 developed blackwater fever, of whom 2 died. All the cases were in males aged 18 to 51, who for the most part were in a malarious area for the first time. All were under the observance of antimalarial precautions and the taking of suppressive drug, so far as this could be ensured by disciplinary measures.

It must be admitted that the picture is startlingly different from that gained from descriptions of clinical types of malaria in West Africa as given in many of the older accounts. It is even surprising from the modern standpoint. The conditions in West Africa, so far at least as the coastal belt is concerned and for some hundreds of miles inland, are those now commonly described as hyperendemic—i.e., applying the term strictly, the indigenous population is in a state of almost universal infection, indigenous adults, by reason of immunity acquired in childhood, being largely free from active manifestations of the disease. In such areas European and other immigrant stranger communities, however, suffer very severely not only from malaria but from blackwater fever the result of such malaria. It is not often that European troops on any scale have been exposed to these conditions, though we have a few examples such as the Ashanti Expedition, which, though (like most tropical campaigns) of only some months' duration, was nevertheless a classical example of what malaria can be in such circumstances. That blackwater fever cases in the present instance were so few is to some extent understandable, since this condition rarely develops until after some considerable period of residence, and its occurrence might be expected to be lessened where proper hospital treatment replaced the self-treatment as usually practised by the civilian resident community in such areas. But even so the incidence is less than one might have expected, while the virtual absence of cerebral and other pernicious forms is very noticeable. The authors do not state in what part of West Africa their observations were carried out. But assuming that it was in the malarious coastal zone it is relevant to note that the troops concerned were not only under suppressive treatment during their stay in the country but were subject to other preventive measures. It is not, therefore, beyond the bounds of probability that these measures were responsible for the relatively mild type of infections encountered. It might be asked, then, why our troops should have suffered so severely in the last war in countries where malaria was essentially not more heavily endemic than in West Africa and where protective action was also taken. The answer, we hold, is that it is only in this war that the command and the troops themselves have become really "malaria-conscious," and as a result the measures adopted have been far more thoroughly thought out, carried out, and enforced; and it is not so surprising to believe that they have been correspondingly effective.

### REINTEGRATION AT LINCOLN'S INN FIELDS

The Council of the Faculty of Radiologists has decided that on March 25 the headquarters of the Faculty will be moved to 45, Lincoln's Inn Fields, premises belonging to the Royal College of Surgeons of England. Several clinical associations will make their headquarters in the same building, and a joint secretariat will be established. The associations which have decided to take part in this development are the Association of Surgeons, the British Orthopaedic Association, the Association of Anaesthetists, the British Association of Oto-Laryngologists, and the Council of British Ophthalmologists. The *British Journal of Surgery* also will have an office in the building. Meetings of

committees will be held in the associations' own rooms; councils and general meetings will take place in the Royal College of Surgeons, next door but one to the new offices. The Royal College of Surgeons welcomes this plan, which is designed to establish closer union between specialist departments and general medicine and surgery, and the College will give every possible assistance to ensure the success of the undertaking.

### MORE LIGHT ON THE B COMPLEX

In 1940 Van Etten and others<sup>1</sup> found that the administration of an ample supply of crystalline vitamin B<sub>1</sub> did not prevent convulsions and nerve degeneration in swine fed on autoclaved liver and whey. The experiments of Wintrobe<sup>2</sup> carry the matter a stage further, with an accurate description of symptomatology and pathology in pigs receiving all the known members of the B complex except B<sub>1</sub>. The earliest clinical manifestations were failure of appetite and vomiting, followed by cyanosis, dyspnoea, and bradycardia, and ending with a severe degree of heart failure or sudden death. No abnormality of neuromuscular disturbance, such as ataxic gait, was ever observed. Careful histological examination of the nerve tissues, central and peripheral, gave no evidence of degeneration or inflammation, but in practically every case local necroses of the myocardial fibres were present in both auricles and ventricles. Where the pathological condition had not advanced too far, administration of B<sub>1</sub> led to recovery. Of particular interest are the biochemical findings. The concentration of carbonyl compounds estimated as pyruvic acid was proportional to the degree of severity of the deficiency as judged by the clinical manifestations. A sharp rise in blood pyruvic acid was quickly followed by the rapid progress of the disease. It was also found that a significant increase in blood pyruvic acid after the administration of glucose always occurred in B<sub>1</sub>-deficient animals but not in the control group. As for urinary content of B<sub>1</sub>, it reflected—but by no means consistently—the dietary intake immediately before the collection of urine. Of more value in assessing the degree of B<sub>1</sub> deficiency was the percentage retention of B<sub>1</sub> after a given dose. This test, suggested by Najjar and Holt,<sup>3</sup> gave results which ran parallel with the clinical findings and the amounts of B<sub>1</sub> in the diet.

It is clear from this work that the position of vitamin B<sub>1</sub> as the antineuritic vitamin has been strongly assailed, supporting the sceptical view put forward by Meiklejohn<sup>4</sup> in 1940. He concluded his review with the statement that probably a multiple deficiency is responsible for nutritional neuritis but that there is still a possibility that the true antineuritic vitamin has yet to be discovered. By the use of crystalline vitamins Wintrobe and his colleagues have shown that neither riboflavin nor nicotinic acid has any effect in maintaining the integrity of nervous tissue.<sup>5</sup> It was then found that the ataxic gait and the degenerative nerve lesions brought about by a dietary deficiency of the vitamin-B complex are completely prevented by whole desiccated liver.<sup>6</sup> The anti-pernicious-anaemia fraction was found to be the most potent of the individual liver fractions, none of which are as efficacious as whole liver, even when given parenterally, and the results suggest that there is a need for passage of the nerve-protection factor through the gastro-intestinal tract. Finally it has been

<sup>1</sup> *J. Nutr.*, 1940, 20, 607.

<sup>2</sup> *Johns Hopk. Hosp. Bull.*, 1942, 71, 141.

<sup>3</sup> *Ibid.*, 1940, 67, 107.

<sup>4</sup> *New Engl. J. Med.*, 1940, 223, 265.

<sup>5</sup> *Johns Hopk. Hosp. Bull.*, 1943, 67, 377.

<sup>6</sup> *J. clin. Invest.*, 1942, 21, 71.

shown<sup>7</sup> that the dietary deficiency of either pyridoxine or pantothenic acid leads to an ataxic gait in swine and degeneration of sensory neurons which could invariably be prevented by the administration of these substances. The claim of one of these constituents of the vitamin-B complex is considerably strengthened by the finding that the protective actions of the various liver fractions is proportional to their contents of pantothenic acid.

### OESOPHAGEAL STRICTURE: A REMARKABLE CASE

It is not often that one finds excellent narrative, sustained interest, and valuable information in a medical article, but all these are in an account by Prof. Grey Turner<sup>8</sup> of the treatment of a case of fibrous stricture of the oesophagus in which normal swallowing was quickly restored by simple bouginage. For 19 years the patient had taken all his food by gastrostomy and had abandoned hope of any relief. The patient was a young medical man 26 years old, and himself contributes the case history, which is a model of what a case history should be. The stricture had followed the swallowing of caustic soda at the age of 7, and gastrostomy became necessary soon after. A year later he was taken to Copenhagen, where Prof. Rovsing found what was thought to be complete obliteration of the lumen of the oesophagus and attempted to perform an anterior oesophagoplasty by means of a skin tube. This failed completely, and after a stay of 18 months the patient returned home with a cervical fistula and a gastrostomy, which were eventually connected by a rubber tube through which he took all liquids and solids without disability for many years.

Eventually, while a medical student, the patient began to have severe pain of ulcer type which proved so disabling that he consulted Prof. Grey Turner. Radiographic examination revealed a long stricture in the oesophagus which was said to be absolute, but owing to Grey Turner's experience of similar unpromising cases in which treatment by bougies had proved successful<sup>9</sup> a further attempt at this was advised. The patient was enthusiastically co-operative, and there is no doubt that a great deal of the ultimate success was due to his intelligence, perseverance, and courage. After great difficulty a No. 6 oesophageal bougie engaged in the stricture and eventually was made to pass it; a week later the next larger size could be used. This simple statement hides much dogged endeavour on the part of the patient, who would spend an hour or more, often suffering much physical revulsion, before the passage could be achieved. Grey Turner emphasizes that it is not a question of "passing" or "forcing" the bougie through the stricture, for at no time could this be done by intent. The patient was merely assisted or himself assisted in the swallowing of the bougie. Rapid forcible dilatation of a stricture at intervals, especially under anaesthesia, is not good practice and leads to further damage by tearing scar tissue, which is then followed by more fibrosis and more contracture. The essence of treatment should be the gentle, daily, self-dilatation; the co-operation of the patient is imperative, and in a difficult case not even the greatest skill on the part of the surgeon can replace its absence.

It was soon possible to give some solid food, itself a great additional help, since each bolus acts as a dilator. From this time on progress was rapid—of course aided by the passage of increasing sizes of bougies—so that the patient was able to take all his food by mouth and was discharged from hospital exactly 60 days after admission. He had entered being unable to swallow even saliva by

the natural route, with disabling gastric pain from long wearing of the gastrostomy tube, and without apparent hope of relief from his stricture; and yet he left hospital after this relatively short time able to eat and swallow almost like a normal individual. Apart from minor setbacks his progress was maintained during the rest of his medical studies and even during the arduous duties of a house officer during heavy air raids. Eventually it became possible to close his gastrostomy and later still his cervical oesophagostomy. This was done over a year ago, since when he has served as house-surgeon to Prof. Grey Turner, working hard and successfully with no difficulty in swallowing.

The story of this simple but dramatically successful treatment for what had been thought to be an incurable condition makes most encouraging reading. Grey Turner emphasizes that even in a case with apparent complete fibrous obstruction a narrow, tortuous, but mucous-lined track may exist and may well be exploited to achieve success. It is especially important to bear this in mind in view of the recent accounts of routine anterior oesophagoplasty with jejunal tubes being performed for simple stricture of the gullet.

### OPERATION FOR PATENT DUCTUS

The surgical treatment of congenital patency of the ductus arteriosus has been to the fore in recent years. Examining the records of 57 adults who had had simple patency of the ductus arteriosus and had died, Keys and Shapiro<sup>1</sup> found the cause of death to be subacute bacterial endocarditis in over 40%; 28% died of congestion failure, and 3.3% from rupture of a pulmonary aneurysm. After the age of 17 years patency of the ductus arteriosus was associated with an average expectation of life of about 25 years, or about half that of the general population. These authors concluded that an attempt at ligation is justified in spite of the absence of signs of decreasing adjustment to the defect.

The surgical treatment of the infected ductus is, however, well established. Touroff<sup>2</sup> has operated on 12 cases: seven patients recovered, two died as the result of the operation, and three died of their disease in spite of surgical intervention. Tubbs<sup>3</sup> in this country operated on nine cases: five patients are well after 18 months (the longest after 3½ years), one after 4 months. One patient died from the operation, and the seventh patient, though alive when the paper was written, still had bacteraemia and was reckoned a failure. The combined figures give success in 13 cases out of 21 operated on, with 3 operation deaths. Touroff considers peripheral embolism a *contraindication* to operation when the vegetations have spread from the infected ductus to the mitral and aortic valves. Two of his cases with signs of peripheral embolism were unaffected by operation and continued to have bacteraemia after it. Spread of the infection to the aortic end of the ductus without signs of aortic valve disease will not respond satisfactorily, but it may be difficult to diagnose the condition unless peripheral embolism occurs. It is less certain what the result will be where there is spread of infection on to the pulmonary valve. Cardiac failure, however, and poor general physical condition are not considered to contraindicate operation. One case with pulmonary infarction recovered.

The operation usually consists of ligation of the ductus, though in two cases Touroff divided it. Many of the cases had preliminary chemotherapy without effect, and though it is probable that a short course of drug treatment is advisable, operation must not be too long delayed.

<sup>7</sup> *J. Nutrit.*, 1942, 24, 345.  
<sup>8</sup> *Brit. J. Surg.*, 1943, 30, 344.  
<sup>9</sup> *Ibid.*, 1939, 26, 555.

<sup>1</sup> *Amer. Heart J.*, 1943, 25, 158.  
<sup>2</sup> *Ibid.*, p. 187.  
<sup>3</sup> Hunterian Lecture, R.C.S., April, 1943.

## THE LATE G. C. ANDERSON

## SERVICE OF REMEMBRANCE.

A memorial service for Dr. Anderson was held on the day of the funeral, Wednesday, Jan. 5, in St. Pancras Parish Church, which is close to the house of the British Medical Association. The large church was filled with personal friends and colleagues and representatives of Government Departments, medical bodies, and the many organizations with which the late Secretary in one capacity or another had been actively associated. Such an assembly, many of those present bearing names eminent in medicine and in public affairs, was an indication more significant than many words could have been of the esteem in which he was held and the impress of his personality and work. The principal Officers of the Association and members of Council living in or near London attended, and many members of the Association came from distant Divisions. All grades of the staff at headquarters, from whose building the flag was flying at half-mast, were present. The service preceded the funeral, which was private and took place at Golders Green Crematorium later in the day.

The Vicar of St. Pancras (the Rev. Frank Jones), whose helpfulness in facilitating the arrangements at short notice was greatly appreciated by the Association officials, conducted the service. He was assisted by Mr. Maurice Vinden at the organ. The choir of St. Mark's, North Audley Street, attended, and their lead in the singing of the hymns, "For all the saints," "O love that will not let me go," "The King of Love my Shepherd is," Blake's "Jerusalem," and the twenty-third Psalm, added greatly to the beauty of the service.

## Lord Dawson's Tribute

Dr. H. Guy Dain, Chairman of Council, read the lesson from Ecclesiasticus ("Let us now praise famous men"), and Viscount Dawson of Penn, the President of the Association, ascended the pulpit and paid a short but feeling tribute. "Gathered together at this service of remembrance for George Anderson," he said, "we sorrow for his death, but equally express our thankfulness and admiration for his life." He proceeded to sketch the salient facts of Dr. Anderson's career, pointing out what a background of varied experience in medical practice he had had before beginning his administrative office as Deputy Medical Secretary in 1919.

"His eleven years as Secretary of this great and expanding Association (its numbers nearly doubled during his term of office)," Lord Dawson continued, "coincided with the rising tide of new knowledge, with earnest endeavour to bring within the reach of all citizens services for the furtherance of health and the cure of disease, and widening interest in the health and welfare of the people. Then, as the darkness of war drew near, came his organization of recruitment of the whole profession for war conditions, and when war did come the bringing into action of that vast machinery of which he has been the moving spirit and ever-constant guardian. We may add to this his idea—for it was his—of the Medical Planning Commission, which resulted in a considerable consensus of opinion within the profession in the matter of medical reconstruction, now so imminent for public discussion.

"In the earlier years of his Secretaryship he showed his powers of organization in other fields by the visits of the Association over-seas—I may instance the World Tour and the memorable meeting at Melbourne in 1935. Not only was the organization perfect, but his genius for friendship brought men of different countries together and enhanced the reputation of Great Britain. These are but a few examples of his many activities, which during the war absorbed his laborious days; indeed, the later years of his career were the history of the Association.

"I pass to make reference to the attributes which, combined with his great gifts of organization, made Anderson such an outstanding success as a leader of men. His erect, active body, befitting the athletic prowess of his youth, made him an impressive figure. His charm of manner and his 'forthcomingness' drew men towards him, and his genius for fellowship made the world his parish. Faith and foresight inspired his thought; his power of concentration, his prodigious capacity for work, and his infective enthusiasm got things done.

"In discussion he was receptive, and in speech firm and persuasive, and his gaiety of spirit was seldom far away if proceedings dragged and men were dour. In the course of his work he lit many fires in cold rooms. In conferences and negotiations with Government or other bodies his intimate knowledge of the subject, his judgment, and the complete trust reposed in him made him a strong and welcome representative.

"Anderson's many gifts of mind have been the instruments of his success, but these were not the source of the warmth of regard and affection which he aroused wherever he went and will make his memory long abiding. Underneath all, he loved his neighbour as himself. There was always in his mind a desire to be helpful to his fellows and, forgetting self, to do his all for his day and generation. 'He was a good man and did good things.'

Here our thoughts turn to the partner of his life and his doings, who encouraged his aspirations and shared his struggles, his triumphs, and his trials. To her our hearts extend affectionate understanding. Those who worked with Anderson will profit by what he has so richly garnered, and still more by his high example. We bid him farewell and shall hold his memory in our hearts."

After the Blessing the Vicar read the concluding passage from the second part of *The Pilgrim's Progress*, the story of how Greatheart passed over, and "all the trumpets sounded for him on the other side." This was followed by Jeremiah Clarke's trumpet voluntary, orchestrated by Purcell, and the triumphant tones of Chopin's "Funeral March" brought the service to a close.

## The Congregation in St. Pancras Church

Those present at the service included the following:

Representing the British Medical Association: Lord Dawson (President), Dr. H. Guy Dain (Chairman of Council), Sir Kaye Le Fleming and Mr. H. S. Scuttar (Past Chairmen), Dr. J. W. Bone (Treasurer), Dr. O. C. Carner, Mr. Zachary Cope, Dr. F. Gray, Dr. E. A. Gress, Col. H. A. Proctor, and Dr. S. Wand (members of Council), Sir Farquhar Buzzard (former President), Dr. C. O. Hawthorne (former Chairman of Representative Body), and the following among other representatives of Divisions: Dr. G. E. Orme (Westminster and Holborn), Dr. A. Baldie (Marylebone), Dr. H. S. Pasmore (Kensington), Dr. A. T. Rogers (Bromley), Dr. A. P. Ford (East Herts), Capt. Laurie Smith (Blackpool); also the Officials of the Association, the Solicitor, and many members of the staff at B.M.A. House from all the departments. Severe illness prevented Dr. Alfred Cox from attending.

The Ministry of Health was represented by Sir John Maude (Secretary), Sir Wilson Jameson (Chief Medical Officer), Prof. F. R. Fraser (Director-General, E.M.S.), Sir Weldon Dalrymple-Champneys (Deputy Chief Medical Officer), Dr. F. Murchie, and Mr. A. W. Neville (Principal Assistant Secretaries). Other representatives of Government Departments were: Dr. J. Alison Glyke (Board of Education), Dr. E. R. A. Merewether and Mr. R. W. Luce (Ministry of Labour and National Service), Dr. A. G. H. Smart (Colonial Office), Dr. A. Sandison (Ministry of Pensions), Mr. R. B. Crabb (Ministry of Fuel and Power), Lieut.-Gen. Sir Alexander Hood, Director-General, represented the Army Medical Services, and Mr. Louis Infield represented Sir Geoffrey Shakespear and the Medical Personnel (Priority) Committee.

The Royal College of Physicians was represented by Prof. F. S. Lanzmead and Dr. H. E. A. Boldere (Registrar), and the Royal College of Surgeons by its President (Sir Alfred Webb-Johnson), Surgeon Rear-Admiral Gordon-Taylor, and Sir Hugh Lell. The following bodies were represented by their Presidents: the Royal College of Obstetricians and Gynaecologists (Mr. Eardley Holland) and the Royal Society of Medicine (Sir Henry Tidy), and the Society of Apothecaries by its Master (Sir Stanley Woodward). Other representatives of medical bodies were Sir Edward Mellanby (Medical Research Council), Dr. A. Hope Gosse (Medical Society of London), Dr. Janet Aitken (Medical Women's Federation), Dr. J. C. Bridge (Association of Industrial Medical Officers), Dr. E. Goodwin Rawlinson (Royal Institute of Public Health and Hygiene), Dr. Alan Moncrieff (British Paediatric Association), Dr. Charles Newman (British Postgraduate Medical School), Major H. Leekwood Stevens (London School of Hygiene and Tropical Medicine).

Others who were present were the Viscountess Dawson of Penn, Lady Moran, Dame Louise Mellroy, Sir Henry Dale, P.R.S., Prof. T. B. Johnston, Mr. W. McAdam Eccles (also representing the British Social Hygiene Council), Mr. James Wyatt, Miss Elizabeth Bolton (London School of Medicine for Women), Sir T. P. Dunhill, Sir Arnold Lawson, Brigadier J. R. Rees, Col. C. B. Heald, Sir Robert Stanton Woods, Prof. J. R. Larnmonth, Capt. G. S. Ellison, M.P., Alderman Sir David Davies, Surgeon Rear-Admiral Malone, Dr. H. Crichton-Miller, Dr. Andrew Topping (London County Council), Dr. S. C. Acock (Reading), Dr. G. Clark Trotter (Hampstead), Mrs. Scott (representing Dr. C. F. T. Scott, Willstead), Dr. Arthur Ricketts, Miss C. Neill (representing Lady Neill), Mr. H. L. Jackson (H. K. Lewis and Co., Ltd.), Dr. Lina Potter, Dr. Margaret Jackson (Lancet).

Representatives of various medical and ancillary organizations included Dr. J. B. Mennell (Association of Anaesthetists), Dr. J. R. Whitwell (Royal Medico-Psychological Association), Dr. Harley Williams (National Association for the Prevention of Tuberculosis), Capt. E. J. C. Chapman (British Empire Cancer Campaign), Dr. R. Sutherland (Central Council for Health Education), Dr. Robert Forbes (Medical Defence Union), Dr. C. L. Battison (London Panel Committee), Dr. L. G. Glover and Mr. E. C. Pennefather (Royal Medical Benevolent Fund), with Lady Woodward representing the Ladies Guild.

Miss Macfie (Royal College of Nursing), Mr. H. N. Linstead, M.P. (Pharmaceutical Society of Great Britain), Mr. T. Heselthine and Mr. G. A. Mallinson (National Pharmaceutical Union), Mr. Donald Cox and Mr. W. G. Senior (British Dental Association), Mr. Horace H. Rew (Examining Board for England), Prof. Samson Wright and Mrs. Haigh (Central Office for Refugees), Mr. P. W. L. Camps (British Hospitals Association).

Other bodies represented were: London Insurance Committee, National Association of Insurance Committees, National Association of Clerks to Insurance Committees, National Amalgamated Approved Society, Joint Committee of Approved Societies, National Federation of Employees Approved Societies, National Ophthalmic Treatment Board, Guild of British Dispensing Opticians, King Edward's Hospital Fund for London, Hospital Saving Association, British Hospitals Contributory Schemes Association, War Organization of British Red Cross and Order of St. John, Industrial Welfare Society, Clerical, Medical, and General Life Assurance Society, Medical Sickness, Annuity, and Life Assurance Society, Medical Insurance Agency, British Medical Bureau, Public Dental Services Association, Chartered Society of Physiotherapy, and the Magistrates Association. Also represented were the Sandy Lodge Golf Club and the Rotary International.

### FURTHER TRIBUTES

The following further appreciations of Dr. Anderson have been received, supplementing those written by Sir Kaye Le Fleming, Mr. H. S. Souttar, and Dr. H. Guy Dain, and published in last week's *Journal*:

Lord MORAN, President of the Royal College of Physicians, writes:

The loss of a man like Anderson, who had worked at the headquarters of the British Medical Association for a quarter of a century, would be felt by the profession at any time; just now it is nearly irreparable. Others are more competent to record what he did for the Association, but I want to say something of the work of the Association for the nation. It planned for war in peace, when foresight was not common. The register of doctors, which Anderson designed, made it possible when war came to preserve a just balance between the demands of the Services and of the home front. For he was a realist. He knew what the average doctor was thinking, what he would accept and what he would not, and this knowledge gave him poise and lent weight to his word in council. He had the independence of his race, and the down-right honesty of his speech was the expression of a mind that had not been touched by the blight of routine. He could see, beyond the interests of the members of the Association, what was good for the country as a whole. When he had to say things that were unpalatable, he said them to your face, disarming criticism, so that when I came to propose his election to the Fellowship of the Royal College of Physicians, at a time when the policy of the College and that of the Association were sometimes at variance, it was typical of the man that there was no opposition of any kind to his election.

In his youth there was a time when no Scot could live with him over hurdles, and he kept to the end the easy way with men which often has a beginning in the good fellowship of sport.

Anderson felt the burden that presses on those who have to make decisions on matters of moment for others, but he found comfort always where alone it can be found: in the integrity of his own mind and in the quiet peace of his home.

Prof. R. J. A. BERRY writes:

As a member of Council who has probably known personally the late Dr. G. C. Anderson for a longer period of time than any of my colleagues it seems fitting that I should assume the privilege of a friend to say a few words of farewell.

In those now distant days when the intelligentsia of the period were fond of describing the times in which they lived as *fin de siècle*, and the less intelligent were vehemently arguing whether the year 1900 was the last of the nineteenth century or the first of the twentieth, there walked into my retiring room at the anatomy department of the New School of Medicine of the Royal Colleges of Edinburgh a tall gracefully built youth who expressed his desire of joining the anatomy classes then under my charge. A student of the University of Edinburgh, he gave his name as George Cranston Anderson. From that moment there was born between us a firm personal friendship which only terminated on Jan. 1, 1944. In those days the association between teacher and taught was more close, intimate, and personal than it is to-day, and on the whole I think the loss is the teacher's. With Anderson's graduation, his departure to the kingdom of Fife,

and my own parting from the city of our dreams, our ways in life were naturally sundered but never dissolved. Always, on returning from over-seas to London, one of the pleasures was a call upon George. Here was conviction, if indeed conviction were needed, that in him, as revealed by his talk, the Association had secured the aid of a loyal, devoted, and enthusiastic servant. Confronted as he constantly was by a multitude of diverse minds, never once did I hear him speak unkindly of those from whom his duties sometimes compelled him to differ.

Recently at Manchester, and for the last time, I heard Anderson address an enormous congregation of medical men, not all of whom were at one with him. Nevertheless Anderson's tact, his courtesy, his powers of explanation, his mastery of his subject, and an all-pervading good humour, afforded a most convincing proof of his devotion to his colleagues and the best interests of the Association he was so proud to serve. "Evolution, not revolution," and never did Anderson plead more convincingly or with greater effect. "Let us have faith that right makes might; and in that faith let us, to the end, dare to do our duty as we understand it," and George Cranston Anderson did it to the very end.

Lieut.-General Sir JAMES A. HARTIGAN, K.C.B., writes:

Will you allow me to express my very real regret at the death of Dr. Anderson? During the four years I was at the War Office I was in close touch with him, and learned to appreciate his clear and active mind, his powers of administration, and his far-seeing vision. I would say that his main aims in life were to do all in his power to provide the best medical care for the community at large, and to further the interests and prestige of his profession. He was very quick at reaching the kernel of a problem, however complicated, and he always expressed his views with admirable clearness and brevity. To any scheme which had for its object the advancement of the medical branches of the Defence Services he gave his whole-hearted support. He possessed many statesmanlike qualities, and during the years to which I refer had a more lively appreciation of the dangerous position of his country than was usually held at that time. I used to think that he would make an excellent Member of Parliament. He was delightful to work with, and I retain very pleasant memories of my association with him. His passing at this time is a grievous loss to the profession.

### THE FIGHT AGAINST RHEUMATISM

The seventh completed year of the Empire Rheumatism Council is the subject of a report by Lord Horder, its chairman, who comments upon the reduction in the annual number of deaths from acute rheumatism (which may be taken as largely synonymous with juvenile rheumatism) in England and Wales during the five-year period 1938-42. The number fell by almost exactly 50%. Corroborative evidence of the gradual conquest of this form of rheumatism is forthcoming from the Council's Research Foundation, which shows that the incidence of acute rheumatism among a large number of youths has steadily declined during recent years. This decline coincides with an increasing measure of effective control and treatment so far as the child is concerned. On the other hand, for adult rheumatism the means of effective treatment have been available for only a small percentage of sufferers, and here there is no evidence of decrease. The treatment centres report great increases in the number of patients seeking treatment; in one London hospital the number treated in 1943 was almost double that for 1942.

#### Clinical and Laboratory Investigations

The Council, in spite of obvious wartime difficulties, manages to keep going a considerable amount of research, both laboratory and clinical. The laboratory work has included flocculation tests of an antibody in certain rheumatic sera and antihistase titration and serum treatment, and the clinical research a study of the value and correct dosage of gold salts in the treatment of some forms of rheumatic disease, and into the efficacy of an enzyme preparation. Attention is drawn to the great difficulty in carrying clinical investigations to conclusive results owing to the lack of centres at which tests can be done under adequate control conditions among

considerable groups of patients for a sufficient length of time. It is hoped that the promised post-war development of national health services will remedy this. The Council is expecting shortly to have direct discussion with the Minister of Health concerning the assurance given more than two years ago of the Government's intention in its national health policy to ensure that everyone will receive treatment appropriate to his needs. Mention is made of a report from Moscow of a discovery by Bogolometz, of the Russian Academy, of a serum which is claimed to have definite effects in the treatment of arthritic conditions arising from rheumatic disease. Lord Horder has communicated with this Russian scientist asking for further particulars, and inquiring whether it is possible to send a supply of the serum for test.

## NEW YEAR HONOURS

The names of the following members of the medical profession were included in the final section of the New Year Honours List published in the *London Gazette* of Jan. 4:

### O.B.E. (Civil Division)

THOMAS RICHARD WEBSTER ATKINS, L.R.C.P.S. Ed. Ship Surgeon, Merchant Navy.

FRANK SEBASTIAN COCKSEY, M.D. Medical Officer of the Rehabilitation Department, Horton Emergency Hospital.

GEORGE MACFAR, M.B., C.M. For public services in Lanarkshire.

JOHN CHANCELLOR MCKENZIE, M.B., Ch.B., J.P. Commissioner of Medical Services, Scotland Region, Ministry of Pensions.

EDWARD LOGGIE MIDDLTON, M.D., D.P.H., H.M. Medical Inspector of Factories, Ministry of Labour and National Service.

WILLIAM JOHN RICHARD, M.B., C.M., F.R.C.P.S. Medical Superintendent, Emergency Hospital, Law Junction, Lanarkshire.

JANET MARIA VAUGHAN, D.M., F.R.C.P. Organizer of the Royal Naval Blood Transfusion Service Centre.

MRS. MARTHA ISABEL GARVICI, M.B.E. Senior Lady Medical Officer, Egyptian Ministry of Education.

### M.B.E. (Civil Division)

MRS. HARRIET MINNIE LÉVICK, M.D. County Borough Organizer, Middlesbrough, Women's Voluntary Services for Civil Defence.

GERALD EARL THORNTON, M.B., B.Ch. Chairman, Air Training Corps Local Committee, Salisbury.

## TRELOAR CRIPPLES' HOSPITAL

It is hard to realize that it is 35 years since Sir William Trelor at the London Mansion House planned what is now called Lord Mayor Trelor Cripples' Hospital and College (the college is for training boys in various trades) under the medical superintendency of Sir Henry Gauvain. At first cases of non-pulmonary tuberculosis were received at Alton, and afterwards the benefits of the hospital came to be extended to all the crippling diseases of childhood. Portsmouth was the area which benefited first, then the whole of Hampshire and the Isle of Wight, and now patients are taken from any part of the country or the Empire, though, of course, the after-care of distant patients has to be delegated to others. The help of the plastic surgeon has been increasingly invoked, first to treat facial disfigurements the results of lupus vulgaris, then all kinds of congenital or acquired deformities or deviations affecting the appearance. The latest medical report states that during the year 112 plastic cases were admitted and underwent 163 successful operations. The applications for admission for cases of tuberculosis of the bones and joints are rapidly diminishing—for example, the percentage of admissions for tuberculous disease of the spine, which was 40 in 1912, was down to 3.6 in 1942. Of the other cases admitted during the year under review 234 were of an orthopaedic character. About 1,500 splints and surgical appliances were made and repaired in the splint shop, and nearly 7,000 treatments were given in the light department. Out-patient clinics are held regularly in 14 towns within reasonable distance of Alton.

Continuing its practice of issuing small, neat, but comprehensive leaflets of advice on health matters, the Central Council for Health Education has chosen the title "Right Dress for Health" for a most useful one on the way to dress in differing temperatures. "Just Nerves" is a good title for advice to the "worriers" of this world, while "War on Disease," as its name suggests, covers infectious diseases generally. All these leaflets, as well as one on "How to Avoid Influenza," may be obtained from the offices of the Central Council, Tavistock House, Tavistock Square, W.C.1.

## Correspondence

### Consultant and Specialist Services

SIR.—In March, 1943, at the invitation of the Minister of Health, the Royal Colleges combined with the British Medical Association and other bodies to form a Representative Committee in order to discuss with the Minister the formation of a comprehensive medical service. Apart from the common duty of planning this service for the country, the Colleges have a particular responsibility in regard to the consultant and specialist services, and we think it right to explain what we have done to discharge that responsibility.

In the first place, when the Standing Joint Committee of the three Royal Colleges requires information and advice in matters concerning the special branches of medicine and surgery it refers to the official bodies representing those branches.

The College members of the Representative Committee are briefed and advised by an existing committee of the Colleges. This committee consists of: (1) 13 representatives of the Royal Colleges; (2) 2 representatives nominated by the teaching hospitals of each University in England, Wales, and Northern Ireland; (3) 11 representatives from the non-teaching hospitals; (4) 1 representative from each of the specialties.

This committee, apart from its representative character, provides machinery for referring questions to its constituent bodies—an essential provision, in our judgment, of any committee which sets out to give advice on such important matters as terms and conditions of service. By these means the Colleges hope to keep in touch with the views of consultants and specialists throughout the country, so that they may give effect to them in any action they may take.

The Colleges have also taken steps to ascertain what consultants and specialists are available at the present time. It is clear that the Minister of Health must know how many consultants there are and where they are available, and he is having a survey made under the direct auspices of the Royal Colleges, who are acting in this matter in co-operation with the Universities and representatives of the British Medical Association. The result of this survey will not be published; it is for the personal guidance of the Minister.

Previously, the Colleges had laid down certain standards which they thought should be required of any practitioner who wished to become a consultant in the future. These criteria are not meant to be retrospective. They will only affect those taking up consultant work in time to come. The only criterion required now is that a man is accepted as a consultant by the practitioners in his neighbourhood. Each district is therefore being asked to supply the necessary information.

In our view, the services of every consultant who is now recognized as such by the profession in his neighbourhood will be needed in any consultant service that may be set up after the war. We think it probable that provision may be made which will enable practitioners who hitherto have not been exclusively engaged in consulting practice to devote themselves solely to consulting work.—We are, etc.,

MORAN,

President of the Royal College of Physicians.

ALFRED WEBB-JOHNSON,

President of the Royal College of Surgeons.

EARLDY HOLLAND,

President of the Royal College of Obstetricians and Gynaecologists.

London.

\*\* It is useful to recall in this connexion the procedure which the B.M.A. has decided to follow in order to ascertain and express the views of the profession as a whole on the White Paper. It was described in the *Supplement* of Jan. 1, and is summarized under "Future Procedure" in an important letter sent to all practitioners serving over-seas and to all medical prisoners of war. This letter is reproduced in full in the *Supplement* this week. It will be seen that the proposed procedure includes the issue of a questionnaire, prepared by an independent expert body, to every member of the profession



at home or abroad, whether member or non-member of the Association. The whole question of the machinery for establishing a consultants list or lists is now under consideration by the B.M.A., and in due course a statement will be made. —Ed., *B.M.J.*

### The Prisoner-of-War Mentality

SIR,—I have read, as thousands of others have read, Major P. H. Newman's human and thoughtful article (Jan. 1, p. 8), and it assuredly must have set many heart-cords in vibration. Masterly though his impressions are, they give but part of the picture which is yet to be revealed to us, for I assume he has no experience beyond the prisoner-of-war mentality in respect of Europe.

As no Service prisoners of war have been exchanged by the Japanese, and as only a mere handful have escaped (and so far as I know none of these were doctors), we still have yet to learn how the 130,000 prisoners and internees stood up in the three stages outlined and how they will react in Stage IV—the repatriation period. It is the "lengthy period of boredom," already amounting to two unrelieved years, which must leave its permanent marks on these men and women, for the Japanese have studied how best to inflict mental anguish on their captives as opposed to the physical atrocities described in the House of Commons and elsewhere, and such anguish dates right from the "breaking-in period" and must accentuate mental symptoms; witness their refusal to allow International Red Cross delegates to visit camps, their refusal to accept parcels, comforts, and medical supplies, their holding back of some quarter of a million letters from relatives to prisoners, their refusal to recognize any messages to prisoners other than twenty-five words on a card at monthly intervals, and so on, all of these inflictions costing the captors nothing but meaning so much to the mentality of the prisoner. These are very, very slow wearing-down cruelties, the relief of which can result in no "acute emotional reaction" but a chronic psychological stigma.

On Jan. 1, 1944, a card was received from a prisoner of war, Hong Kong, in which he states that no educational facilities are allowed; most of the time was spent in playing chess, presumably with home-made pieces. It is significant that this and many other cards in this recent batch bear no dates; in any event such news as comes or goes is well over six months old—another cheap and studied way to promote anxiety.

There is only one class of man or woman who can experience all this (and much more) and who can be rehabilitated to fit into normal reconstructed society again—and that is the "superman." The remainder will be a problem for their lifetime.

The suggestion for an organization for the aid of returned prisoners of war is an admirable one; indeed, such a formation will probably be essential; but it is doubtful whether it is desirable to form yet another body. The Government Departments—Navy, Army, Air Force, and others—cannot do these men ashore, demobilize them, and so wash their hands of it all. Such a mechanism surely exists in the War Organization of the British Red Cross Society and Order of St. John of Jerusalem, for which body our prisoners have the highest regard and affection, and to whom they and their relatives would naturally turn for any subsequent assistance. The medical personnel, particularly on its psychological side, may need amending for this purpose, but there are offices already in all large towns—e.g., over 100,000 population—and smaller, and, moreover, the organization is world-wide.

But before any of this can be arranged we still have to wait and see what these Asiatic barbarians will do to our prisoners as the war progresses.—I am, etc.,

Pells Wood, Kent.

B. RICHARDSON BILLINGS.

### School Medical Service

SIR,—Ever since the inauguration of the School Medical Service school medical officers have frequently drawn attention to the verminous conditions so prevalent among large numbers of the children attending the public elementary schools. Though public opinion was scarcely affected by such reports it was exceedingly stirred as a result of the publicity given to these

matters following the Government's evacuation scheme. The Ministry of Health and the Board of Education then addressed special memoranda to local authorities on the matter, and authorized the appointment of additional staff in an endeavour to cope with the situation. The cumbersome Seabies Order was also issued (under the Defence of the Realm Regulations) to strengthen the hands of those who had to deal with the unwholesome conditions. In view of these circumstances it is surprising to find that Section 52 of the Education Bill, if allowed to become law, will seriously curtail the existing powers of school medical officers and nurses and transfer them to the head teachers, who are to be judges, juries, and appellates. If this reactionary section is not drastically amended an absurd position will arise whereby regular cleanliness surveys by the school nurses will no longer be possible. In consequence of this many primary-school children with negligent parents will almost certainly revert to that disgraceful condition so frequently met with in the first few years after the inception of the School Medical Service.—I am, etc.,

Liverpool.

R. GAMLIN.

### Actiology of Sciatic Pain

SIR,—It would be a sad thing for the many sufferers from sciatic pain in this country if their doctors took notice of the so-called "rational" treatment advised by Sir Arthur Hurst (Dec. 18, p. 773). They would have to be told first that their pain was imagined; secondly, that the only thing for it if they persisted in believing in its existence was prolonged rest in bed perhaps with their hips and affected limb encased in plaster-of-Paris; and, thirdly, that if they still complained of pain they would be handed over to a neurosurgeon to have a severe operation on the spine for removal of a node on an intervertebral disk. It is perhaps useful to "debunk," as Sir Arthur Hurst does, the treatments of the past—notably introduced, as it happened, mainly by physicians. It is another and quite unjustifiable thing to state a treatment having, except in one part, no apparent rational basis whatever.

There is no more important subject in medicine to-day than backache with associated pain in the limbs, because of the amount of disablement and loss of work it entails. It is absurd and unkind to brush it aside as hysterical. Mainly through the work of orthopaedic surgeons and of some radiologists and pathologists, a great deal more is known about this subject now than formerly. It is certain that there are a number of physical causes which can be readily determined by thorough examination, and that pure hysteria and malingering are rare. In 20 years of orthopaedic practice I have dealt with an estimated 7,000 cases of backache with or without radiating pain, and for the last 10 years have treated not fewer than 500 to 600 a year. I have rarely seen a case without a physical basis for the symptoms, though, as in all clinical states, the reaction of patients to pain varies, and there is in many cases an associated psychological factor.

It is a pity to find the term "sciatica" still being used in your Journal. It is in use by the public to describe any pain in the leg (and even elsewhere!) and many doctors are nearly as vague. Sciatic pain is felt only in the buttock, outer and/or posterior aspect of the thigh and calf, and outer side of the foot. Sufficient is known now of the causes of pain in this distribution to make it as unjustifiable to use the term "sciatica" as if it were a single disease as to speak of abdominal pain instead of the different lesions which may be manifested by such pain. It is clear that sciatic pain may arise either (1) from an inflammatory or traumatic lesion of the fibrous tissue of the ligaments or fasciae in the lumbo-sacral and gluteal regions, or (2) from irritation of the roots of the lumbo-sacral plexus. The former includes fibrositis with or without localized tender points and fibrosis of ligaments following sprain or associated with disease of the bones or joints. Fibrositis may be doubtful in its actiology and pathology, but there is no doubt that it is a definite physical disorder. Chronic sprain in the lower back may be caused by accidental injury, persistent occupational strain, or strain from deformity—postural, congenital, or due to neoplastic, tuberculous, or other disease—or to degeneration of the intervertebral disks. The various states included in this category, especially fibrositis and osteo-arthritis without or with degeneration of the disks (spondylosis deformans), are certainly the most common causes

of low back and sciatic pain, as they are of similar pain at higher levels of the trunk and in the neck and upper limbs. The distinguishing character of sciatic and other radiating pain from these lesions is that it is purely "referred," not accompanied by objective neurological signs, though there may be subjective symptoms. Appropriate orthopaedic treatment, after determination and elimination when possible of aetiological factors such as focal sepsis, gives relief of pain in most cases.

Sciatic pain is far less often due to irritation of the roots or trunks of the lumbosacral plexus. Such irritation may arise from a rupture into the vertebral canal of the intervertebral disk between the fourth and fifth lumbar or the fifth lumbar and first sacral vertebrae, or from perineuritis, as well as from rarer lesions such as neoplasms and arachnoiditis. I believe that posterior disk rupture is not so common as some enthusiasts consider, and that there is a danger of many spines being operated upon unnecessarily if cases of persistent sciatic pain are thought to be only neurosurgical, and if reliance in diagnosis is placed only on neurological signs. Having made, as a B.M.A. Research grantee, between 1926 and 1931 a study of the intervertebral disks and of the work of the few others in the world interested in the subject at that time, I have since then been on the look-out for cases of posterior disk rupture. Yet between July, 1937, when I diagnosed and treated perhaps the first case operated upon in this country, and the present time I had only 20 certain cases of this lesion (including one in the cervical and one in the thoracic region) out of some 4,000 cases of backache with or without radiating pain—that is, 0.5%. Considering only cases with sciatic pain, the incidence of disk rupture would, of course, be higher, but probably not more than 2% of all such cases. Disk rupture is scarcely to be considered as a possible cause of pain of recent onset in patients over the age of 40 years, as by then the disks have become too fibrous to be ruptured. Between the ages of 20 and 30, when the disks are highly elastic and still have soft centres but the spine has not quite the same resilience to trauma as in earlier years, is the period when disk rupture and the pain it may cause are most likely to occur.

Perineuritis of the sciatic nerve roots—so-called true sciatica—may never have been demonstrated, but I believe that it does occur, though it is certainly one of the less common causes of sciatic pain. By sciatic perineuritis I understand a condition with an identical clinical picture to posterior disk rupture but distinguishable from it. Both show, in addition to the typical pain in the limb, impaired or absent sensibility to pain and touch in the same distribution to a greater or less extent, diminished or absent ankle-jerk, and deviation of the trunk to the affected side in all positions or at least in bending forward when standing. In my observation these are the only states of sciatic pain which give pain in the leg on straight leg raising: in sacro-iliac lesions the pain is localized to over the sacro-iliac joint; in fibrositis and sprain in the gluteal or lumbar region it is also localized and corresponds with the tender points; other causes of sciatic pain do not give this sign at all. Myelography with iodized oil is the only positive way of distinguishing between perineuritis and disk rupture, as it shows up the rupture, but it is not infallible and should probably in any case be followed by laminectomy, as the oil may cause arachnoiditis if left in. For this reason it should be the last means of diagnosis after all causes of pain other than disk rupture have been eliminated. Another way of distinguishing between these two states is by epidural injection of local anaesthetic in saline into the sacral canal. The symptoms of many cases of perineuritis will disappear spontaneously with the elimination of remote focal sepsis. If they persist, epidural injection is usually effective immediately and permanently, but it has no effect in cases of disk rupture. I have made this injection in many cases and am sure that it effects a not merely psychological. It is not certain how it acts any more than it is clear how other medical empirical treatments of proved efficacy act.

Of course there is often a psychological factor in sciatic pain, but it is no more significant in such cases than in other clinical states. To maintain that it is the chief or only factor is an attitude of despair—or of vain hope—towards an important cause of suffering and disablement. To put patients to bed without an exact diagnosis may by chance relieve the

pain of a few, but for most wastes time and money and impairs the prospect of obtaining lasting relief by thorough investigation and treatment.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

### Sciatica

SIR.—Sir Arthur Hurst, in his masterly survey of sciatica (Dec. 18, p. 773), appeared to establish the existence of a hysterical background—i.e., a psychological factor in the cause of the disorder—but in his remarks on treatment he entirely ignored any psychological approach to this factor. Physical trauma or exposure to the elements were assumed to be the cause of this admittedly semi-hysterical disease, and the psychological aspect was dealt with by forms of suggestion, more or less drastic, and directed towards the developed condition rather than towards a possible psychological cause.

The trauma complained of by the sciatica patient is reminiscent of the individual who contracted gonorrhoea by "straining himself," and the exposure, usually an imaginary draught, is similar to that blamed for the onset of facial neuralgia. An incontrovertible, severe, physical catastrophe—such as the kick of a horse, a fall from a two-story building, or a night spent lost on a mountain—rarely precedes either disease.

Those of us who have acquired a psychosomatic outlook believe that not only is the discovery of infidelity in a wife or the fear of impending bankruptcy more potent to lead us to becoming generally "run down" than excessive physical exercise, but that particular forms of mental strain and emotion appear to cause stress on specific parts of the organism, and result in definite types of disease or disorder. Treatment then indicates investigation with a view to unveiling: "What did he experience just before he took sciatica, and what emotions did he feel?" While it is true that a happening sufficiently severe to cause physical illness is invariably repressed and positive transference must be established to find it, the quest does not demand forty séances. It is often possible to reveal the upset and discuss the patient's future adjustment to it, all inside half an hour, especially if one has some knowledge of the emotion associated with the disorder under consideration.

A.B., an actor, comes home from tour to find his wife leaving the house with another man (on her way to take up residence with him) and taking her three children with her. Within a few days A.B. has pain extending from the left hip to the great toe. Two weeks later he is sent to hospital, where he receives treatment covering a wide range. He remains off work for five months, and in the course of the following six years has many recurrences, being off work in all nearly eighteen months. Superficial analysis of his thoughts and emotions: "The foundation of his life was no longer secure; deprivation of loved persons; loss of self-respect; desire to strike back." The experiences of patients just preceding the first attack of sciatica may be of infinite variety, but the emotions and feelings are of the same order. Permanent cure follows the regaining of solid ground under his feet with capacity for adjustment to his future.—I am, etc.,

Glasgow.

G. GLADSTONE ROBERTSON.

### The Cardiac Index

SIR.—Mr. Harold Dodd in his paper on the cardiac index (Dec. 25, p. 811) remarks that "it is seldom taught, and, because of this, when it is mentioned it meets with some scepticism." What this index represents is not clear; empirically it is stated that values above 100% and below 25% make the patient a poor surgical risk. "Abdominal distension, chestiness, pulmonary embolism, delirium, strange moods of manner, or sepsis" are given as post-operative sequelae of a too low or too high cardiac index.

To quote his example: "In elderly people the blood pressure is often around 140/70, giving a cardiac index of 100%" (i.e., abnormal and a contraindication to operation). Such a pressure is, of course, perfectly normal in an elderly patient; but he goes on to say that "pre-operative rest in bed for one, two, or three weeks, with a fluid intake of 6 to 8 pints daily and cardiac tonics, approximates these figures to, say, 130/80." It is well known that variations of ten points either

way may occur from day to day and from observer to observer: certainly such changes of themselves could not be taken to indicate any alteration in the efficiency of the cardiovascular system. What cardiac tonics are used? And what are "gentle" cardiac tonics? Why 6 to 8 pints of fluid a day? It is difficult to understand how such quantities of fluids are going to benefit a patient with fibrillation, as restriction of fluid is one of the standbys of treatment of the failing heart. Clinical details are not given, but if these patients were not in failure, then cardiac tonics and excess fluid do not seem to have been indicated for patients where fibrillation was apparently paroxysmal. In any case I imagine that different observers would arrive at widely varying cardiac indices when confronted with a fibrillating heart.

The statement that "the blood-pressure figures in themselves mean little" is most disturbing. A simple example will indicate the danger of such an assumption. A patient might be in marked left ventricular failure with a blood pressure of 200/140. This would give, according to definition, a cardiac index of 43%, which indicates a "fair surgical risk." Were the cardiac index to be generally adopted as an important criterion of operative risk—and, as Mr. Dodd makes little mention of other findings in his patients, one assumes that he attaches great importance to it—one hesitates to think of the large number of patients denied operation when urgently needed, and the equally large number who would be operated on when in no fit state.—I am, etc.,

Botleys Park, Surrey.

G. R. FEARNLEY.

#### Blood Pressure in Surgery

SIR,—All anaesthetists will agree with Mr. Harold Dodd (Dec. 25, p. 811) in stressing the importance of continuous blood-pressure and pulse-rate recordings during major operations. It is hoped that the combined anaesthetic charts and record cards designed by Dr. M. D. Nosworthy and now being tried out in many hospitals will soon become universally used.

Mr. Dodd places considerable reliance on the "Moots-McKesson cardiac index," saying that if it is below 33% or over 85% the post-operative outlook is poor. Unfortunately anaesthetists generally have been unable to place much confidence in any of the usual cardiac efficiency tests, such as those of Barach, Crampton, Moots, and Sebrasez. The Crampton test would seem to be the most scientific and has been adopted by the Athletic Association of America. It is not, however, applicable to bedridden patients. Dr. W. S. Sykes made an investigation of Barach's and Moots's tests in patients dying from cardiac failure in the medical wards of a large hospital. In no less than 62% of tests the results were misleading, one patient being deemed "operable" by both formulae 15 minutes before death. Might I suggest, therefore, that it is unwise to put these so-called tests and indices before clinical observation and experience.

It is not always realized that there is no such thing as a patient who is "so ill that he cannot stand the anaesthetic." Any patient with cardiac failure who is not *in articulo mortis* will improve temporarily under an inhalation anaesthesia, which begins with 100% oxygen in a closed circuit to which the anaesthetic agent is gradually added in minimal dosage. The question which so often faces the modern anaesthetist is not "Can this patient survive my anaesthetic?" but "Can I improve his general condition sufficiently to enable him to withstand the surgical trauma and to live long enough to benefit by the effects of the operation?" If the answer is not a reasonably certain "Yes," surgical interference is surely unjustifiable.—I am, etc.,

St. Albans, Herts.

C. LANGTON HEWER.

#### The "Surgical" Heart

SIR,—In his article in your issue of Dec. 25 Mr. Harold Dodd states that the Moots-McKesson "cardiac index" meets with some scepticism because it is seldom taught. It seems possible, however, that its unpopularity is based on a natural distrust of any formula which seeks to reduce a complicated problem to a simple rule-of-thumb. Measurement of the arterial blood pressure cannot reasonably be expected to replace the need for an accurate cardiac diagnosis, even for surgical purposes.

It is common to find a normal cardiac index although gross cardiovascular disease is present; this is so in many cases of coronary arterial disease (including not a few cases of recent coronary thrombosis), in most mitral lesions, in cardio-aortic syphilis without aortic incompetence but with or without aneurysmal dilatation (which may be on the point of rupture), and in the majority of cases of congenital heart disease (possibly with bacterial endocarditis). It would not be justifiable to consider all such cases fit for operation because the cardiac index was normal. On the other hand, a common cause of a high cardiac index is the rise of systolic pressure which so often occurs during examination, and this is, of course, not a contraindication to operation. On the basis of the cardiac index alone a large proportion of cases of thyrotoxicosis would be regarded as unsuitable for operation. Patients with aortic incompetence, aortic stenosis, patent ductus arteriosus, or peripheral arteriosclerosis should not be regarded as unfit for operation solely on account of the abnormal relationship of systolic and diastolic arterial pressures.

No one could take exception to the suggestion that the blood pressure should be taken as a routine before operation, but this should surely be regarded as one item in the routine pre-operative examination of *all* systems and not as replacing the "clinical examination of the heart and pulse."—I am, etc.,

A. MORGAN JONES.

Cardiographic Department, Manchester Royal Infirmary.

#### Digitalis a Cardiac Tonic?

SIR,—I have read with interest Mr. Harold Dodd's article on blood pressure and the cardiac index. I must protest at his inclusion of digitalis as a "cardiac tonic." It is well known that digitalis is a cardiac poison, and it is to the effect on the conductivity of the neuromuscular tissues that its therapeutic action in auricular fibrillation is due. Linnell and Thomson (Nov. 6, p. 573) have indicated its uselessness in many other forms of cardiovascular defect.—I am, etc.,

Seascale.

L. GOLDMAN.

#### Treatment of Facial Palsy

SIR,—In his letter to the *Journal* of Dec. 25 Dr. Wilfred Harris has taken the statement, "The test for faradic excitability does not provide any useful information in forming a prognosis," apart from the context and has expressed his disagreement. The statement is not given as the opinion of the annotator but is the conclusion reached by Dr. Karsten Kettel from his investigation of the late results in 264 cases of facial palsy, and it is therefore fair to give his reason for reaching this conclusion. He says:

"In half my cases the paralysis was partial and the faradic test presumably positive, even if in a greatly lowered degree. Since the final result in half the cases of partial paralysis—that is, one-fourth of the total number in this group—was nevertheless bad, it is obvious that the faradic test cannot be a reliable indicator. It is possible that a completely negative test may provide a hint. The fact that the faradic excitability is only reduced does not permit any prognostic conclusion."

On the other hand, the long experience of so distinguished a neurologist as Dr. Wilfred Harris is conclusive. It seems, however, that Dr. Harris refers to cases of Bell's palsy without middle-ear disease, whereas the cases followed up by Dr. Kettel were all secondary either to middle-ear disease or to operative treatment for its relief, and consequently were cases with a greater or less degree of pathological change in the temporal bone as well as in the nerve itself. This may perhaps explain the discrepancy between the observations of Dr. Harris and of Dr. Kettel, and it would no doubt be of interest to your readers to know if this explanation commends itself to Dr. Harris.—I am, etc.,

YOUR ANNOTATOR.

#### Blast Perforation of Ear-drums

SIR,—In the *Journal* of Aug. 21, 1943 (p. 233), Capt. G. W. Palmer reports his findings in 60 cases showing blast perforation of the ear-drum, and concludes that the proportion of infection to be expected is 35 to 40%, "under the most ideal conditions." Some months ago I had the opportunity of examining a similar, though smaller, group of cases, when ten men were admitted to a military hospital following an

explosion in a confined space. Their ears were examined on the day after the occurrence; in all, there were 15 perforated drums, only one having no perforation. In 50 the perforation was in the antero-inferior quadrant, one case showing an anterior and a posterior perforation on both sides. In nine ears there was wax and or blood-clot, and this was carefully removed with Johnson's wax scoop. No ear was syringed, either at the time or later, and no local treatment of any sort employed, except that a piece of sterile cotton-wool was placed in the cone. All cases received chemotherapy for their associated injuries.

No case became infected up to ten days after injury, when the majority of the patients were evacuated. One ear showed a slight blood-stained discharge coming from a piece of blood-clot in the tympanum, which was difficult to remove, but cleared up in four days. One man with a large dry perforation infected the ear through taking a shower bath two weeks after his injury; the infection was a severe one, and a cortical mastoidectomy was eventually necessary. It has been my experience that a higher proportion of surgical mastoiditis is found in infected "blast" ears than in cases of ordinary otitis media.

In my opinion, if local treatment is restricted to the early removal of wax, blood, and debris, a lower infection rate than that given by Capt. Palmer can be expected.—I am, etc.,

B. S. CARTER,  
T. Major, R.A.M.C.

### Tonsillectomy in Children

SIR.—Though wholeheartedly in favour of leaving tonsils in unless there are very definite local indications for their removal, I am sorry to see that your annotation of Sept. 11 (p. 334) accepts statements such as the following: "The sickness experience of the tonsillectomized group was no better than that of children in whom there had been no operation." I beg to point out that there are some serious fallacies in such a conclusion.

1. Tonsillectomy is very frequently incomplete. Some of the largest and most septic tonsils are to be found in children who have had their tonsils "removed." Many studies, therefore, merely compare the health of children whose tonsils were never removed with that of children who, in spite of operation, still have septic tonsils.

2. It is obvious that in the tonsillectomized group there must have been some sort of reason for the operation, such as recurrent colds or coughs. It is a fair assumption that in a high proportion of the non-tonsillectomized group there was no such condition. It is therefore meaningless to compare the health of one group after the operation with that of another, more healthy, group which had no operation.

3. Sinus infection is very frequently the cause of the symptoms for which the tonsillectomy is (wrongly) advised. The symptoms and effects of sinus infection are not relieved by tonsillectomy. Studies of the effect of tonsillectomy without the elimination of a possible sinus infection are valueless.

4. Important causes of the apparent failure of the operation are: (a) persistence of haemolytic streptococcal infection in the throat, shown by Kaiser and others to be common; and (b) a common complication of tonsillectomy—infection of the nasal sinuses. Studies of the subsequent health of tonsillectomized children, with very few exceptions, do not take these factors into account.

The many large-scale studies which I have read are as fallacious to my mind as would be the comparison of the health of a group of patients who had had no stomach operation with that of a group which had had an unspecified operation on the stomach for unspecified symptoms and disease, with unspecified complications and associated infections, and without mention of the completeness or otherwise of the removal of gastric or malignant tissue. What is required is a large-scale study of the health of children who, having no pre-existing or complicating sinus infection, have had, for specified conditions such as nephritis or recurrent colds, a tonsillectomy completely and correctly performed, with elimination of the pre-existing infection, as compared with the health of a similar group of children who, with the same condition, chose to keep the tonsils in and rely on medical and general treatment only. I look forward to seeing such a study.

In addition, it would be interesting to compare the disease experience of children who have had an unsuccessful tonsillectomy, which has failed for the reasons mentioned, with that of children in which the operation was "successful." A mere investigation of the frequency of disease before and after tonsillectomy is fallacious for another reason—the fact that the child is older after tonsillectomy than before it, with all that implies in altered environmental and other conditions.

I regret that the value of a recent paper of mine (*Lancet*, 1939, 2, 1013) on the role of tonsillectomy in nephritis was negated by these very fallacies.—I am, etc.,

R. S. ILLINGWORTH.

### Mastoiditis in Infants

SIR.—I note in Dr. P. W. Leathart's article on a common cause of diarrhoea, vomiting, and dehydration in infants (Aug. 7, 1943, p. 168) the following statement: "We may conclude, therefore, that mastoiditis is commonly caused by milk, vomit, or infected mucus entering the Eustachian tube in children who are either too young or too ill to sit up, and are accordingly nursed and perhaps fed while lying on their backs." In five years' busy practice in this area, containing 50,000 people who treat their young and sick children as described, I have not seen one case of acute mastoiditis. Possibly one case a year occurs for the whole city and surrounding district. I conclude, therefore, that some additional factor is required in young and sick children.—I am, etc.,

Rockhampton, Queensland, Australia

R. PALMERSTON RUNDLE.

### The Psychological Approach to Illness

SIR.—It is regrettable that there is such a gulf between the skilled psychotherapist and his medical colleagues, and that the general principles of the psychological approach to illness are not more widely taught. The proportion of medical psychologists to the rest of the profession is very small indeed—far too small to deal with the cases that should be referred to them. But before patients can be sent to the psychologist they must be recognized as suitable cases, so that some knowledge of psychology is essential to surgeon, physician, and general practitioner alike. How many deflected septa and appendices would be left alone; how many "cardiacs" would live a full life; how many gastritis, headache, lumbago, and colitis cases would be recognized for what they really are, if this outlook were more general? Many cases of neurosis can be greatly helped without any elaborate knowledge of psychotherapy, and many patients can be prevented from developing neurosis by early explanation and guidance. Here is the G.P.'s opportunity and duty.

A simple example of this, but in my opinion a very important one, is in ensuring the right attitude of the "toddler" to his new baby brother or sister. Many parents are so stupid that without definite guidance they switch all their affection and interest to the new arrival, leaving the elder child, previously the centre of interest, lonely and forsaken. It is hard to estimate just how much harm this may do, but it is certain that the personality may be permanently affected and an anti-social reaction developed. The elder child, craving attention, may feign illness, develop enuresis, or even attempt secretly to injure the "usurper." Later on antagonism between the members of a family may persist long after the reason for it has ceased to exist. It is remarkable to know that all this may be prevented by instructing the parents how to behave to the elder child by making him a "partner" in the new baby, encouraging him to help with baby's toilet, and above all by giving him extra affection and attention. All this may seem ridiculously obvious, but how often do we do it?

From Servicemen who come to see me when on sick leave it is obvious that many cases of neurosis are unrecognized and labelled as some "itis" or other. I have recently seen two pilots who were both, as a result of their experiences, just plain scared of flying. After careful questioning they both admitted that that was their whole trouble. But had they been referred to a psychologist? No; both had been in and out of hospital for months, one labelled "chronic catarrh and sinusitis" and the other "bronchial catarrh." A sailor who was suffering from home-sickness was kept in bed for weeks with a diagnosis of "myocardial weakness." I knew the man and referred him to a cardiologist, who reported that his heart

was perfectly normal. Needless to say, such treatment does not cure the neurosis, but leads the sufferer on the way to permanent invalidism.

Have we not all at some time been guilty of accentuating and fixing a neurosis by taking the symptoms at their face value and treating them as organic? One of the worst examples of this I have seen, because it should have been so obvious, was a case of aphonia. The patient, a young woman, had suddenly found that she could speak only in a whisper. The trouble was diagnosed as laryngitis, and her tonsils were removed. She still whispered, so all her teeth followed! I saw her when she had whispered for two years, and under light hypnosis she recovered her normal voice in twenty minutes.

Failure to recognize the psychological nature of certain complaints may lead to elaborate research reaching erroneous conclusions. I have in mind various work done on the problem of enuresis. Enuresis is usually psychological in origin. I saw a girl of 20 some months ago who was living at home and wetting the bed every night. I advised her to join the Services, which she did reluctantly, fearing to disgrace herself. I saw her recently. She is well and happy and the enuresis ceased from the time she left home. Yet we still read articles describing experiments with this and that drug, comparing results with different techniques. But when good results are obtained they are due to the suggestion of cure given by the doctor. Hence the wide divergences of results as shown by the statistics of different workers.

What I plead for, as a humble general practitioner, is a wider teaching of the psychological outlook, so that we may not encourage neurosis but help to eliminate it. A few lectures given as part of the degree course by a psychiatrist whose job is to deal with the pathological mental case are not enough. What is needed is teaching by a psychotherapist burning with zeal for his subject. How well I remember, twenty years ago, attending a course of lectures at Birmingham University given by real enthusiasts, including Hadfield, Bernard Hart, and Crichton-Miller. The whole subject is so absorbingly interesting that if presented properly the student could not fail to learn. Could not one of the outstanding men with a gift for lecturing tour the universities and so revolutionize the outlook of the student? This is not just another subject to be crammed into the medical curriculum, but a question of giving the next generation of doctors a more balanced outlook on medicine and a wider understanding of their patients as individuals rather than as cases.—I am, etc.,

Halesowen, Worcs.

HERBERT W. BLAND.

### Shock Treatment of Mental Disorder

SIR.—In the *Journal* for Dec. 25 (p. 829) Dr. Winnicott invites discussion upon the shock treatment of mental disorder. He writes a curious letter. Indeed, if it were not for the fact that he is himself a leading exponent of Freudian doctrine, one would be tempted to suggest that the treatment in question had aroused his own unconscious hostility. If anyone was so ill advised as to voice his objections in such emotional terms to recent psycho-analytical theories, he would no doubt be referred sternly to the ascertained facts, and told that his own unconscious mind was distorting his powers of observation.

In Dr. Winnicott's eyes we must be very guilty indeed. At this hospital we have been using electrical shock therapy for 2½ years. During this period we have treated a large number of patients, mostly suffering from comparatively mild and recoverable illnesses. Our experience has taught us that the treatment is of unequalled value for cases of depression of psychotic type. Dr. Winnicott speaks of the value of recent researches in psychology, yet we ourselves have no knowledge of any other form of treatment which would cut short this disorder. Despite its recoverable nature, the duration of the attack may be exceedingly long, and our ability to terminate it quickly by shock therapy has taken a load off our shoulders, which does much to overcome our natural dislike of the method.

We have not abandoned psychotherapy; indeed, the rapid removal of the state of acute depression, during which analytical psychotherapy is largely contraindicated, has given us more time for treatment when the basic mood disturbance has been overcome.

We have used the treatment cautiously and in an experimental frame of mind in certain other types of illness. We are not at all impressed with its efficiency in exogenous anxiety states, or, indeed, in any condition in which the mood disturbance is not a fundamental feature of the illness. Far from enabling us to do our work "without having to know anything about human nature," we have found that differential diagnosis assumes a new importance. The problem of distinguishing between an essential mood disorder (an affective psychosis) and a mood disorder which is secondary to the patient's immediate preoccupations (an affective neurosis) can be very difficult indeed. For many it was once a distinction without a difference; now a correct diagnosis may lead to the rapid relief of symptoms by shock therapy in the psychosis, whereas in the neurosis this treatment is likely to make confusion worse confounded. It should be added that there are many cases in which a psychotic depression is grafted on to an underlying neurosis. In such cases the need for psychotherapy after the conclusion of shock therapy is obvious, but we believe that it is no less important in the more straightforward depressions.

We hope very shortly to have the privilege of publishing a series of cases of "mild" and recoverable disorders which have been treated at the hospital. We believe that our results have been excellent and our complications few. We welcome the introduction of a method of physical therapy which is so dramatically restorative. We believe that it represents one of the greatest milestones in the history of psychiatric treatment, and we hope that it will lead to a new understanding of the physiological processes underlying mental disorder. In fact altogether we think that Dr. Winnicott is giving a brave but rather futile imitation of King Canute.

Lastly, about the children whom Dr. Winnicott desires so earnestly to protect from this awful treatment: a moment's reflection should serve to reassure him, for as a good psychiatrist and paediatrician he will surely be aware that psychotic states of depression are exceedingly rare before puberty. As an additional point of reassurance it is noteworthy that electrical shock therapy causes the patient very little discomfort or anxiety.—We are, etc.,

C. H. ROGERSON,  
B. ANDRATSCHKE.

The Cresset Hospital for Functional  
Nervous Disorders.

SIR.—The advocates of shock therapy are likely to react to Dr. Winnicott's seathing indictment with angry protests. But Dr. Winnicott is fundamentally right. One may go further and ask whether some of our psychiatrists are not barking up the wrong tree. Spontaneous recoveries from mental illness are not unknown, and for this reason many methods of treatment which have not produced a higher percentage of cures than no treatment at all might very well be discarded without more ado. Their success cannot be ascribed to any inherent virtue of the method. Yet some mental hospitals still advocate these methods merely because they happen to be fashionable.

Any treatment which does not "cure" as many patients as no treatment at all in the same period of time is doing definite harm. It is drawing wool over the eyes of a long-suffering public. Treatment of mental disorder by the induction of fits is indeed "a wonderful way of doing psychiatry without having to know anything about human nature." If it really is "a by-pass to true understanding of human nature," then its indiscriminate use is to be deplored. It is a fact, as Prof. Ryle states (Nov. 20), that the sciences and techniques have come to dominate medicine to the exclusion of the most important science of all—the technique of understanding. "Science without humanism may work with atoms, but it will not work with men."

The danger in the present widespread use of artificially induced fits as treatment of mental illness is that a potent therapeutic agent is put into the hands of practitioners who often have little understanding of psychotherapy and still less knowledge of human nature. As a safeguard I would suggest that the use of shock therapy should be restricted to patients who are inaccessible to other forms of treatment, that it should be followed in all cases by psychotherapy, and, most important of all, that shock treatment should be given only by practitioners who have had extensive experience of psychotherapy.—I am, etc.,

Wimborne.

J. STEPHEN HORSLEY.



## Population Problems of India

SIR.—Prof. Blacklock (Dec. 25, p. 805) gives a dismal future for India. He concludes that, given all the advantages that modern knowledge can give "to the betterment of the health of man by attention to the prevention of disease and to improving housing, environment, and nutrition, then India... will be so rapidly populated that starvation will inevitably result, and that soon." Before accepting this Malthusian prognostication and its implications there are certain facts about the productivity and population of India which should be considered.

Owing to the methods of agriculture the soil of India, which is not a poor one, is yielding less and less. Manure is used as fuel and straw as cattle fodder instead of manuring the land. Owing to primitive methods and the small average area per cultivator the yield per acre is low and the labour wastage is very high. "More than one-third of the existing cultivable area in India has not yet been brought into cultivation, and the existing cultivated area is cultivated under such restricted primitive conditions as to result in a yield per acre about one-third of that obtained for a similar crop (comparing wheat yields), with less man-power, in the United Kingdom" (P. Dutt in *India To-day*).

## Agricultural Area of British India, 1935-6

	Millions of Acres
Net area by professional survey .. .. .	667.4
Area under forest .. .. .	89.5
Not available for cultivation .. .. .	145.0
Cultivable waste other than fallow .. .. .	153.6
Fallow land .. .. .	51.0
Net area sown with crops .. .. .	227.9

(Statistical abstract for British India, 1946)

Even under these conditions India is producing enough food to give 88% of its existing population a daily ration of 2,800 calories per head if none was exported and there was no maldistribution (Prof. Mukerjee, *Food Planning for Four Hundred Millions*, 1938). But if all the advantages of civilization envisaged by Prof. Blacklock were applied to India's agriculture we see that the country could produce nearly four and a half times as much food, which should be sufficient for a population three times that of present-day India.

As human knowledge advances the productivity of the world will increase; the recent reports published in the *Journal* on the production of protein by the use of yeast are an indication of what we can look forward to. The increase of population in India may well result in a more thickly populated India, but there are many other countries which are more densely populated, including England and Wales. The birth rate in India is apparently declining; in the decade 1901-10 it was 38, in the decade 1921-30 it was 35, and the average rate for the 5-year period 1934-8 was 34.5.—I am, etc.,

M. BARROW.

Birmingham.

SIR.—In his gloomy forebodings Prof. D. B. Blacklock (Dec. 25, p. 805) having enlisted the services of pessimist Malthus, I feel constrained to reply by invoking the aid of optimist Doubleday.

Doubleday was a very worthy citizen of the city from which I write, and in *The Natural History of Population* Raymond Pearl (surely an acceptable sponsor on such a matter) says of him: "Doubleday's book, now largely forgotten and almost never read, contains with all its errors of judgment some acute observations and reasoning." The pith of Doubleday's theory, which appeared in his *The Law of Population* in 1842, is, in his own words, that "overfeeding checks increase, whilst on the other hand a limited or deficient nutriment stimulates and adds to it." In essence he seeks to establish the existence of a natural self-adjusting and variable fertility potential in the human race, and though clearly nobody would set out to claim that this theory is the whole truth, it is, at the same time, not one wholly to be dismissed. Raymond Pearl, for example, draws attention to researches of Sydenstricker's on the high expressed fertility of those on the dote, which lend colour to Doubleday's observations.

Some association between the standard of living and potential fertility such as Doubleday describes would, in due course, mitigate the miseries which Prof. Blacklock fears may arise out of the Atlantic Charter, and would render it an experiment worth pursuing.—I am, etc.,

IAN E. MCCracken.

Newcastle-upon-Tyne.

SIR.—You are to be congratulated on the publication of an extremely valuable and important article on the population problem in India. It is good to know that the pages of the *British Medical Journal* are available for such sound thinking. One point only calls for comment. Toward the conclusion the author says: "To what extent, if any, the frequent use of chemical or mechanical contraceptives finally impairs health is as yet by no means certain." Records at our clinic have not been accumulating for twenty-two years, and it is quite certain that though some mechanical and chemical contraceptives do have a detrimental effect on health, yet the perfectly safe occlusive method combined with a bland suppository for women need cause no anxiety, for they cause no harm.—I am, etc.,

MARIE C. STOPES,  
Founder of the Mothers' Clinics.

## Artificial Insemination

SIR.—Many will endorse Dr. Todhunter's courteous and timely warning (Jan. 1, p. 25) about the discussion of the pros and cons of artificial insemination. He stresses the importance of wise and true teaching and advice so far as our present knowledge takes us.

I suggest that our sins of omission are as great and far-reaching as any active false teaching, and that a brake should be applied to the development by Press comment, advertisement, radio, etc., of the increasingly prevalent idea that the medical profession has become so clever that a physical Utopia is just round the corner. We shall be blamed and seriously discounted in our efforts when the public become disillusioned, unless, meanwhile, we actively avoid any such claim to infallibility and combat false ideas already taking root.

So much excellent research has been done and is in progress that the average doctor is so busy keeping in touch with the newest therapeutic agent, with so many per cent. of indications and cures, that he tends to forget the fundamentals of anatomy, physiology, pathology, and psychology, all of which change only very little and very slowly. The reproductive function is the most important and the most mysterious in human experience. The essential basis of civilization lies in the control of intrasexual physical relationships. Therefore it becomes of extreme importance, when civilization is so precariously balanced, that the medical profession must not allow false teaching to go unanswering.

In recent years much preventable psychological uncertainty and distress have been caused by such ideas as (a) sterility is curable by hormones, vitamins, etc., if only the correct combination is used; (b) that no woman's life or even health should ever be in jeopardy in pregnancy or childbirth; (c) that the converse of contraception is true—i.e., that a woman can have a baby at will—to take easy examples. Perhaps that last, of all the many false notions prevalent now, causes the greatest social and psychological trauma. Nearly all young people to-day marry honestly believing that contraception for the number of years necessary to establish a material and social position is the wise and enlightened procedure. They are greatly surprised, confused, and hurt when the proposed baby does not materialize. Even at that stage they are allowed to believe that medical science can put matters right. Only sometimes is this true, and even when all means are used it remains for Nature, Providence, God, or what name you choose, to perform the miracle of conception. How much better it would be to acknowledge our fundamental ignorance, and to advise young people to marry honestly and generously to make love, and to welcome gratefully the miraculous result! Then and only then, after the family is established, should any question of contraception be considered.

It behoves us, if we are to maintain our position as an intelligent profession, to retrace our steps a little, to accept all experimental advances only in relation to our essential bases of knowledge, and to avoid the arrogance of partial knowledge so dreadfully suggestive of Continental doctrines and of quackery.—I am, etc.,

Birmingham.

J. S. M. CONNELL.

SIR.—I see no more objection to artificial insemination with the husband's semen than assisting the child into the world



with forceps. But when it comes to using "donated" semen, another question arises: What will be the status of the child? If the husband gives his name as the father he will be liable to prosecution, and if the real father's name be given or the name be omitted the child will be labelled a bastard.—I am, etc.,

Birmingham.

ROBERT ANDERSON.

### Consciousness in Senescence

SIR,—I have read with great interest the paper by Prof. Jefferson on the nature of concussion and your editorial on the place of consciousness (Jan. 1). I note that no reference has been made to the anatomical and physiological changes that occur in the course of senile degeneration, but the close resemblance between the manifestations of this condition and those of concussion and of cerebral lesions generally would appear to make this a very valuable field of comparative inquiry. The fitful gleams of consciousness alternating with an almost stuporous condition which occur in advanced senility, the sudden falling asleep, the disorientation, the defective ideation, and the narrowed field of consciousness are similar in old age and in traumatic cerebral conditions.

Senescence is regarded as due to an arteriopathy, and the variability of the symptoms from day to day and from hour to hour is undoubtedly due to the fact that different elements of the brain receive a different amount of blood supply from time to time. It is obvious that all levels of cerebral function are affected, from those that are associated with the higher centres, which are considered to be situated in the cortex, to the more elemental functions, which are regarded as emanating from the hypothalamic regions and the brain-stem.

From the cases of senescence which I have personally observed, my own impressions are that consciousness, in the widest sense of the term, is an extremely complicated function dependent on the integrity of the brain as a whole.—I am, etc.,

London, W.1.

DORIS ODUM.

### The Nature of Concussion

SIR,—In his article Prof. Jefferson concludes that a paralytic effect upon the neurons is the prime cause, but it is not at all clear how this primary paralytic effect can be produced by the small subcortical focal lesions which he gives as examples causing stupor, nor how it is related to the stupor-recovery-stupor sequence which he knows holds the key to the problem.

Since I have shown that the function of the frog's peripheral nerve is unaltered by stretching or compression within reasonably wide limits, and Echlin has shown that slight stretching is an adequate stimulus to cause cerebral capillary constrictions, it seems more probable that the primary effect of tissue distortion by concussion, blast, or small focal lesions with surrounding oedema, is a capillary stretching and constriction. I have discussed (*B.M.J.*, 1938, 1, 265) how patterns of capillary flow within brain tissue can influence group neuron function, and said that a normal change of pattern is allied to change of mental and emotional phenomena, so that a primary constriction of certain cerebral capillaries due to stretch, and a secondary paralysis of neuron function from capillary anaemia, elucidate the problems of stupor from subcortical lesions, and of the neurological and mental effects of concussion.—I am, etc.,

Birmingham.

F. A. PICKWORTH.

### Teaching of Anaesthetics

SIR,—Dr. K. G. Lloyd-Williams's letter (Dec. 25, p. 827) is both timely and welcome. Although not in agreement with it all, I most whole-heartedly agree with the urgency of a complete revision of both the teaching and the practical administration of anaesthetics. Realizing early in my career how anaesthesia can either make or mar a surgeon's best efforts, I saw that advances in surgery were difficult and hazardous if they were not supported by adequate advances in anaesthesia. After visiting many of the bigger Continental clinics over the years, it became more and more obvious that inhalation methods of anaesthesia were increasingly giving way to basal narcosis combined with peripheral infiltration, and

other better and safer methods for the bigger surgical enterprises.

After giving most methods a prolonged trial—and these included all types of inhalation, spinal, paravertebral block, the barbiturates, etc.—I adopted a combination of tribromethyl alcohol and peripheral infiltration with "planocaine," and have used this for years for operations of all magnitudes, including the severest types of emergency, with results that are incomparable with any other method I have seen. For intra-abdominal work splanchnic or mesenteric block is used in addition. This combination, or improvements on it, have come to stay, and, though nearing the autumn of my years, I forecast appointments of "surgeon-anaesthetists" at our larger clinics. Let, then, the training of the anaesthetist of the future begin in the anatomy and applied physiology departments, where he or she will acquire a more accurate knowledge of the anatomy of the cutaneous sensory and splanchnic nervous systems, and a more thorough appreciation of such a vast subject as the applied physiology of shock.—I am, etc.,

Ballidon, Yorks.

BASIL HUGHES.

### Medical Boarding for the Merchant Navy

SIR,—In recent months various letters under this heading have appeared in the *Journal*. Mr. Greany, the secretary of the Shipping Federation (Oct. 2, p. 435), indicated that the question of medical arrangements in the Merchant Navy was too lengthy and complex to be dealt with in correspondence columns, and at the same time corrected some misstatements of fact which had appeared in some of the letters.

As one who has been connected with the medical aspects of seafaring for nearly thirty years, I would like to emphasize that the Shipping Federation, the shipping companies, the Ministry of War Transport, and the various unions connected with the Merchant Navy are fully alive to the many problems about the fitness of seamen, and that the particular difficulties which have arisen owing to wartime conditions have not escaped their notice. They are all giving much attention to them, and there is active co-operation between these bodies to this end.

Dr. Royds Jones (Dec. 25, p. 831) rightly states that there has been little trouble with the regular pre-war seafaring man. The difficulties are more with those directed back to seafaring by the Ministry of Labour and those who have started seafaring since the outbreak of war. Many of the "old hands" might not have reached Grade I or II standard of the armed Forces medical boards had they been before such boards, but they have been on voyage after voyage, serving magnificently, and doing their jobs efficiently without complaint, frequently in spite of advanced age and some physical defects. Only recently I examined a boatswain who had been at sea for over fifty years, the last forty-three years with one shipping company, and thirty-five years in his last ship, only retiring at the age of 71 after an accident that was no fault of his years and which would have incapacitated a man thirty years younger. Without any hesitation I would rather trust the judgment of the Shipping Federation medical examiners and the medical officers of the various shipping companies as to the fitness or otherwise of seafaring men than the findings of the average armed Forces medical board.

Dr. Royds Jones suggests medical history cards for every man. These were started last September, and there is now a record card for each man as soon as he enters the Reserve Pool, and part of it is devoted to medical history. The findings of all examining doctors are entered on the card, and entries are also made in respect of general practitioners' certificates, hospital reports, etc. By this means a check can now be kept on those who try to "go sick" too frequently or at inconvenient times just before a ship is due to leave United Kingdom waters, and we can now take steps to prevent recurrence of some of the troubles that have existed in the past, though the malingerer or shirker will always be a difficult problem, as for obvious reasons the same action cannot be taken in the Merchant Navy as in the fighting Services, where the men are supervised and controlled whether at work or not.

Medical certificates of unfitness from general practitioners when the man is ashore are often a difficulty and do complicate the work of the Shipping Federation and shipping companies' medical officers. Under the Reserve Pool arrangements,

however, all such seamen must submit, if required, to an examination by a Reserve Pool doctor, who can, if necessary, obtain a second opinion or refer the case to the medical referee appointed by the Ministry of War Transport.

It is impossible to go into all the details of medical arrangements concerning the Merchant Navy in a letter which could be published. There are difficulties to be overcome and there are defects which are not denied, but it is quite wrong, as some of the letters have suggested, to think that those responsible are doing little or nothing about it. The whole question is constantly under review and active steps are being taken to overcome the difficulties and remedy the defects.—I am, etc.,

E. L. CALDWELL-SMITH.

Chief Medical Officer, the Shipping Federation and  
Merchant Navy Reserve Pool.

London, E.C.3.

### Colonial Research

SIR.—The demand for research and ever more research raises the questions, "Have results justified the large sums already expended?" and "Is research organized on the right lines?" Looking back on the chief achievements in research into tropical diseases, one is struck by the fact that it was the ordinary doctor, often working single-handed and engaged in medical work, who made the outstanding contributions. Ranson, busily engaged in practice in China, discovered the role of the mosquito in filariasis; Ross, as a young I.M.S. officer in India, that of the mosquito in malaria; Forde, a medical officer on the West Coast, discovered the trypanosome of "negro lethargy"; Stannus minutely described pellagra, a disease then hardly known to English doctors, among the inmates of a gaol in Nyasaland, and discredited the maize causation theory—a discovery which has led to recognition of the disease in many parts of Africa and the U.S.A. and has stimulated much work on deficiency disease.

All these men were busily engaged in their general professional work. The true research worker is very much of an individual; his gifts seldom fructify in the atmosphere of a large fellowship. Research of this individual character, which, as Ross has recounted, often enough received little encouragement, has, I venture to say, been far more fruitful than that of large commissions, and infinitely less costly.

Nowadays the multiplicity of duties inflicted on the successors of these men almost debars reflection on what they have observed at the bedside or in the post-mortem room. They are overwhelmed by report-making, clerical duties, examinations of labourers, of officials of all races on appointment, on going on leave, on postponing of leave, by medical boards, the examination of school-children of all races, court cases, as well as by the expanding work of hospitals. I speak from recent experience in Tanganyika, where much military work also, at the moment, falls upon them.

I suggest that in the medical field far more will result from increasing the staff of district medical officers and lightening their burden of work than from appointing organized bodies of workers who are not in intimate contact with the sick. Help from specialists is, of course, required from time to time and should be obtainable from a central laboratory, and there will always be questions requiring team work for their solution. But it should be possible to relieve a man who has initiated a promising investigation from much of his general work.

The opportunity for individual research was one of the main attractions of the Colonial Medical Service. This attraction hardly exists to-day.—I am, etc.,

J. B. DAVEY

(Formerly F.M.O., Tanganyika).

Bournemouth.

### Hospital Diets

SIR.—Referring to your previous correspondence on inadequate hospital diets, may I record the case of a Service patient admitted to this hospital recently from an R.A.F. hospital, which I shall leave unnamed, who had been under treatment for pulmonary tuberculosis and diabetes mellitus. He brought with him a diet sheet, a copy of which, for the purpose of refreshing and possibly tantalizing the memories of some of your readers, I append.

To counteract these daily spreads he was given 80 units of insulin. A few days on normal hospital diet—and the diet here is considered to be better than average, even by the

1st Day	2nd Day	3rd Day	4th Day	5th Day
<b>Breakfast</b>				
Bacon and egg, toast and butter	Porridge, bacon, toast and butter	Scrambled egg and bacon, toast and butter	Porridge, fish or salmon (salmon and egg to bind), toast and butter	Liver and bacon or egg and bacon, toast and butter

Lunch break: milk, half a pint, with biscuit

<b>Lunch</b>				
Steak or minced beef, potatoes, cauliflower, stewed apples, cornflour sauce	Mutton mulligatawny, peas, stewed peaches	Chicken, potatoes, green vegetables, apple or prune tart	Beef stew, onions and carrots, tinned peas, potatoes and green vegetables, stewed fruit	Fish, potatoes, green vegetables, rice pudding and milk

<b>Tea</b>				
Sardines, bread and butter, salad, tea	Boiled or poached egg, bread and butter, salad	Salmon, salad, bread and butter	Cheese salad, bread and butter	Cold meat or ham or tongue, bread and butter, salad

<b>Dinner</b>				
Chicken or liver or lean pork, potatoes, peas, green vegetables, stewed apricots or prunes	Steamed or grilled fish, potatoes and green vegetables, Welsh rabbit	Grilled steak, onions, baked potatoes, bread-and-butter pudding	Mutton, potatoes, green vegetables, rice pudding and baked apple	Savoury mince, potatoes, carrots, fruit tart

13 oz. milk and two biscuits and butter every evening.

present patients—and his daily insulin requirements were reduced to 25 units, resulting not only in a saving of insulin but a feeling of repletion after meals, and the comforting knowledge that upon discharge he will be able to obtain, and pay for, the commodities which now figure in his diet.

Perhaps there is something to be said for bad diets.—I am, etc.,

R. LIVINGSTONE,  
Medical Superintendent.

Kettwell Hospital, Swanley, Kent.

### Effect of Pregnancy and Parturition on Pulmonary Tuberculosis

SIR.—In view of the increased incidence of pulmonary tuberculosis in recent years, Dr. R. C. Cohen does well to call attention in the *Journal* of Dec. 18 (p. 775) to the effect of pregnancy and parturition on pulmonary tuberculosis. His results and conclusions in those cases in which the disease is quiescent or arrested are in accordance with the views of most tuberculosis workers, but in those cases in which there is clinical or radiological evidence of active disease his conclusion that "active pulmonary disease is seldom accelerated by pregnancy and labour" is at variance with both generally accepted beliefs and the results of his own investigation. Dr. Cohen finds that out of twenty-five such cases no fewer than seven showed retrogression of the pulmonary disease, and in only two out of these seven cases was subsequent improvement noted. He does not give details of the twenty-five cases, which he has included under the heading "Progressive," and he makes no mention of having carried out any investigation of patients with similar pulmonary disease and who were not pregnant, but states that "there is no reason to assume that the disease in the former would not pursue its steady and relentless course."

It is well known that the Essex County Council Hospital, Black Notley, is an institution for early and treatable cases and not for cases of advanced disease; this being so, it would be very surprising indeed to find anything like such a high figure as 28% of their cases with active disease showing

evidence of retrogression while still undergoing sanatorium treatment. On the evidence which Dr. Cohen puts forward it would therefore seem that pregnancy and labour do in many cases have serious consequences; and his results would seem to show that in any case where a woman with active pulmonary tuberculosis is seen early in pregnancy the question of terminating the pregnancy should be very seriously considered indeed.—I am, etc.,

R. S. McDADIE,  
Deputy Medical Superintendent,  
Essex County Hospital, Chelmsford.

### Scabies

SIR.—The letters from Major Kenneth Mellanby (Dec. 18) and Dr. A. M. H. Gray (Dec. 25) following Dr. Henry MacCormac's article of Nov. 27 interested me. The City of Portsmouth instituted a central clinic for the treatment of scabies in January, 1942, and during that year treated some 5,400 cases and contacts (average, one contact to three definite cases). Great care was taken with the disinfection of bedding and clothing. In the spring of this year, following Major Mellanby's experiments, the M.O.H. decided to omit the disinfection of bedding and personal clothing. The number of cases treated this year seems likely to be some 550 fewer than in 1942.

Much of this reduction may be due to our keenness in roping in and treating contacts, but, on the other hand, omission of disinfection, if Dr. MacCormac is right, should tend to favour an increase. Actually I have had very few complaints that infestation was due to blankets (Home Guard, fire watchers, etc.), and on detailed investigation I have been unable to trace a single authenticated case. In one instance the culprit was indeed infested, but with lice. In another he was shown to be suffering from psoriasis, the diagnosis, of course, being made by the complainant. I am not suggesting that blankets never transmit scabies, but in view of the labour and petrol saved I agree with Major Mellanby that the disinfection by a public body could be omitted. In my opinion it is far more important to see that immediate contacts are treated, even when, as is usually the case, they show no visible signs of scabies. I despair when a contact brings along a certificate from his doctor: "I certify that none of this family shows signs of scabies."

Like Major Mellanby I find many cases showing dermatitis from the use of sulphur—usually forearms and front of thighs—with scabies elsewhere. Out of 3,641 cases (excluding contacts) treated in 1942 83 showed dermatitis due to sulphur or dettol. I take this as an argument against the home treatment of scabies. Very few patients are conscientious enough or can be trusted to treat themselves properly at home.

I may say that we use a 25% solution of benzyl benzoate made up by ourselves, with two coatings given at one attendance. Occasionally I find it necessary to give a second application.—I am, etc.,

ERNEST SHAND,  
Assistant Medical Officer of Health, Portsmouth.

### Medicine in Persia

SIR.—The formation at Teheran in September last of an Anglo-Iranian Medical Society is, as you well say (Dec. 25, p. 820), a "pleasant instance of the close relations between this country and Persia." It is, however, so far as British medicine is concerned, but the most recent instance of many over a century and a half. Doctors are nowhere more esteemed than in the country of Avicenna, and since fully qualified Persians have, so far, been few for its vast size and difficult communications, heavy responsibilities have fallen on their foreign colleagues. The story of the work in treating the sick, in public health, and in training hospital assistants, of medical officers in British and Indian Government employ, of C.M.S. (and American) missionaries, and of doctors of undertakings such as the oil company, cannot be told now. You may, however, allow me to add a postscript to your welcome to the new society. Even it had a modest forerunner that was also of British inception. This was the Teheran Medical Society. As in September, 1943, so in March, 1924, Persians, British, and Americans were at the inaugural meeting, and also a French surgeon, a German, and, strange

to say, a Japanese—the medical member of a visiting mission. Further, you name a link between the two events, for Dr. Habibi Adlé, president of the Iran Medical Society, was one of our original members. My theme leads me to add that, about the time in question, he gave up practice in Paris when, on the advice of two British medical officers who had been appointed to reorganize it, the Persian authorities nominated him the first radiologist to their hospital at Teheran. It is pleasant but no surprise to learn that his abilities have brought him high office, and that he is using it to support the new society.—I am, etc.,

A. R. NELIGAN  
(One-time Physician to the British Legation  
at Teheran).

Droitwich.

### Sulphathiazole Insufflations for Gonococcal Vaginitis

SIR.—I note with interest and appreciation Prof. O'Donel Browne's remarks on this method of treating gonococcal vaginitis and endocervicitis (Dec. 25, p. 816). This form of treatment is not new. Personally, I have used this method for a considerable time and must admit that my results in many cases are not "dramatic." Recurrences and drug-resistant cases are too common. I favour at present a short few-days treatment (oral as well as local), giving 5 g. sulphathiazole daily (divided 4-hourly) by the mouth with plenty of water, and vaginal insufflation once daily with approximately 2 to 3 g. around the external os and in the fornices. Close supervision is necessary.

Trichomonad infection coexistent with gonococcal infection is commonly found at the V.D. clinic. In such cases vaginal insufflations with "picragol" or with "acetarsol vaginal compound" powder or the nightly insertion of "S.V.C." tablet (stovarsol vaginal compound) are necessary long after sulphathiazole treatment has been stopped.

Many venerologists will have welcomed Prof. Browne's remarks on this form of treating gonococcal infections. The experiences and opinions of others would, I am sure, also be of value.—I am, etc.,

C. HAMILTON WILKIE,  
Director of V.D. Services, Leicester.

### The Septic Finger

SIR.—We have been following with extreme interest the correspondence on septic fingers. While we should like to reiterate Dr. Romer's well-conceived opinions, we find ourselves in disagreement with those of Dr. Bailey. We should like, therefore, to make the following comments:

1. Most of the fingers that we see are definitely "over-ripe" and less than 5% are at the stage of invasion.

2. We are extremely surprised that Dr. Bailey has not seen any cases with bone necrosis, and we should be very interested to hear if any radiographic investigations were made of suspected cases, as we have seen several in the last few months.

3. Although it is obviously desirable to reduce the number of out-patients, it is our experience that the majority of general practitioners have neither the time nor the facilities to treat these septic fingers after incision.

4. We would further point out that septic fingers rank high as a cause of loss of man-hours in war production and of permanent disability; thus the greatest possible care should be taken in their treatment.

5. We have found short-wave diathermy an excellent means of rapidly healing those cases of prolonged infection with or without early bone involvement.

It is possible that, being house officers in a hospital seeing only some 200 casualties a week, we have better opportunities than Dr. Bailey for continuing treatment of our septic fingers until they are completely healed.—We are, etc.,

M. V. P. THOMAS,  
LEONARD L. MISTLIN,  
CYRIL BORODA.

Watford.

### Physics and the Surgeon

SIR.—I read with great interest the Bradshaw Lecture by Mr. H. S. Souttar (Dec. 11, p. 737) on physics and the surgeon. He states: "The radiation of which I am speaking consists of ether waves transmitting energy across space." I think it only fair to point out that there may perhaps not be an ether of space but just space (or space-time of relativity). With the

advent of Einstein's relativity, it has often been said that ether has been abolished. Either merely is a convenient noun to describe the properties of space. It is often a convenient grammatical construction to have. If we persist in using the term ether, it should be understood as the subject of the verb "to undulate," and acts as this subject t. t. well. The term ether as understood by the old physicists is no longer believed by modern scientists.—I am, etc.

Public Health Department, Governor

G. E. DOUGLAS.

### Agents Provocateurs

SIR.—As there has been a good deal of controversy in connection with this case, it would be interesting to know what obligations (if any) the two doctors who saw the "patients" in the second instance were under as regards the doctor who first dealt with them. Both of these practitioners knew that the decoys had been certified by another doctor, with whose opinion they disagreed; they also knew, presumably, that their findings were likely to be the basis of an action for lax certification against the first doctor. The question which arises is, Were they under any obligation to communicate with him before proceedings were taken?

Considerable public interest has been taken in this case, the general opinion being that the accused doctor had a decidedly "raw deal" all round—I am, etc.

Lester.

E. J. O'SULLIVAN

## Obituary

### C. E. DOUGLAS, LL.D., M.D., F.R.C.S.Ed.

The death at St. Andrews of Charles Edward Douglas not only deprives the Scottish profession of one of its most respected and popular senior members but also robs both the medical charities of a highly valued supporter. After qualifying M.B. at Edinburgh University in 1877 he went on to the M.D. in 1881, the F.R.C.S.Ed. in 1898, and the D.P.H. in 1894. He

had been resident surgeon at the Royal Infirmary, Edinburgh, and assistant physician at Morningside Mental Hospital. An enthusiastic Volunteer, he served in the South African War and in the war of 1914-18, reached the rank of lieutenant-colonel in the R.A.M.C.(T.), and held the Volunteer and Territorial Decorations. He practised at Cupar in Fife for many years and was M.O.H. for the burgh. When the British Medical Association held its Annual Meeting in Melbourne in 1935, Douglas was soon the admired



doyen of the company; it was supposed that he reached the age of 80 during the outward journey, but this was clearly a mistake, as he had just not reached 88 at his death on Dec. 28, 1943. He was especially devoted to chess; and when he travelled home from Marseilles by air it was said that he spent the whole flight in the exercise of this pastime. His spare, almost shrivelled, form threw into relief the constant activity of his mind and body; and his instant popularity with both sexes and all ages was a wonderful tribute to his heart as well as to his head. Douglas was a vice-president of the Royal Medical Benevolent Fund. He was even more of a mainstay to Epsom College, of which he was also a vice-president, and an honorary local secretary over a period of very many years; his own subscription was kept alive for 50 years or more, and his collections from colleagues were further valuable evidence of his interest in education.

C. E. Douglas had long been a loyal B.M.A. man and did valuable work in his own neighbourhood, at the Scottish Office, and at headquarters in London. He was a member of the Central Council for 12 years, and of the Scottish Committee from 1923 to 1930 (chairman 1923-5); he represented his

Division at 13 Annual Meetings of the Association, and served on the Journal Committee, the Insurance Acts Committee, the Ethical Committee, the Charities Committee, and the Parliamentary Elections Committee, taking a particularly keen and active part in the work of the last two committees through a long period of years. He was also a member of the special committee set up by the Council to inquire into the causation of puerperal morbidity and mortality. At the Edinburgh Annual Meeting in 1929 he held office as vice-president of the Section of Obstetrics and Gynaecology. He had been president of the Life Branch in 1914, and in recognition of his long and distinguished service he was elected a vice-president of the B.M.A. in 1936.

On his retirement in 1927, when he celebrated the jubilee of his entry into general practice, Dr. Douglas received the honorary degree of LL.D. from Edinburgh University. He then made his home at St. Andrews, where he took a deep interest in the history of the town and in the administration of St. Andrews Episcopal Church; he was also a member of the Representative Council of the Scottish Episcopal Church. When he left Cupar a public ceremony was held in his honour, at which the Lord-Lieutenant of the County, Sir Ralph Anstruther, Bt., handed him a number of gifts from his many friends in Fife.

### Dr. S. WATSON-SMITH writes:

As the years roll by we have to part with one notable member of the profession after another. Now we lament the passing of Douglas of St. Andrews. He was born at Cannanore in South India, the son of Col. Walter Douglas of the Madras Staff Corps, being, when he reached school age, sent home to be educated at the Edinburgh Collegiate School, then at the University of Edinburgh. While at school he won many long-distance races. On qualifying, Douglas became resident house-physician to Joseph Bell at the Edinburgh Royal Infirmary, and worked for a short time there as surgical assistant to Joseph Lister. Thereafter he spent six months at Vienna in postgraduate study. He began general medical practice as an assistant at Richmond, settling down in 1880 in practice on his own account at Cupar, Fife, having acquired the practice of the late Dr. James Mackie, whose youngest daughter he afterwards married. Soldiering was one of his greatest interests: for 40 years he served in the Volunteer Force, afterwards transferring to the R.A.M.C.(T.) when the Territorial Army came into being. For many years Douglas served as battalion medical officer of the 6th (Fife) (The Black Watch) Royal Highlanders, spending his well-earned yearly holiday in training at camp. On the outbreak of the South African War he at once volunteered for service, being appointed M.O. of the 1st Bn. Worcestershire Regiment. During the war of 1914-18 Douglas served in France at H.Q., 51st (Highland) Division, afterwards commanding the casualty clearing station of the Division. Douglas was founder of the Fife Medical Society, being hon. secretary for the long period of 45 years; was a member of the Medico-Chirurgical Club, of the Harveian Society of Edinburgh, and of the E.R.I. Residents Club, being president of each of these at one time or other. At professional meetings he was often called upon to speak: addressing any meeting he was fluent yet concise and graceful, never diffuse, and always relevant; all his utterances were charged with common sense. He was an easy writer, contributing from time to time to the *B.M.J.* To the Harveian Society of Edinburgh he contributed "Two Medical Humourists"; to the Obstetrical Society there, "Observations on 70 Years of Country Midwifery Practice"; and he was an Alexander Black lecturer, choosing as his subject "The Family Doctor as Specialist."

To measure the good that Douglas did in his day is beyond doing—its extent is immeasurable. Each day of his working life was a full day, and his life a very full one. Practically the whole of his professional life was spent in Fife, which has cradled and given to medicine so many able men. Striving stoutly in his profession, he yet found energy and time for much else: he had an unusual power of work and of steady application. Belonging to a past generation, much of his work has faded from memory, but the good that he has done lives after him. What will live longest in the thoughts of his friends will be his amazing versatility and his high-souled character, for he had many lovable qualities. His wife died in 1939, after 57 years of married life; they were a most devoted couple, extremely happy in their home life. Of his two daughters one, Dr. Dorothy Douglas, is in medical practice in St. Andrews; the other is sub-prioress of the Convent at Bruges, so is for the time being completely cut off from home.

### Mr. H. S. SOUTTAR writes:

To live to a great age is a doubtful boon; to enjoy to the end of a long life all that life has to offer is a rare achievement. In spite of his years Douglas never grew old, and to the very end he

retained an ardour and alertness that we all envied. A voyage round the world in a large party is an experiment that few men of 80 would care to undertake, but when the B.M.A. met in Melbourne in 1935 Douglas was there. No one enjoyed the journey more than he, and there was no more popular member of the party. He was a fine chess player with a consummate knowledge of the game which was always at the disposal of us all. At the end of our tour he wished to return overland from Marseilles, and I persuaded him to come with me by air. He only consented on the condition that we should play chess! I shall never forget his boyish delight in every detail of our journey, and perhaps I owed to that that we agreed to draw our game as we came down at Croydon.

Douglas took a deep interest in the Association and in all the problems of our profession, and I have recent letters from him showing that his interest was unabated to the end. We have lost a wise counsellor and a good friend, but he has left behind memories of deep affection and of high regard.

#### ROBERT OWEN MORRIS, O.B.E., M.D., D.P.H.

By the death of Dr. Robert Owen Morris in his 84th year Wales has lost one of her most notable public men. A correspondent sends the following memoir to supplement the notice printed on Dec. 25:

Morris's career began as a shop assistant at Portmadoc, Caernarvonshire, but deciding to enter the ministry under the auspices of the Welsh Calvinistic Methodists, he returned to school, and then passed through Bala College to Edinburgh. After ordination he ministered in North Wales and was a welcome visitor to the pulpits of both Welsh and English Presbyterian Churches, including those in the Liverpool district. He was a powerful and popular preacher in great demand at special services. On the eve of accepting a call to one of the most prominent churches in North Wales, he decided to leave the ministry and return to Edinburgh as a medical student. He continued preaching in the churches of the Scottish Presbyterians, and was offered ministries in Scotland and America. These he did not accept, but went on with his medical studies and qualified M.B., C.M. in 1894 and took the M.D. in 1898.

He began medical practice at Birkenhead in 1895. A year later he was elected to the school board and was actively associated with education in the borough, first as a member of the board and later as a part-time school medical officer. Though not politically minded, he was prevailed upon to seek election to the borough council as a Liberal, and was successful. The Conservatives were in power during his membership, and Morris, always a powerful and tenacious fighter, was continually in opposition to the leading party. To his amazement, therefore, he was approached by members of the Conservative party in 1902 to accept nomination as mayor of the borough. This he accepted, and served in that capacity in the year 1902-3. At the time he was also serving the council as a part-time school medical officer. The passing of the Education Bill in 1902 debarred municipal employees from becoming members of councils by which they were employed. So that Morris might complete his year as mayor, a special clause was inserted in the Bill enabling officers to continue serving on their councils until October, 1903. Nine days before his term of office expired Morris resigned. After this he interested himself in public health, and when over the age of 50 took the D.P.H. of Liverpool University.

In 1911-12, with the passing of the National Health Insurance Act and the establishment of the Welsh National Memorial Association for the Treatment of the Tuberculous, he was persuaded by Mr. David Davies of Llandinam (now Lord Davies) to undertake the campaign in Wales against tuberculosis. For this purpose he toured the whole of Wales, lecturing in city, town, village, and hamlet. His early training as a minister served him in good stead. Wherever he went he drew crowds. He was able to talk to the public in simple but forceful manner, and his illustrations were always to the point. In Morris's later years the writer sometimes accompanied him to meetings on health matters, and was astonished at the hold he always had on his audience, especially an audience of school-children. The campaign ended, he became director of education for the Association and tuberculosis officer for Montgomeryshire, and in 1926 he took over Merionethshire as well. In these two counties he worked until 1931, when he retired as tuberculosis officer but retained his post as director of education. During his work as tuberculosis officer he travelled always by train, and it is said that no train would leave without him if it were known that he was due to catch it.

On his retirement he lived at Aberdovey, later moving to Fairbourne and then to Llwyngwril, where he died. He continued his lecturing and travelled throughout Wales as in his early days, taking part in health weeks, etc. He was the author of many pamphlets on tuberculosis and a part-author of the Red Cross textbook on tuberculosis. His work as a lecturer and writer gained him his election as Fellow of the Royal Society of Edinburgh. He was awarded the O.B.E. in 1935, and his public services were also recognized by his elevation to the magisterial bench in the borough of Birkenhead and the counties of Montgomery and Merioneth. He was also appointed High Sheriff for Merionethshire. He served as

a member of the Court of Governors of the University of Wales Aberystwyth. As a propagandist in health matters Morris was among those few medical men who could speak to the lay public in simple non-technical language. He was equally at home in English or Welsh.

He was a most lovable personality, jolly and entertaining company, kind and considerate, and a fearless and tenacious fighter when the cause was just. His passing is mourned by many throughout the breadth of Wales.

T. W. D.

## The Services

Temp. Surg. Lieut. J. Saint-Martin, R.C.N.V.R., has been mentioned in dispatches.

Surg. Lieut.-Cmdr. J. D. Lendrum, R.N.V.R., appears in a list of names published by the *London Gazette* as mentioned in dispatches for gallantry or good services in the last six months or more of war.

Wing Cmdr. J. P. Huins, O.B.E., A.A.F., and Acting Wing Cmdr. H. P. R. Smith, R.A.F.O., have been awarded the Air Force Cross.

Acting Wing Cmdr. C. C. Barker, R.A.F., has been commended for valuable services in the air.

The following appointments in recognition of gallant and distinguished services in the Middle East have been announced in the *London Gazette*:

*C.B.E. (Military Division).*—Col. J. R. Boyd, M.C., N.Z.M.F.; Brig. (local) G. W. B. James, M.C., Brig. (temp.) R. F. Walker, O.B.E., M.C., Cols. (temp.) R. H. Lucas, O.B.E., M.C., and D. C. Scott, O.B.E., R.A.M.C.

*O.B.E. (Military Division).*—Col. (temp.) R. McKinlay, Capt. (temp. Major) (acting Lieut.-Col.) R. J. V. Pulvertaft, R.A.M.C.

*M.B.E. (Military Division).*—Capt. (temp. Major) R. B. Robertson, R.A.M.C.

The *London Gazette* announces the appointment to O.B.E. (Military Division) of Major (temp. Lieut.-Col.) R. E. Tunbridge, R.A.M.C., and to M.B.E. (Military Division) of Capts. J. R. Bolton and J. J. Kempton, R.A.M.C., in recognition of gallant and distinguished services in Malta.

#### DEATHS IN THE SERVICES

By the death of Lieut.-Col. ALFRED ERNEST JOHN LISTER, I.M.S., on Dec. 21 at Stroud, Gloucestershire, the Service has lost a man of sterling worth. He studied medicine at St. Bartholomew's Hospital and in Vienna and passed both the London University M.B., B.S. and the conjoint examinations in 1900, held the Brackenbury Scholarship in Surgery and took the F.R.C.S.Eng. in 1902, and in the same year was placed first in the entrance examination for the Indian Medical Service. At the end of the Netley Army Medical School course he gained prizes in hygiene, surgery, and clinical medicine. Early in his career in India Lister saw active service in East Africa and Somaliland and gained a medal and clasp, and he was also on service during the war of 1914-18. He next entered the civil department of the I.M.S. and worked in various stations until he rose to be ophthalmic surgeon to the King George's Medical College at Lucknow when that school was opened. There by his sound professional knowledge and unassuming manner he gained the respect and affection of his colleagues, though he was handicapped by poor health, which led to his early retirement in March, 1920, before which he was appointed Hon. Surgeon to H.E. the Viceroy of India. For eight years he wrote the ophthalmic section for the *Medical Annual*. After his final return to England he settled in Bristol and was appointed honorary consulting surgeon to the Bristol Eye Dispensary and did some consulting practice, though still far from being robust in health; once more he gained the respect of his colleagues. He will be much missed by his many friends and admirers. Latterly he gave up his work in Bristol and went to live at Stroud. His wife and a daughter survive to mourn his loss.

## Universities and Colleges

#### UNIVERSITY OF OXFORD

In a Congregation held on Dec. 18 the following medical degrees were conferred:

D.M.—P. M. F. Bishop.  
B.M., B.Ch.—J. M. Hastings, A. I. M. Neill, W. B. Jack, R. H. M. Baines, J. V. Garrett, S. J. G. Spencer, R. W. Fynn, B. I. Johnson, J. Evans, D. W. K. Kay, F. I. Flint, W. L. B. Leese, G. I. M. Swyer, J. L. Insley, I. R. Silliman, Marcia I. P. Harvey.



No. 51

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Dec. 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) Ireland and Wales (London included); (b) London (administrative county); (c) Scotland; (d) Eire; (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths (second last line), for the week and those for the corresponding week last year, for: (a) The 126 great towns in England and Wales (including London); (b) London (administrative county); (c) The 16 principal towns in Scotland; (d) The 13 principal towns in Eire; (e) The 10 principal towns in Northern Ireland.

A dash—denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1943					1942 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	53	6	22	2	3	64	5	15	1	4
Deaths ..	—	3	—	—	—	—	—	—	—	—
Diphtheria ..	498	25	134	80	24	731	30	244	50	32
Deaths ..	9	—	4	2	—	14	1	5	1	—
Dysentery ..	96	20	69	1	—	103	15	43	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute ..	2	—	—	—	—	3	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Erysipelas ..	—	—	55	3	—	—	66	4	4	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years ..	43	2	4	9	1	23	3	10	25	2
Deaths ..	—	—	—	—	—	—	—	—	—	—
Measles ..	263	36	53	28	—	10,888	300	332	10	13
Deaths ..	1	—	—	1	—	16	—	3	—	—
Ophthalmia neonatorum ..	66	6	17	—	—	60	3	12	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever ..	1	—	—	—	—	3	2	2	—	1
Deaths ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* ..	2,079	119	83	16	8	671	48	7	7	3
Deaths (from influenza) ..	690	80	48	5	8	38	5	1	—	1
Pneumonia, primary ..	—	—	511	20	—	—	—	227	6	—
Deaths ..	—	124	9	17	—	—	33	9	10	—
Poliomyelitis, acute ..	3	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute ..	5	1	—	2	—	7	1	3	10	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever ..	—	1	10	—	—	—	—	12	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† ..	105	4	22	1	2	111	7	17	—	2
Deaths ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever ..	1,786	87	242	25	84	2,054	98	372	41	51
Deaths ..	1	—	—	—	—	4	1	—	—	—
Smallpox ..	—	—	—	—	—	—	—	1	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever ..	2	1	1	2	—	6	1	1	6	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Typhus fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough ..	1,244	99	130	21	16	837	51	29	47	7
Deaths ..	17	4	5	3	1	8	—	—	—	—
Deaths (0-1 year) ..	452	31	84	19	22	276	36	61	37	10
Infant mortality rate (per 1,000 live births) ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) ..	7,011	1,122	787	237	175	3,776	503	560	142	104
Annual death rate (per 1,000 persons living) ..	—	—	17.7	15.6	—	—	—	12.6	9.5	—
Live births ..	5,606	676	799	230	222	4,320	547	720	187	—
Annual rate per 1,000 persons living ..	—	—	16.3	15.1	—	—	—	14.9	12.5	—
Stillbirths ..	185	19	34	—	—	185	24	41	—	—
Rate per 1,000 total births (including stillborn) ..	—	—	41	—	—	—	—	54	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales infectious diseases continue to decline in incidence, notifications of acute pneumonia being down by 514, of whooping-cough by 156, of scarlet fever by 150, of diphtheria by 52, and of dysentery by 37.

Deaths from influenza in the great towns dropped to 690 (and in the week ending Jan. 1 to 464). There were 80 influenza deaths in London, 25 in Manchester, 25 in Sheffield, and 24 in Liverpool.

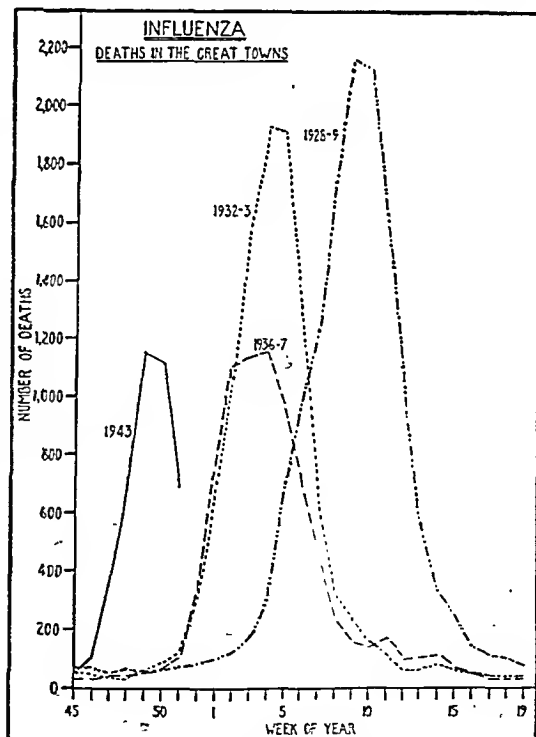
The lowered incidence of scarlet fever occurred mainly in the North, and also in London which recorded a drop of 58 cases. Notifications of pneumonia were down by 101 in London, and by 146 in Lancashire; in contrast to the general trend there was a rise in Yorks West Riding of 35 cases. Measles fell to a new low level, the largest returns being Lancashire 43, London 36, Durham 34.

The notifications of dysentery, though the lowest for over six months, were still relatively high. The chief centres were London 29, Lancashire 15, Kent 10, Essex 9.

In Scotland the only changes of note in the incidence of infectious diseases were rises in acute primary pneumonia 74, and dysentery 22. In Edinburgh notifications of dysentery rose from 20 to 54. The increase in pneumonia was in the western area.

## Influenza

The graph below shows a comparison of the deaths recorded in the large towns during the present outbreak with those in the three largest recent epidemics. The shapes of the curves of the completed epidemics are similar—a rapid rise to a maximum and an equally rapid fall; the four outbreaks have approximately the same rate of increase, although the heights of the maxima vary. The most notable feature so far of the present



outbreak is that the rise began some weeks earlier than in recent epidemics. It remains to be seen whether the present epidemic will follow the usual course and disappear during what normally would be the height of the influenza season, or whether the trend will display some secondary rise.

## Typhus in Naples

It has been reported that a rapid increase in the number of cases of typhus has occurred in Naples during the first week

of this year. The new cases have been estimated to be almost 100, and steps are being taken to prevent a major outbreak among the civil population. No case has occurred among Army personnel.

### The Week Ending January 1

The returns of the notifications of infectious diseases during the week in England and Wales included: scarlet fever 2,029, whooping-cough 1,509, diphtheria 578, measles 546, acute pneumonia 1,997, cerebrospinal fever 73, dysentery 89, paratyphoid 5, typhoid 7. In the great towns 464 deaths were attributed to influenza.

## Medical News

Dr. Geoffrey Marshall, O.B.E., F.R.C.P., physician to Guy's Hospital and Brompton Hospital, has accepted the invitation of Sir Walter Womersley to act as an honorary consulting physician to the Ministry of Pensions.

The Eugenics Society at its meeting on Tuesday, Jan. 18, in the rooms of the Royal Society, Burlington House, Piccadilly, W., will debate the proposition "That the programme of social security set out in the Beveridge-report should be supported on eugenic grounds." Lord Horder will take the chair at 5 o'clock.

The National Council for Mental Hygiene has arranged a course of twelve lectures on "The Psychology of Frustration and Fulfilment in Adolescence" to be given in Caxton Hall, Westminster, S.W., on Tuesdays at 5.15 p.m., beginning on Jan. 18. Tickets for the course (£1; single tickets 3s. 6d.) may be had from the Secretary of the Council, 39, Queen Anne Street, W.1. The lectures are specially addressed to those with social and educational interests, and four of the lecturers are headmasters or headmistresses. The first three lectures, by Dr. J. A. Hadfield, are on "The Psychology of Adolescence."

The following meetings of the British Institute of Radiology will take place in the Reid-Knox Hall, 32, Welbeck Street, W.1, at 2.30 p.m.: Friday, Jan. 21, meeting of medical members. Saturday, Jan. 22, ordinary meeting at which the following papers will be read: "Intra-cavitary Radium Techniques for the Treatment of Carcinoma of the Cervix Uteri," by G. J. Neary, Ph.D.; "The Combination of Gamma- and X-ray Therapy in Carcinoma of the Cervix Uteri," by B. Sandler, M.D. Gynaecologists interested in these subjects are cordially invited to attend.

The next meeting of the Biochemical Society will be held at the British Postgraduate Medical School, Ducane Road, Hammersmith, W.12, on Saturday, Jan. 22, beginning at 11.15 a.m. Luncheon (on notification) at 1 p.m.

At a sessional meeting of the Royal Sanitary Institute to be held on Wednesday, Feb. 9, at 2.30 p.m., at 90, Buckingham Palace Road, S.W.1, Mr. W. McAuley Gracie, director of infestation control, Ministry of Food, will open a discussion on rodent infestation. Members and others proposing to attend this meeting are asked to notify the Secretary of the Institute by Jan. 28.

The eighth annual medical conference of the Ex-Services Welfare Society will be held at the Waldorf Hotel, Aldwych, W.C., on Tuesday, Feb. 8, under the presidency of Lord Horder. The proceedings open at 10.30 a.m., and the medical aspect is likely to loom largely in the discussion. This conference will be followed on Feb. 11 by a meeting convened by prominent industrialists and trade union leaders.

The seventeenth annual meeting of the Association of Clinical Pathologists will be held in London at Guy's Hospital on Friday and Saturday, Jan. 28 and 29, beginning each day at 9.15 a.m. A full programme of short papers has been drawn up for the morning sessions. On Friday afternoon there will be demonstrations followed at 4.30 p.m. by the presidential address by Dr. A. F. Sladden on "The Significance of the Laboratory." The honorary secretary is Dr. W. H. McMenemey, Royal Infirmary, Worcester.

Dr. A. B. Lindsay, medical officer, Indian Tea Association, has been appointed O.B.E. (Civil Division) for services in connexion with the Burma Campaign, May 21, 1942, to June 20, 1943.

The new address of the Central Council for District Nursing in London is 25, Cockspur Street, S.W.1.

Coloured labels will in future denote the various strengths and kinds of insulin: 20 units per c.cm. will have a buff label; 40 units a blue, and 80 units a green. The same colours will be used in combination with pink for protamine-zinc-insulin, and in combination with orange for globin insulin.

After an interval of four years the annual meeting of French gynaecologists was held on Oct. 16 in Paris, where the French Society of Gynaecology met on Oct. 10.

In September there was an epidemic of poliomyelitis in Amsterdam, 66 cases of which had originated abroad.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Clinical Estimation of B.M.R.

Q.—Is there any method of estimating the basal metabolic rate clinically? I seem to remember hearing of a formula which depended on the estimation of the pulse rate and systolic and diastolic blood pressure. Can you tell me what the formula is, how it is carried out, and whether it is of value in estimating the progress of a case of hyper- or hypo-thyroidism?

A.—There are several ways of estimating the B.M.R. without actually measuring it. The best-known is that of Read and Barnett. Where P.R. = pulse rate and P.P. = pulse pressure, the Read and Barnett formulae are: for men, calories per sq. metre per hour 
$$= \frac{P.R. \times P.P.}{200} + 27$$
; for women, 
$$= \frac{3 \times P.R. \times P.P.}{700} + 24$$
. In order to convert these figures into B.M.R., they must be divided by the normal calorie production per sq. metre per hour, as given in Du Bois's chart:

Age	Males	Females
14-16 .. .. .	46 .. .. .	45 .. .. .
16-18 .. .. .	43 .. .. .	40 .. .. .
18-20 .. .. .	41 .. .. .	38 .. .. .
20-30 .. .. .	39.5 .. .. .	37 .. .. .
30-40 .. .. .	39.5 .. .. .	36.6 .. .. .
40-50 .. .. .	38.5 .. .. .	36 .. .. .
50-60 .. .. .	37.5 .. .. .	35 .. .. .
60-70 .. .. .	36.5 .. .. .	34 .. .. .
70-80 .. .. .	35.5 .. .. .	33 .. .. .

This method has some use in checking the progress of an individual patient. It is extremely unreliable for comparison between one patient and another.

Bartlett's method depends upon the breath-holding ability or duration of voluntary apnoea (D.V.A.). A person of normal B.M.R. is said to be able to hold his breath 1.8 to 2 times as long after inspiration as after expiration. In thyrotoxic patients the D.V.A. in both circumstances is reduced, but especially after inspiration.

D.V.A. In. This method  
There is therefore a reduction in the ratio  $\frac{D.V.A. In.}{D.V.A. Ex.}$

is so inaccurate that it is of no value except as a slight indication of an abnormal trend. Almost as unreliable is the "pulse-pressure pulse-rate index." The P.P.×P.R. of a normal person is said to lie between 2,880 and 3,000. It is probably true that the greater the deviation from these figures the greater is the probability of the B.M.R. being found to be abnormally high or low, but this is all that can be said for the method.

#### Neuritis with Osteo-arthritis

Q.—A woman aged about 60, nullipara, for years has had osteo-arthritis in neck and back. Massage has recently improved this and movements are comparatively free and painless. Lately a form of neuritis (?) has developed, chiefly in the left arm and especially the hand and fingers, more particularly affecting distribution of ulna nerve. Salicylates improve matters to a certain extent only. Lini-ments are unsuccessful. After pain subsides numbness is felt followed by pain when sensation returns to normal. No swelling or inflammation. No cramp. Pulse and pressure normal. The condition is intermittent. Would further local massage improve matters.

A.—The symptoms in this case appear to be due to intermittent pressure on the cervical nerve roots as they pass through the foramina, and are not infrequently met with in slight degree in osteo-arthritis of the cervical spine. The pressure may be due to osteophytes in the vicinity of the foramen, or to narrowing of the foramina from thinning of the intervertebral disks due to the degenerative processes of advancing years, or to mild trauma. The thinning may be uneven, greater on one side than the other, or may

be associated with prolapse of the nucleus pulposus of the disk. The degree of compression is affected by posture. The absence of any mention of muscle-wasting in this case indicates that the pressure is not of a serious degree. It may be due to prolapse of a disk rather than to bony pressure. X-ray examination is desirable and should include profile and oblique views; the latter will often be found to give the clearest picture of the foramina. From the ulnar distribution of the sensory disturbances it is evident that the lesion affects the eight cervical and first dorsal roots. Sometimes the pressure is greater than the degree of bony obstruction will account for as seen in the radiograph, and it may then be due to soft-tissue changes or perivertebral inflammation, which will later go on to calcification. As the movement of the spine becomes more limited by the bony outgrowths the pain may diminish. Treatment is not very satisfactory. Massage alone is not likely to be of much service, but associated with infra-red rays or short-wave diathermy may exercise a palliative effect. A supporting collar of leather or celluloid to carry the weight of the head and limit the movements of the spine would probably give a good deal of relief, but the remedy might be regarded as a more serious inconvenience than the pain. Surgical measures have been carried out with success in severe cases. A review of the subject under the title "Nervous Manifestations in Vertebral Rheumatism" appeared in the *Reports on Chronic Rheumatic Diseases*, 1935, 1, 128.

#### Swollen Leg after Parametritis

**Q.**—In March, 1942, a married woman aged 25 had her first baby—by Caesarean section owing to obstructed labour. Severe parametritis ensued; treated with sulphonamides by mouth and intramuscularly. These were given into the left buttock and caused a good deal of pain. Convalescence was very prolonged, with white-leg on left side. This has gradually improved with massage, viscopaste bandages, etc., but the leg is still enlarged, heavy, and painful, especially thigh and buttock. There is no oedema, the swelling does not pit on pressure, and is soft and of fatty consistency. She has always had rather big, fat legs. Can anything be done for the relief of this condition?

**A.**—These cases are difficult and often disappointing to treat. The thickening of the limb will certainly be permanent. Considerable relief of pain and aching would be given by expert massage. If the circulation in the limb is seriously impaired, then an improvement could be expected by a sympathectomy. The possible response to such treatment could be tested therapeutically beforehand by injecting the lumbar sympathetic on the left side. Segments 2, 3, and 4 are the ones concerned. It should be noted that encouraging results are now being obtained by this method of treatment in the acute phase of thrombosis. The prognosis in this particular case after such a long interval is not very good.

#### Intrameatal Angioma

**Q.**—A boy aged 16 months has a small reddened area just inside the urethra. This bleeds and causes a good deal of pain on micturition. It is very resistant to treatment. Could you advise me as to treatment? The child was circumcised as a baby.

**A.**—The description suggests that the condition is a small intrameatal angioma. As it is causing trouble it would probably be unsatisfactory to see what change time would bring about. If it is small it could be "diathermized" carefully without much fear of stricture. If so extensive that contracture would be a definite hazard of destructive treatment, irradiation must be used. There are obvious technical difficulties about the use of radium here in a small child, but with some ingenuity they could be overcome.

#### Angioneurotic Oedema

**Q.**—I have a man in the middle fifties who gets the unsightly swellings of angioneurotic oedema on his lip, and I have given him a course of calcium. In severe cases an injection of adrenaline might remove the swelling, but obviously it should be used only where the swelling might cause danger to life. Is there any other treatment with any prospect of success?

**A.**—An attack of angioneurotic oedema depends upon two groups of factors: (1) an allergic sensitivity, and (2) some incident which temporarily depletes or lessens the body's supply of adrenaline. The allergic sensitivities fall into three groups: first, drugs—commonly aspirin (usually taken for colds or headaches) and phenolphthalein (in aperients); secondly, feather, down, or horsehair bedding or pillows if the swellings begin at night or in the early morning, or dust if during the day; and, thirdly, certain foods. The adrenaline-depleting factors include worries, upsets, and sudden emotions, following acute or chronic illnesses, colds, and headaches. Hence swellings usually occur when a sensitive person gets a cold or a headache and takes an aspirin; when he develops a cold or an illness and is put to bed on feathers or down, or returns to some dusty job too soon after an illness; or following a gastro-intestinal upset and large quantities of certain gruels or cocoa-egg-milk beverages are given. In the treatment of the acute attack, 5 minims

of adrenaline chloride (1 in 1,000 solution) should be given at once hypodermically, and 3 minims repeated each 1/4, 1/2, 1, or 2 hours until the swelling has gone down. Ephedrine hydrochloride, 1/2 gr., should be given every four hours at the same time. Calcium is of no value. A careful history to classify the case into drug, inhalant, or food group is essential; the use of skin tests, avoidance of indicated causes, or desensitization offer very good chances of success.

#### Hereditary Cold Fingers

**Q.**—What is the treatment of arterial spasm in hands and feet of a married woman of 29? The condition, which has been present since childhood, appears as a reaction to cold, even to mild degrees of cold in the summer. The fingers, and sometimes the whole hands, become white and numb and painful, and the only way to restore the circulation easily is by immersion in very hot water. This is complicated in very cold weather by chilblains, which usually ulcerate and take weeks to heal.

**A.**—In view of the early onset and the type of colour change the trouble should be regarded as "hereditary cold fingers" rather than Raynaud's disease. It is therefore unlikely to get more serious or to merit operative treatment, though it may well have been aggravated by wartime conditions. Cold and cold water should be avoided so far as possible. A warm room is desirable during the day, and a hot bottle or bed-socks at night. Warm clothing is essential, and the hands should be kept warm with gloves, muff, or a winter-warmer such as the "platinum pocket warmer." The skin of the fingers should be kept soft with a suitable grease, and cracks dressed with collodion or elastoplast. Drug treatment is unlikely to be effective as the disorder is basically a morbid constitutional response to cold. Calcium salts and thyroid still have their advocates, though at present nicotinic acid is in favour. It is given in a dosage of 50 mg. t.d.s., which may be increased if necessary up to 500 mg. a day.

#### U.V.L. from M.V.L.

**Q.**—What is the present opinion of the value of ultra-violet light from a mercury vapour lamp as a therapeutic agent for maintaining health at this time of year, particularly in young growing children? How often should exposures be given, and what area of the body should be exposed on each occasion? Is blondness a contra-indication?

**A.**—The value of general irradiation with U.V.R. can be ascribed to three factors: (a) vitamin D production; (b) esophylactic reaction; (c) psychological effects.

(a) To promote the first of these, which is of importance in the maintenance of health, particularly in children, the largest possible area of skin should be irradiated by exposing all aspects of the body. Suberythral treatments should be given two to four times a week. As tolerance is not rapidly established with such doses, there is need for small increments only.

(b) The lethal action of U.V.R. can be made use of to provoke inflammatory reactions in the skin which, in the presence of antigens, appear to produce the elaboration of appropriate antibodies. A first-degree reaction over approximately one-sixth of the total body skin area should be aimed at and be repeated three times a week.

(c) The psychological effect can be enhanced by using a powerful source of luminous rays in conjunction with the M.V.L. and by encouraging relaxation during the treatment.

The so-called "tonic" effect attributed to "artificial sunlight" is probably due to a combination of the above effects. Blondness in itself is not a contraindication, but the thinness of the corneal layer of the skin, coupled with the inability to produce pigments so often encountered in these subjects, often makes them more sensitive to this form of treatment.

\* Esophylactic is defined in Dorland's *Medical Dictionary* thus: "Exerting a phylactic or protective influence from within, such as that of the fluids and cells of the body."

#### Plums and Apples

**Q.**—What food value is there in plums? I believe the plum has a low vitamin C content, and it is popularly described as an acid fruit tending to irritate the gastro-intestinal tract. What are these acids? Are they harmful in any way, and what nutritional virtue is there in this widely distributed fruit? Incidentally apples are also lacking in vitamin C—with the exception of Bramley seedlings—and this raises the question of the nutritional value of the familiar mixture of plum and apple in pies and in jam.

**A.**—Fortunately we still live on food, and not on vitamins. Most of us eat plums and apples because they have a pleasant and refreshing taste—in other words, because we like them. It is true that they contain very much less vitamin C than some other fruits, but this is no reason why we should scorn them. At the present time all foods which give flavour and variety to meals are of tremendous importance. Every housewife knows this and she rightly prizes such foods.

There is no evidence that plums, eaten in moderation, do the slightest harm to the majority of people. They may cause gastro-

intestinal irritation in a small number of persons; but what food is free from this objection? Experiments on healthy people showed that the amount of faeces passed when a large quantity of plums was eaten was no greater than when the diet contained no fresh fruit at all.

## INCOME TAX

### War Damage Claim—Assessor's Fee

A. F. lost some professional books, domestic furniture, and clothing by enemy action. The claim made has been accepted by the Board of Trade. A fee of 5% of the amount has been paid to the assessor. Can this be treated as an allowable deduction for income-tax purposes? He is assessed under Schedules A and E.

\* If A. F. is required to replace and use the professional books for the purposes of his employment—which, however, is apparently not the case—he can claim to deduct a proportion of the assessor's fee. Otherwise no claim can be made—he is in the position of a private citizen who has had to incur a personal expense.

### Cost of Cars

"RURAL'S" husband is in the R.A.F. and she is running the practice, using two old cars owing to the impossibility of buying a new one. Is she entitled to the 20% allowance for depreciation on both cars?

\* The question is governed by Rule 6 applicable to Cases I and II, Schedule D, which provides for a "deduction . . . representing the diminished value by reason of wear and tear during the year of any machinery or plant used for the purpose of the trade . . ." (This provision was later extended to professions.) If both cars are in fact used the allowance applies to both, and presumably will be based on the standard 20% of the written-down value.

### Military Service Expenses

J. M. H. incurs certain expenses by way of subscriptions to associations and for professional literature. He has claimed to deduct the amount from his R.A.M.C. pay and has been refused.

\* Official pay is chargeable to income tax under Schedule E, and expenses to be allowable must be wholly, exclusively, and necessarily incurred in the performance of the official duties. Such expenses as those indicated are not regarded as necessary in the performance, etc. (however desirable as a means of preparation therefor), unless the subscriptions, etc., have to be paid to comply with a condition of the employment. We fear that J. M. H. has no alternative but to accept the position.

### Assistant—Car Expenses

W. G. is an assistant receiving an allowance for the use of his own car. This brings his gross receipts over £600. Will that exclude him from the new system of tax deduction which comes into operation next April?

\* The £600 limit in the Income Tax (Employments) Act, 1943, applies to "emoluments." The amount allowed to an assistant because he uses his own car is not an "emolument" but merely the refunding of expenses incurred or accruing, and would not therefore be taken into account in dealing with the £600 limit. The way in which the limit works is that individuals whose emoluments exceed £600 are excluded, but it is to be inferred from statements in the House of Commons that in fact the limit will be abolished and will not operate in April next.

## LETTERS, NOTES, ETC.

### What is a Yawn?

Dr. B. H. KIRKMAN (St. Mary Cray, Kent) writes: The answer to this question (Nov. 20, p. 664) is in my opinion not altogether satisfying. Your correspondent considers that oxygen lack is the causal factor, but there is very little evidence that cerebral anoxia is operative in conditions under which physiological yawning occurs. It is much easier to alter the carbon dioxide content of the circulating blood under such conditions than the oxygen content. Further, yawning usually takes place under conditions favouring the accumulation of CO<sub>2</sub>—e.g., after sleeping or in stuffy lecture halls. The accumulation of CO<sub>2</sub> in such conditions provides the necessary pre-disposition to yawning, while the example of others constitutes a precipitating factor. If CO<sub>2</sub> accumulation is the cause of yawning there is no need to postulate a depressant action on the upper levels of the respiratory centre. The direct stimulant action of CO<sub>2</sub> on the basal centres (respiratory, vomiting, vasomotor) is well known, through the work of Dale and Evans and others. It is well established, as your correspondent points out, that anoxia produces depression of cerebral activity, and it is equally true that oxygen intoxication produces epileptiform convulsions (Paul Bert and

J. B. S. Haldane); but both of these phenomena occur well outside the physiological range of oxygen tensions. There is, so far as I am aware, no evidence to suggest that under normal conditions cerebral anoxia sufficient to cause definite depressive or release phenomena can occur. Your correspondent states that it is difficult to see any connexion between yawning in animals as part of an emotional reaction and yawning occurring in man and dogs under conditions of boredom. It is well known that a part of the emotional response in animals is an alteration in the rate and depth of breathing. Is it not possible that yawning in the "dilemma" situation in dogs is due to reduction of the respiratory output of carbon dioxide?

The importance of yawning in practical medicine is slight, but the discussion of its mechanism and genesis brings up the very important question of the excitability of the central nervous system in relation to gaseous tension and its bearing on the phenomena of epilepsy, tetany, ether clonus, post-encephalitic Parkinsonism, and catatonic schizophrenia. In epilepsy it has been shown that carbon dioxide exerts a depressant action on the cerebral cortex (Hill), and that its removal by overbreathing facilitates the onset of an epileptic fit. There is, so far as I am aware, no more experimental evidence to suggest that variations in the supply of oxygen to the brain are a causal factor in yawning than in epilepsy.

In conclusion I would point out that your correspondent does not mention one of the most consistent examples of yawning—namely, that which occurs immediately after the intravenous injection of pentothal and amytal. This response is so rapid that it cannot be attributed to any alteration in the gaseous balance and must be considered to be an example of a release phenomenon such as your correspondent envisages.

### Relief of Thirst

Col. E. C. HODGSON, I.M.S. (ret.) writes: Having read your review of Dr. Macdonald Critchley's book *Shipwreck Survivors* (June 12, p. 726) and realizing, in part at least, the terrible torture of thirst in the Tropics, after 35 years in various parts of the Tropics—India, the Sinai Desert, and above all a summer in the Jordan valley with no protection, even of a tent, from the sun in 1918—may I mention the greatest immediate relief that can be obtained from inordinate thirst? The body should be soaked in a bath or the sea, and within 5 minutes the inordinate thirst vanishes to a mere desire for a small glass of fluid, and the lips and tongue become moist again, instead of sticking to the teeth and roof of one's mouth. I see in your review that Dr. Critchley mentions a 50% survival rate after 32 days' almost entire submersion; I suggest *because* of almost entire submersion. Medical field research work in the open on malaria, plague, and cholera during the hot weather in India, etc., where to drink the local water supplies would soon make one a casualty, has at least shown what thirst can mean; and the amazing sensation of relief that quickly follows immersion of the skin in water shows where the cry for fluid comes from in the body.

### Treatment of Paronychia and Subungual Sepsis

Dr. W. H. PALMER (Hayle, Cornwall) writes: Until now, among the most discouraging of minor septic ailments have been cases of paronychia with commencing subungual sepsis. No matter what was done the condition almost always spread further and further under the nail, and it was lucky if one had to do no more than remove the nail to prevent or cure even deeper or wider mischief. It meant also to the manual worker a period of disability generally adding up to weeks. The trouble usually starts with a crack or tear in the cuticle, and generally in the corner, which gets red and inflamed, and then a bead of pus can often be expressed by gentle pressure from under its edge. For the last year I have been treating these cases by the following method, and have not had to remove a nail, and only rarely incise anywhere. The condition has been cured rapidly, sometimes in only a few days. The fact that pus had really been under the nail is proved by the destroyed area of nail showing as it grows up to view.

Attention to the following details is important, but the whole process takes only a few minutes. (1) The cuticle is gently raised off the nail by a blunt, flat-pointed instrument, or back edge of a scalpel near its point. (2) Gentle pressure is tried to see if pus comes, which is then wiped away with cotton-wool. (3) Pulv. sulphanilamide-P is gently pressed under the raised cuticle edge as deep as it will go in without causing real pain, and a little heap left all round the cuticle edge. This takes less than half a tablet. (4) A narrow piece of elastoplast gauze is then put over that heap of powder and round the digit, leaving top and bottom edges free. (5) The whole must be kept quite dry. (6) The above process is repeated daily at first, and later at intervals of two or three days, until no inflammation is visible. (7) If obvious pus is there which doesn't come out from under the cuticle a small incision may be necessary. The comfort and speedy cessation of pain or throbbing are remarked on by the patient, generally within 24 hours. Possibly sulphanilazole would do as well, or even better, but the results with sulphanilamide-P have been so good that I have not tried anything else.

LONDON SATURDAY JANUARY 22 1944

## EMPHYSEMA OF THE LUNGS\*

BY

RONALD V. CHRISTIE, M.D., D.Sc., F.R.C.P.

*Professor of Medicine in the University of London: Physician to St. Bartholomew's Hospital*

### PART I

Emphysema is a progressive and incapacitating disease, and, although its description is precise and dogmatic in most textbooks, the majority of cases diagnosed on the post-mortem table are not recognized during life, many experienced physicians admitting that they do not understand the diagnosis of emphysema, except in its later stages. Even the term "emphysema" is ambiguous: in these lectures it is used to mean chronic vesicular or hypertrophic emphysema of the lungs, it being understood that acute emphysema, senile emphysema, and localized emphysema are probably separate and distinct entities. I will discuss first the nature of the lesion as shown by observation of the living subject as well as by necropsy.

#### Nature and Extent of the Enlargement of the Lung

The most obvious changes are in the alveoli, the walls of which appear stretched, thin, and in many places ruptured, so that the septa between adjacent alveoli may be reduced to small projections. It has been claimed that the rupture of the alveolar wall begins at the so-called alveolar pores, but whether or not this is true seems to be of little significance. Of much greater importance is the effect of this destructive process on the air sacs of the lung and on the volume of the lung as a whole, and several changes have been described:

- (a) The normal lung lobule or air sac consists of an alveolar duct opening into the atrium, around which are placed the alveoli, and in health there is a sudden transition from narrow alveolar duct to wide atrium, so that the inspired air may be thrown as a jet into the more remote parts of this terminal segment. These lobules have been studied in detail by means of serial sections and of specimens injected with celloidin, and in emphysema it has been shown that the lobule is distorted and sometimes distended (Beitzke, 1925; Countz and Alexander, 1934). The alveolar duct is dilated and funnel-shaped, so that air is no longer thrown into the atrium as a jet. If it could be shown that this jet of air does in fact serve a useful purpose in ventilating the lobule, it would be reasonable to suppose that this function would be impaired in emphysema.
- (b) As the alveolar walls become thin and disappear the air sacs may lose their honeycomb structure and so be deprived of their supporting framework; this is especially true on the surface of the lung, where large bullae may be formed. Provided that the airways on these lobules and bullae remain patent, one would expect that very little pressure would be required to deflate them, and once deflated very little traction would be required to distend them. In other words, it might reasonably be supposed that these flimsy lobules could be more distensible than those lobules which had not lost their supporting framework of alveolar septa.

- (c) Another important sequel to this dilatation of the air sacs is the increase of the volume of the lungs as a whole, which is usually

obvious on the post-mortem table: the large fluffy lungs strongly suggest that during life there is an increase in the amount of air they contain. This amount can be measured, and early in the present century several investigators showed that there is usually an increase in the residual air in emphysema. But the residual air is the amount of air left after a forced expiration, and it is well known that patients with emphysema may have great difficulty in forcibly emptying their lungs. A more significant measurement is the amount of air in the lungs at the end of an ordinary quiet expiration; for this is their true air content during life, while the residual air is the result of respiratory gymnastics and may have no relation to the normal size of the lungs. In the accompanying Chart are shown the results of measurements of the lung volume and

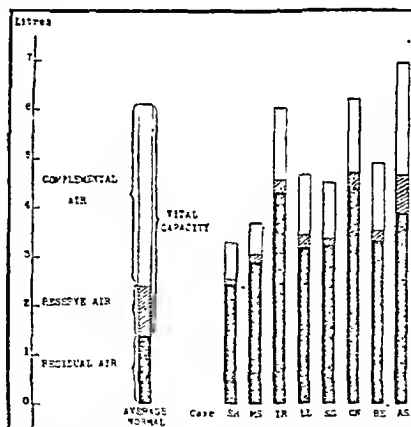


Chart showing the lung volume and its subdivisions in emphysema. Cases are arranged from left to right in order of severity of dyspnoea.

its subdivisions in 8 patients suffering from emphysema; it is clear that the amount of air in the lungs was increased in all of them, although only very slightly in several. For instance, the increase was slight in the case of S. H., and yet he was an evident case of emphysema, with dyspnoea on the slightest exertion; while in C. N., a less severe case of emphysema, the volume of the lungs was greatly increased. In none of these cases was the increase ever as great as the volume of a normal lung in full inspiration. These findings have been confirmed by several investigators, and it is clear that in emphysema the lungs as a whole usually contain more air than they should, but this never amounts to more than the increase which occurs in the size of the lungs of a normal individual when he takes a breath of moderate depth. (Hurtado, Fray, and McCann, 1933; Christie, 1934; Anthony, 1936; Courmand, Lassen, and Richards, 1937.) There is certainly never evidence of true overdistension or overstretching of the lungs as a whole, and sometimes

\* An abridged version of the Goulstonian Lectures delivered before the Royal College of Physicians on March 4, 9, and 11, 1943.



in even severe emphysema there is no enlargement, but this is uncommon. On the post-mortem table the lungs seem to be greatly enlarged mainly because they do not collapse, and the microscopical appearance of gross over-distension of the alveoli must be due chiefly to destruction of the alveolar walls and the fusion of air spaces.

We can conclude from these various observations that the emphysematous lung is deformed in at least three ways. First, many lobules or air sacs are misshapen and the alveolar ducts are dilated, so that air is no longer thrown into the atrium as a jet. Secondly, the septa between alveoli may disappear, so that the supporting framework of the air sac may be lost. These air sacs or bullae then become comparable to bags of tissue paper, which are easily compressed and easily dilated. Thirdly, the amount of air in the lungs is usually increased, but this increase is not proportionate to the severity of the disease, nor is the volume of the emphysematous lung at rest ever as great as the volume of a normal lung in full inspiration. Thus, whatever may be its microscopical appearance, the lung as a whole in emphysema is not overstretched or over-distended any more than a normal lung is over-distended or overstretched when a breath of moderate depth is taken.

Changes in the lumen of the bronchi and bronchioles also occur, but these are not constant. The terminal bronchioles as well as the alveolar ducts are usually dilated, and this may extend up to the smaller bronchi, producing a picture resembling cylindrical bronchiectasis. The state of the medium and larger bronchi is, however, very variable, and depends more on the degree of bronchitis than on the degree of emphysema, although some atrophy and dilatation are usual in severe cases.

#### Elasticity of the Lung

Changes in the elasticity of the emphysematous lung were first suggested by a Fellow of our College, William Watson, in 1795. When the thoracic cage is opened on the post-mortem table the lungs do not collapse, and this alone would appear to be proof that the normal elastic recoil of the lung had been lost. However, more detailed observations on the pulmonary elasticity made by measuring the force required to inflate and deflate the lung, have given conflicting results in emphysema (Tendeloo, 1925; Loeschke, 1928; Thies, 1932). Considerable changes in the elastic properties of the lung occur after death, and the significance of post-mortem measurements of elasticity has been seriously questioned. The fact that the lungs do not collapse when the thorax is opened has been said to mean only that they are overstretched in the same way as a spring may be overstretched and yet maintain much of its elasticity. Histological study of the lungs gets us no further, as there is the same disagreement among morbid anatomists as to whether the elastic fibres are destroyed or merely overstretched; nor do the morbid appearances indicate whether loss of elasticity is an early or a late manifestation of the disease. These points are not merely of academic interest, as, if it can be shown that loss of elasticity is early and complete, many of the changes in emphysema can be explained, and for this reason I have measured the elasticity of the lung during life in three cases of pulmonary emphysema. The method used has been described elsewhere and its accuracy has been confirmed (Christie and McIntosh, 1934; Paine, 1940a, 1940b). It is based on the simple observation that the intrapleural pressure is a direct measure of the tension or elastic recoil of the lung. In emphysema the intrapleural pressure is not always negative as it is in health; even at the end of a full inspiration the intrapleural pressure may be the same as that of the atmosphere, and it is not altered when the lung is collapsed by a pneumothorax. These phenomena can only mean that the elasticity of the lung in emphysema may be entirely lost at a comparatively early stage of the disease (Christie, 1934).

It is usually assumed that any loss of elasticity is secondary to over-distension—an assumption which is unsound, as the lungs as a whole are neither overstretched nor truly over-distended. It is not generally realized that the converse is more likely to be true: the enlargement of the air sacs and the fact that this enlargement is most conspicuous at the periphery of the lung can be fully explained as being the direct result of loss of elasticity. That this is so is apparent if it is remembered that, in health, distension of the lung is maintained by traction of the chest wall and diaphragm, and this traction is counterbalanced by the elastic pull of the lungs. It follows that if

these forces are abolished, as occurs when an artificial pneumo thorax is given, expansion of the thoracic cage is to be expected as well as collapse of the lung. That considerable expansion of the thoracic cage does in fact occur while an artificial pneumo thorax is being given can be shown if the patient breathes from a recording spirometer; the air displaced into the spirometer is only about half of what is injected into the pleura, and the rest must have been utilized in expanding the thoracic cage (Christie and McIntosh, 1936). It is clear, therefore, both from first principles and from experiment, that loss of pulmonary elasticity in emphysema could be the direct cause of expansion of the thoracic cage.

Loss of elasticity could also explain the real over-distension of air sacs, with bulla formation which occurs on the surface of the lung. With loss of elasticity the expanding force is no longer equally distributed, and equal expansion in different parts of the lung should not be expected. In fact, the greatest expansion should occur where the force is applied, and this is at the surface of the lung. With each inspiration one would expect the superficial air sacs to be strained and stretched to a greater extent than the air sacs deep in the lung, and with this process going on for months and years, it is easy to understand the formation of bullae on the surface of the organ.

#### Pulmonary Circulation

Extensive changes are described in the pulmonary circulation. Many of the capillaries are torn and obliterated, and there is usually widespread atherosclerosis of the pulmonary vessels. A great deal has been said and written on the relationship of the vascular destruction to hypertrophy of the right ventricle, and although this controversy may be of importance with regard to the aetiology of cor pulmonale, it seems to be of little significance in emphysema. All are agreed that the pulmonary vascular bed is diminished in emphysema and that the work of the right ventricle may be increased, but this does not mean that the total blood flow through the lung is diminished. If it were reduced the output of the left ventricle would also be reduced, and there is evidence, which I need not describe, that this does not occur until heart failure supervenes.

The lymphatic circulation in emphysema has received but scant attention. The peripheral lymphatics may show cellular infiltration, and the characteristic pigmentation of the lung probably reflects deficient lymphatic drainage.

#### Distribution of the Lesion

To the naked eye the lesion appears to be most pronounced on the surface of the lungs, especially along the margins, where large bullae may be apparent. Under the microscope, however, it is clear that the changes we have been discussing extend throughout the lung, although the dilatation of air sacs is most conspicuous at the periphery. Characteristic changes outside the lungs have been described. The visceral pleura is thin, flimsy, and atrophic. There is usually a moderate degree of kyphosis, involving all the thoracic vertebrae, which is in contrast to senile emphysema, in which the curvature is as a rule upper dorsal. The vertebral cartilage may be thin and compressed anteriorly, where there may be tipping of the vertebrae. Perhaps partly owing to this curvature, the ribs are widely spaced and run horizontally, and their cartilages frequently show ossification or become elongated and less elastic (Kount and Alexander, 1934).

#### Haemo-respiratory Exchange

By far the most important disturbance of function in emphysema is an inability to ventilate the blood, and this is usually apparent many years before the patient reaches the pathologist. The simplest way to measure deficient ventilation in the lungs is to analyse the arterial blood, for this is what the lungs have ventilated. This has been done on many cases with emphysema (Meakins and Davies, 1925; Peters and van Slyke, 1931; Hurtado, Kaltreider, and McCann, 1935); the accompanying Table describes the results of such an analysis in two of the patients whose pleural pressure had been measured and the elasticity of whose lungs was found to be destroyed, and in another even more severe case. These

cases have been chosen as they represent moderate emphysema, severe emphysema, and emphysema in its terminal stages. The first (I. H.) had the obvious symptoms and signs of emphysema, but under conditions of rest there was no dyspnoea and no cyanosis. He could walk around the ward, but if hurried became dyspnoeic. His haemoglobin was normal in amount

*The Arterial Blood in Emphysema. (For Methods used see Christie, 1934)*

Case	Oxygen			Carbon Dioxide				Remarks
	Capacity	Content	Saturation	Content (Whole Blood)	Content (Plasma)	p. CO <sub>2</sub> (calculated)	Alveolar p. CO <sub>2</sub>	
	Vols. %	Vols. %	%	Vols. %	Vols. %	mm. Hg	mm. Hg	
I. H.	19.4	17.5	90	51.4	62.6	47	39.3	
	21.0	19.4	92	47.2		43	38.5	
S. H.	26.4	21.6	82	53.1		83	71	Saturation 102% when breathing 100% oxygen
	28.6	22.4	78	51.1		73	68	
H. R.	20.9	15.1	72	74.5	101.7	93		{ Venous blood without stasis After venesection of 900 c.cm.
				74.1	88	90		
						84		

but only 90% saturated with oxygen, which suggests a slight impairment of oxygenation.

The second (S. H.) was a much more severe case of emphysema; he was short of breath on the slightest exertion, there was considerable cyanosis, and the changes in the arterial blood were more striking. The saturation of the blood with O<sub>2</sub> was only 80%, but this anoxaemia could be relieved by oxygen, which is characteristic of emphysema and is, of course, proof that the cause is some impairment of ventilation of the blood in the lungs. In an attempt to compensate for oxygen lack the amount of haemoglobin was increased; the oxygen-carrying power of the blood was 27 vols.%, which is equivalent to a Hb value of over 130% according to any of the ordinary standards. There was also a spectacular increase in the pressure of CO<sub>2</sub>, both in the blood and in the alveolar air. This increase in CO<sub>2</sub> in the alveoli is, as I will stress later, characteristic of severe emphysema, and is proof that the cause of the accumulation of CO<sub>2</sub> in the blood is deficient ventilation, and not any barrier between the blood and the alveolar air.

The third case has been included because it represents the most marked disturbance of haemo-respiratory exchange in emphysema which, to the best of my knowledge, has ever been described. He was a typical case of advanced emphysema, and was critically ill, with severe heart failure. The oxygen saturation of his arterial blood was 72% and the pressure of CO<sub>2</sub> lay between 84 and 93 mm. Hg. Not only did he show a compensatory polycythaemia but also a compensatory increase in the bicarbonate reserve, without which he would have suffered a fatal acidosis. This combination is often found in severe cases of emphysema, and in my opinion is another illustration of how confusing is the practice of defining acidosis or acidemia as a decrease in the alkali reserve or CO<sub>2</sub>-combining power, and defining alkalosis or alkalemia as an increase in the CO<sub>2</sub>-combining power. In emphysema the alkali reserve or CO<sub>2</sub>-combining power may be raised to over 110 vols.%, with a corresponding reduction in the plasma NaCl, and yet the patient, far from having an alkalosis, is hovering on the brink of acidosis. In the van Slyke classification of acid-base balance and its disturbances this condition would be called a compensated gaseous acidosis, which is obviously what it is in spite of the alkali reserve.

These are the important changes in the blood which occur in emphysema: in severe cases there is gross deficiency in both oxygen absorption and CO<sub>2</sub> elimination, and in the milder cases this deficiency is manifest only when the demands of metabolism are increased by exercise. The defect appears to lie in deficient ventilation of the alveoli rather than in any barrier between the alveolar air and the blood.

### Cause of Impaired Haemo-respiratory Exchange

Many explanations of the impairment of aeration of the blood in emphysema have been given, but most of them are based only on conjecture and can be shown to be unsound:

(a) It has been suggested that the respiratory musculature is incapable of properly ventilating the lungs for the same reasons that the vital capacity and chest expansion are diminished; but the blame cannot be placed on the muscles of respiration, as the amount of air drawn into the lungs with each breath and during each minute is normal or even increased in emphysema. Diminution in vital capacity cannot therefore be the cause. The fault must lie in the lungs, as for some reason the air which is inspired does not properly ventilate the blood.

(b) It is obvious that the defect cannot be due to any barrier to the transfer of gases across the pulmonary epithelium, as if this were the cause CO<sub>2</sub> would increase in the blood but not in the alveoli. The fact that changes in the blood are associated with proportionate changes in the alveolar air rules out any suggested possibility of a barrier.

(c) An explanation which is commonly given is that with so many alveoli destroyed there is insufficient functioning lung. Many investigations of haemo-respiratory exchange have been made in patients with pneumothorax, pneumonectomy, and other conditions in which the amount of functioning lung is greatly reduced. Impairment of gaseous exchange, mainly affecting the absorption of oxygen, is found when the reduction in the volume of the lungs is so extreme that the tidal air or the amount of air breathed is diminished (Christie, 1936; Courmand and Berry, 1942). This is in contrast to emphysema, in which there is no diminution in the amount of air inspired and the elimination of CO<sub>2</sub> is impaired to the same extent as the absorption of O<sub>2</sub>. "Diminution of the amount of functioning lung" or "diminution in the respiratory surface" cannot therefore explain the changes observed.

(d) Diminution in pulmonary blood-flow has been suggested as the cause. I have already stated that no such diminution occurs until heart failure supervenes. The amount of air entering the lungs is normal or even increased, so any diminution in pulmonary blood-flow would naturally lead to over-ventilation of the blood and not under-ventilation.

(e) A much more reasonable explanation, and one which is widely accepted on the Continent, is that the air sacs are not properly ventilated—partly because they are big, but mainly because the alveolar ducts are distorted (Beitzke, 1925; Kountz and Alexander, 1934). It is true that in emphysema the sudden transition from narrow alveolar duct to wide atrium is lost in many of the air sacs; and it is claimed that the air is no longer thrown in as a jet and the more distant alveoli are therefore not properly ventilated. This has been named the "stratification" theory, so called because it assumes a gradient of ventilation in the lobule, those parts next to the alveolar duct being over-ventilated and the parts further away being under-ventilated. This sounds reasonable, but the validity of this theory of stratification obviously depends on the assumption that in health there must be circulation of air in the air sacs and alveoli, and that diffusion alone is insufficient to maintain adequate exchange of gases in the lobules. The diffusion of gases is governed by well-defined laws, and it can be calculated that, even if the lobule is 1 cm. in diameter, diffusion alone would ensure the transport of gases across the alveolar space with a gradient of less than 1 mm. of Hg. The details of this calculation, together with other evidence which casts doubt on the stratification theory, have been published elsewhere, and it would appear that defective ventilation of the lobule cannot account for the extreme impairment of gaseous exchange observed in emphysema, in which the pressure of CO<sub>2</sub> may be raised by 30 or 40 mm. of Hg (Christie, 1939).

(f) Increase in the volume of the lungs has been suggested as the cause of impaired ventilation, on the assumption that it is more difficult to ventilate a large room than a small one. It is certainly true that in emphysema the amount of air remaining in the lungs at the end of an ordinary expiration is usually somewhat increased, and this explanation may therefore appear reasonable. Physiologists have paid but little attention to the significance of the amount of air in the lungs,

and I will not discuss the various factors involved. It can be said, however, without fear of contradiction, that, provided ventilation is distributed evenly throughout the lungs and alveoli, an increase in lung volume can in no way impair haemo-respiratory exchange. Increase in lung volume could only diminish the fluctuation in the concentration of alveolar gases which occurs during inspiration and expiration. The simile of the large and small room is fallacious, for if you have the same number of people in the small room as in the large room, and the same amount of air used for ventilation, there will be no significant difference in the atmosphere of the two rooms. In any case, increase in lung volume when it occurs is essentially due to increase in the size of individual lobules, and, as I have already stated, diffusion alone could maintain adequate gaseous exchange in a lobule much larger than the average size in emphysema.

(g) An increase in the respiratory dead space has been suggested as the cause of impaired haemo-respiratory exchange, but there is ample evidence that any increase in the anatomical dead space—i.e., the space occupied by the respiratory passages down to the bronchioles—is too small to be of practical significance (Hoover and Gammon, 1915). I will not enter into a discussion on the meaning of the physiological dead space. Most physiologists will agree that those who claim an increase in physiological dead space in emphysema are merely stating in a complicated way that the distribution of ventilation is unequal. In the normal individual the distribution of ventilation is remarkably even throughout the lungs, and consequently samples of alveolar air taken after expirations of varying depths are more or less uniform in composition. This is not the case in severe emphysema: the deeper the patient expires the higher is the  $\text{CO}_2$  content and the lower is the  $\text{O}_2$  content of the "alveolar air," and these patients show the apparent paradox that, although the amount of air inspired is normal or even increased, the alveoli are under-ventilated. That part of these lectures which deals with the analysis and interpretation of these observations is discussed elsewhere; the conclusion which has been drawn from them is that much of the inspired air is deflected to the enlarged air sacs and bullae, the walls of which are avascular and which are therefore not in contact with the pulmonary circulation. This wastage of ventilation on functionless air sacs cannot be defined as wastage due to increase in physiological dead space, as there is nothing physiological about an emphysematous bulla. Nor can it reasonably be called increase in anatomical dead space. If a definition is wanted I would prefer to give as the cause of impaired haemo-respiratory exchange in emphysema the formation of a pathological respiratory dead space, consisting of bullae and other air sacs which are not in contact with the pulmonary circulation. In very severe emphysema it is possible that all of the inspired air enters this pathological dead space, so that haemo-respiratory exchange would depend mainly on diffusion. In less severe cases it is probable that only some of the inspired air is wasted in this way.

#### Dyspnoea

The cause of dyspnoea in emphysema is clearly stimulation of the respiratory centre by the  $\text{CO}_2$  retained in the blood. Under resting conditions the patient with emphysema either can just get rid of the  $\text{CO}_2$  he is forming or, if not, he can compensate by increasing his alkali reserve; and in either case he is not dyspnoeic, because the acidity of his blood is normal. When he exercises, however, he cannot eliminate the extra  $\text{CO}_2$  he forms; a gaseous acidosis occurs, and dyspnoea must result. In the absence of bronchospasm there is no orthopnoea, because there is no pulmonary congestion, which is the cause of true orthopnoea.

(Part II, concluding the lectures, will appear in next week's issue, with the list of references.)

The urgent need to prepare a new generation of Jewish physicians, especially in view of the tragic extermination of European Jewry, was urged by Prof. Bernhard Zondek of the Hebrew University when he recently opened the annual conference of the Palestine Jewish Medical Association. The conference was devoted mainly to discussing the problem of establishing a world-wide organization of Jewish physicians with its chair in Palestine. It is planned to issue an English edition of the Jewish medical journal *Harefuah* to be distributed among Jewish doctors throughout the world.

## SUPERVISION OF PREGNANT WOMEN IN FACTORY EMPLOYMENT

BY

J. V. O'SULLIVAN, F.R.C.S., M.R.C.P., M.R.C.O.G.,  
M.D., M.A.O.

*Obstetric Surgeon, City of London Maternity, Queen Mary's, and  
Beaumont Memorial Hospitals*

AND

L. B. BOURNE, M.R.C.S., L.R.C.P., D.A.

*Works Medical Officer*

The employment of pregnant women has become of vital importance at the present time, and we think it will be of interest if we record our experience in a factory concerned with a specialized industry (light engineering) in which an ante-natal clinic has been established to supervise women employees. It is realized that the figures are small, but we feel that the time has come for a very careful investigation into all factors connected with pregnancy among industrial workers. To obtain sufficiently large figures from any one industry might take so long that much of the value of the ultimate findings would have lost their importance.

We have attended a total of 178 pregnant women, who have come from North-East London. Of these, 90 have been delivered in the first year—82 in hospital and 8 at home—and the greater number have been followed up after delivery to assess any ill effects. All were employed in such work as soldering, welding, assembling small machine parts, etc. Their heaviest jobs were operating capstan lathes and drills. Some of the workers are engaged in a specialized form of assembly in workshops where the temperature at any time is roughly  $10^\circ$  Fahrenheit higher than normal. A full-time factory medical officer is always at call for emergencies, and there is an adequate staff of State-registered nurses (a proportion of whom are certified midwives), who undertake to deal with normal emergencies of industrial medicine.

#### The Ante-natal Clinic

With the ever-increasing number of pregnancies being reported to the surgery nurses, it was decided—after consultation—that the most satisfactory arrangement would be to set up an ante-natal clinic within the factory. Women reported their pregnancy to the surgery nurses, to the medical officer, to the welfare department, or direct to the midwife in charge of the clinic. Arrangements were then made for their examination and confinement. If they wished to be confined at a hospital—and the larger proportion did—an appointment was made for them, and they were given a covering letter when they went to book at the out-patient department. Having booked a bed and made financial arrangements with the hospital almoner, the women then continued to receive routine examinations at the works ante-natal clinic until such time as they left their employment. One of us (Mr. J. V. O'Sullivan) visited the factory at fortnightly intervals in order to examine these cases. Later, the scheme was enlarged to include the treatment of gynaecological cases. Women from all the factory departments have taken advantage of the scheme, and they include clerical and canteen staffs and cleaners, as well as the factory bench operators referred to above.

Wherever it was deemed necessary, lighter work or shorter hours were advised, and the management put such medical suggestions into immediate practice. We consider this to be of great importance in the supervision of women's health in factories.

We first made a general rule that all patients should cease work at the fifth month of pregnancy, but as time went on we found that most of them wished to continue at their work in later pregnancy, and as they showed no evidence of fatigue or ill-health we permitted them to do so under the special supervision provided. It would appear that so little is the health of experienced workers affected by pregnancy that they continue to work on night shifts without any apparent strain.

It was felt, however, that this was inadvisable, and it is therefore no longer permitted when the patient is known to be pregnant.

All pregnant women, of course, had the advantages of the extra nourishment and vitamins distributed through the Government scheme. The local health authorities have co-operated by allowing us to set up a distributing centre for vitamins and cod-liver oil within the factory. Many women previously complained that they were unable to take full advantage of the Government scheme on account of the time they spent (with consequent financial loss) in travelling to the various centres. The nursing staff have been able to find cases of pregnancy earlier than if these women had reported to outside ante-natal clinics in the usual way.

The management of the firm has permitted secretarial assistance sufficient to arrange for all appointments, admissions, etc., into any hospital chosen by the woman. This is, of course, of particular value in time saved, for she would otherwise have to go and arrange bookings and appointments herself.

### Preparatory Routine

At the ante-natal clinic the usual routine investigations, such as blood pressure, urine testing, etc., were carried out. Originally, routine Wassermann tests were done at the first visit. It was found that this was not wholly satisfactory, as the question of future infection at any given time had to be considered. It was not practicable to carry out a routine Wassermann test at each subsequent visit, and so the present policy is to leave it until there is the slightest suspicious clinical sign. It is the custom to make a routine Wassermann test in all cases of toxæmia of pregnancy (or in any case of an unmarried pregnant woman). In view of the present abnormal living conditions and the breaking up of normal home and family life, the greatest possible vigilance must be exercised by all in attendance on ante-natal patients. We have had only one positive reaction in 43 cases to date. Clinical signs had suggested this, and the W.R. confirmed the necessity for treatment. We would stress the absolute necessity that the test be done by pathologists who have specialized in this field. All our pathological investigations and x-ray examinations are carried out at one of the large general hospitals.

We feel, at the end of the first year, that this clinic has been of great assistance to the working pregnant women in the factory. It has saved them time and money, and many working hours.

A pregnant patient generally reports to the surgery in the unit in which she is working. The sister-in-charge communicates with the sister in charge of the ante-natal clinic, and an appointment is arranged convenient to the patient and to the demands of routine of the shop in which she works. At the interview with the sister at the clinic full particulars are taken, the patient's local practitioner is informed that this patient has sought advice, and she is then booked to see the consultant at his next visit. Records are kept of all findings, and of the patient's general condition, the type of work she is doing, and her financial position. She is provided with simple instructions as to her personal care, hygiene, feeding, etc. Next a bed is booked for her at the hospital of her choice. Some hospitals prefer to see the patient once early in pregnancy, and then return her to the works clinic. Later in the pregnancy she returns to the hospital with full records as to her progress while she is under our care. After the patient is delivered, she is followed up by the department as to her general health and the possibility of returning to work, and is given information as to day nurseries in her district, etc. Co-operation from the welfare department is whole-hearted, and in this way the patient can be afforded financial assistance or can be permitted to take advantage of all schemes at present available.

### Employment Restrictions

The College of Midwives in Dec., 1940, issued a leaflet on the "Restriction of Employment of Women Before and After Childbirth." In this it suggests: (1) four weeks' rest before the expected confinement; (2) eight weeks' absence from the factory after the birth of the child. (The period permitted under the Public Health Act, 1936, is four weeks.). The College

believes that much could be done to make the position of pregnant women easier, particularly as regards financial assistance by the State. It is of interest to note that the proposals adopted at the General Conference of National Labour Organizations of the League of Nations convened at Washington by the Government of the United States of America on Oct. 29, 1919, which binds the countries that ratify it to prohibit the employment of women six weeks before and six weeks after childbirth, and to make provision for their maintenance, was never ratified by the British Government. So far as this country is concerned, there seems to be no standard laid down for the care of working women who become pregnant. The issue of the College of Midwives leaflet was advisory only, and no further steps have been taken by any of the authorities.

The Union of South Africa has dealt with this question through a Factory Act which includes provisions far beyond those in force in this country.\* In Germany, too, it appears that the Reich Ministry of Labour ensures the protection of all female workers. It prohibits the employment of pregnant and nursing mothers on jobs which might prove harmful to them. Every woman must be completely exempt from every kind of work for six weeks before and six weeks after the birth of a child. This period is increased to eight weeks in the case of nursing mothers. The nursing of children is encouraged by the granting of a paid nursing period. The law prohibits the employment of pregnant and nursing mothers on overtime, night work, and holiday work. It also extends protection against dismissal. It is a punishable offence to dismiss a woman because of pregnancy, and she must not be given notice of dismissal for other reasons from the beginning of pregnancy until four months after childbirth. Unfortunately this law was modified to apply only to women of German nationality, and with a few exceptions it did not include Poles, Jewesses, Gypsies, etc., who were working under forced labour conditions in the German factories. All they were permitted to do was to refuse to continue to work if they could prove they were likely to be confined within the next two weeks, and they were allowed freedom from employment for six weeks after confinement. It seems likely that the majority of the foreign women working in Germany worked until 8½ months pregnant. The conclusion one can draw from this is that Germany valued female labour, and particularly the breeding of healthy offspring.

At the present time there seems to be no special standard laid down for the care of working women who become pregnant, apart from the above. When pregnant women are employed it is of vital importance that they be carefully supervised by experts, and only under these conditions is it fair to allow women to continue to work in factories in the later months of pregnancy. Our experience shows that no women have come to any apparent ill-health during their pregnancy or labour from doing work in this factory. We think this point is of great importance in the present emergency, because many of the women are highly skilled in their work, which they have been doing for years. Labour wastage cannot be made good; it is a great hindrance to production, for it often takes many months before the unskilled new entrant to industry becomes relatively useful as a producer. If, therefore, women can be kept at work for a longer time in the factories without in any way injuring their health, the value to industry must be great; but the fact that working women must undertake

\* Factories, Machinery and Building Work Act of 1941 for the Union of South Africa; Chap. III, Par. 23, subsections (1) and (2):

"(1) No female shall work in a factory and no employer or occupier shall require or permit any female to work in his factory during the period commencing 4 weeks prior to the expected date of her confinement and ending 8 weeks after the date of her confinement. Provided that, if the child be stillborn, or dies before the expiration of 8 weeks after birth, the provisions of this subsection shall cease to apply as from a date fixed by an inspector.

(2) The Minister may from public moneys pay to any female who, in circumstances to be determined by him, has discontinued her work in a factory as a result of pregnancy, an allowance equivalent to her ordinary weekly remuneration, but not exceeding 25s. per week, for a period not exceeding 12 weeks, which allowance may be paid in lump sum or in such instalments as the Minister may determine: Provided that payment of such allowance may be made in respect of an additional period not exceeding 4 weeks if such female discontinued her work in a factory as a result of pregnancy more than 4 weeks prior to the expected date of her confinement."

manifold household duties, etc., after their day at the factory must also be taken into consideration.

We are not in a position to refer to the employment of pregnant women except in the special factories in which we have worked. We feel that co-ordination between employers of labour, trade unions, and Ministries should now be forthcoming, so that a general scheme for rationalizing the position of pregnant women in industry may be worked out for the whole country.

#### Analysis of Cases

TABLE I

No. of patients, 90 (68 primiparae, 22 multiparae):				
Group 1 (under 20 years)	..	10		
" 2 (21-25 years)	..	36 (31 primiparae; 5 multiparae)		
" 3 (26-30 years)	..	27 (20 " 7 " )		
" 4 (31-40 years)	..	15 (6 " 9 " )		
" 5 (over 40 years)	..	2 ( " 2 " )		

TABLE II.—Periods of Pregnancy at which the Women ceased Factory Work

Weeks of Pregnancy	Group 1		Group 2		Group 3		Group 4		Group 5		Totals
	M.	P.	M.	P.	M.	P.	M.	P.	M.	P.	
18											5
20		1		3		2					8
22			1	3		1		1	1		1
24				2		4		2			7
26				7	1			4	1		15
28		3		8	3	6	3				24
30			1	2	1	2	1				7
32		1		3		3					7
34		2	1	2	1	1	1	1			9
36		3	1	1	1		1				7
Totals	10		36		27		15		2		90

Of the series of 90 cases, 77 confinements were normal, 80 had normal pregnancies, and 87 had an uneventful puerperium. There were 7 cases of toxæmia (including 2 cases of primary hypertension), 2 cases of puerperal pyrexia, 1 case of severe anaemia (below 50%), 9 cases with haemoglobin between 50 and 60%, 38 with haemoglobin between 60 and 75%, and 42 with haemoglobin above 75%. Abnormal labours comprised 1 Caesarean section and 4 forceps; premature labour—2 premature (1 stillbirth of 3 lb.) and 2 breeches. Breast-feeding was established in 77 cases out of a total of 90.

#### Conclusions

Ante-natal clinics in factories where pregnant women are employed are very advisable under present conditions.

Where insufficient numbers in any one factory render this impossible, clinics to cover groups of factories in an area might be established.

Under medical supervision many women can do suitable work to an advanced stage of pregnancy.

Nursing mothers should not recommence work (particularly the baby is breast-fed) for at least three months after delivery.

Day nurseries must be established if a return to work becomes necessary.

A national scheme should be set up to supervise employment of pregnant women and investigate the possibility of increased financial benefits.

We wish to express our gratitude to Sister W. M. Brown, who did much of the original work in establishing the clinic and making the arrangements with local authorities and the hospitals concerned. We must also express our thanks to the City of London Maternity, St. Mary's Islington (L.C.C.), the Royal Free, the Royal Northern, and other hospitals, and also to the municipal midwives who have co-operated so whole-heartedly in the scheme.

M. H. Shulman (*New Engl. J. Med.*, 1942, 226, 260), impressed with the results in epilepsy of sodium diphenyl hydantoinate, and because of recent work on the psychogenic aspect of bronchial asthma, has tried the drug on six or seven patients suffering from severe asthmatic attacks. The proprietary preparation, dilantin sodium, gave pronounced relief in his small patients aged between 5 and 14 years. He observes that the drug must be given continuously to prevent attacks. In some of these patients the personality was improved.

## FIVE CASES OF JAUNDICE FOLLOWING TRANSFUSION OF WHOLE BLOOD OR HUMAN PLASMA

BY

R. E. STEINER, M.B.

(From an E.M.S. Hospital)

In the last few months 5 cases of jaundice have been observed in this hospital. It was found that these patients had all received transfusions and some time later developed the disease. A similar occurrence has been recorded previously by other writers: Morgan and Williamson (1943) reported 9 cases of jaundice following the administration of human blood products, and Besson (1943) recorded 7 cases of delayed jaundice in subjects who had received blood or plasma transfusions. It seemed, therefore, to be of importance to report the present cases.

Our patients were battle casualties from North Africa, and had been admitted to this hospital from two to three months after having been wounded; they then developed jaundice. All of them had had transfusions of whole blood, human plasma, or both, in varying quantities. The treatment in every case was primarily some form of surgical intervention plus chemotherapeutic measures such as antitetanic and anti-gangrene serum and massive doses of the sulphonamide group of drugs.

#### Case I

Male aged 23; sustained multiple shrapnel wounds of both legs on April 7, 1943. A transfusion of 500 c.cm. of whole blood, followed by 2,500 c.cm. of plasma, was given on the same day. Jaundice was noticed for the first time three months after injury, the patient having had very slight prodromal symptoms of nausea and headache for some days. Thereafter he felt perfectly well. The jaundice deepened considerably during the first three days, was then stationary for one week, and disappeared in the next two weeks.

Physical examination showed slight tenderness on deep pressure over the right subcostal region for a week after the onset of jaundice; the liver and spleen were never palpable, and the temperature and pulse remained normal throughout the illness.

**Laboratory Findings.**—Blood count: Normal during the course of the illness, except for a mononucleosis of 8%. Urine: There was never bile in the urine, but excessive urobilin was present. Faeces: Stercobilin diminished. Van den Bergh: Direct positive reaction; quantitative indirect, 2 mg. per 100 c.cm.

#### Case II

Male aged 28; wounded by a machine-gun bullet in the left thigh on April 11, 1943. A plasma transfusion of 3,000 c.cm. was given on the same day. Three months afterwards he developed loss of appetite and headache, which were followed by jaundice two weeks later. The jaundice deepened steadily over the first week, then became stationary for two weeks; after four weeks only a very faint trace was noticeable. The appetite returned about one week after the onset.

Physical examination after the appearance of jaundice revealed a just palpable liver, which was not tender. The spleen was never palpable. The temperature was slightly raised for the first week of the illness; the pulse remained normal.

**Laboratory Findings.**—Blood count: Normal during the illness. Urine: Slight trace of bile, large amount of urobilin for four weeks. Faeces: Very much diminished stercobilin for 17 days. Van den Bergh: Prompt positive direct after the first week; quantitative indirect, 4.2 mg. per 100 c.cm.

#### Case III

Male aged 21; sustained multiple shrapnel wounds on May 9, 1943. A transfusion of 1,000 c.cm. of whole blood was given on the same day. Jaundice was first noticed three months after the wounding. The patient had no symptoms or



signs up to the second day after the onset, when he developed nausea, anorexia, slight abdominal pain, and vomiting. The jaundice deepened during the first week; it remained stationary for some days, and then began to fade until only a faint trace was observed eight days later.

Physical examination revealed a palpable liver one week after the onset of jaundice, and there was slight tenderness on deep pressure in the right subcostal region. The patient was slightly febrile for the first 10 days of the illness, the pulse rate was slow, and the blood pressure slightly below normal.

**Laboratory Findings.**—Blood count: During the first week normal apart from a mononucleosis of 10% and slight irregularity of red cells. Urine: From the first day of the disease there was excessive urobilin; this gradually diminished, until there was only a trace three weeks after the onset. Faeces: No bile pigments: full of fatty acids for the first week.

#### Case IV

Male aged 36; wounded by shrapnel and machine-gun bullets in the right arm and both legs on March 18, 1943. He received five transfusions between March 21 and April 14—in all, 3,500 c.cm. of whole blood and 250 c.cm. of plasma. Jaundice was first noticed four months after the injury. Two days previously he had had a slight chill and a moderate elevation of temperature, accompanied by generalized aching pains. Then followed a severe illness of two weeks' duration characterized by general malaise, headache, slight abdominal discomfort, anorexia, frequent vomiting, and drowsiness. The jaundice deepened considerably during the first week, then remained unchanged for two weeks, and after another 10 days only a faint trace was recognizable.

Physical examination during the first week of the illness revealed a slightly enlarged liver with moderate tenderness in the right subcostal region. The spleen was never palpable. After the second week the liver was no longer palpable. The pulse was very rapid—120–130 before the onset of the jaundice; it then settled down to 80–100.

**Laboratory Findings.**—Blood count: Normal during the first two weeks of the illness apart from a mononucleosis varying from 3 to 16%; moderate anisocytosis and poikilocytosis. Urine: No bile; excess of urobilin. Faeces: Diminution of stercobilin. Van den Bergh: Prompt direct positive; quantitative indirect, 8 mg. per 100 c.cm.

#### Case V

Male aged 24; received multiple shrapnel wounds in the left leg and chest on March 17, 1943. Transfusion of 500 c.cm. of whole blood was given on March 22. Jaundice was noticed for the first time two months after the wounding. There had been slight abdominal pain and anorexia for two weeks before the onset. He suddenly became very ill on the appearance of the jaundice, which deepened on the second day, and he complained of severe abdominal pain mainly in the subcostal region, incessant vomiting, and headache. At first he was very restless; then gradually he became drowsy and comatose, and died two days after the onset of jaundice.

Physical examination during the last two days of the patient's illness revealed that the liver and spleen were not palpable. The temperature was slightly elevated, the pulse rapid, and the blood pressure normal at first, gradually becoming very low.

**Laboratory Findings.**—Blood count: The blood picture was normal; there was a slight leucocytosis, with toxic granulations of polymorphs. Urine: Faint trace of bile and bilirubin. Faeces: Slightly diminished stercobilin. Van den Bergh: Slightly delayed positive direct; quantitative indirect, 1.8 mg. per 100 c.cm.

**Post-mortem Findings.**—There was generalized jaundice, with haemorrhages into the serous membranes. Other findings of significance were:—Liver: 32 oz. It had a soft yellow mottled surface, and on section showed irregular yellow patches on a dark red background. Microscopical examination revealed complete destruction of liver cells. The only normal-staining elements were the bile ducts, which were loaded with pigment. Some of the liver cells were greatly swollen and pigmented; the others were reduced to a small necrotic mass and were separated from one another. The capsule was wrinkled. Spleen:  $7\frac{1}{2}$  oz.;

moderately enlarged; diffuent and dark red. Histological examination showed the sinuses to be congested. There was widespread blood pigment, both free and in macrophages. Kidneys: Together 12 oz.; flabby; cortex dull, opaque, and swollen, stained dull faint yellow. Microscopically a great degree of swelling of convoluted tubules was seen.

Table showing Details of Cases

Case	Age	Date of Transf.	Amount of Transf. (c.cm.)		Onset of Symptoms	Interval in Days	Date of Recovery
			Blood	Plasma			
I	23	7.4.43	500	2,500	3/7/43	87	26/7/43
II	28	11.4.43	500	3,000	18/7/43	95	16/8/43
III	21	9.5.43	1,000		31/8/43	114	23/9/43 Still faint trace of jaundice 3/8.43
IV	36	21.3.43 23/3/43 24.3.43 29.3.43 14/4/43 22/3.43	500 500 500 1,200 850 500	250	10/7.43	111	
V	24	22/3.43	500		27.5.43	66	(Died 29/5/43)

#### Discussion

The clinical picture in the five cases described resembled in many ways catarrhal jaundice or infective hepatitis. Generally speaking, it was a slightly febrile illness, with symptoms of nausea, anorexia, slight abdominal discomfort, vomiting, and signs of jaundice, liver enlargement, and tenderness in the right subcostal region. There were, however, some factors which are not usually seen in catarrhal jaundice. In three of the cases there was a definite lack of free bile in the urine, with an excessive amount of urobilin present. In some of the cases—e.g., I, III, IV—there was a marked mononucleosis.

The aetiology of the illness described in these five cases is unknown, and it is impossible, in view of the lack of information about the incidence of jaundice among the untransfused troops in North Africa, to assess the statistical certainty of a connexion between the transfusion and the illness. Nevertheless, the fact that of 245 cases from North Africa, of which approximately 45% had transfusions, 5 developed jaundice while not one of the untransfused cases developed it suggests a connexion between the two. Outbreaks of an illness resembling catarrhal jaundice following inoculation of groups of people with human plasma, serum, or lymph have previously been recorded.

Some aetiological significance must be attributed to (1) the temporal coincidence of the transfusions—within three weeks in four cases—as shown in the accompanying table; and (2) the fact that jaundice has been observed only in our casualties from North Africa and not in those from other theatres of war. It would therefore appear that, while the transfusion may be the cause of the jaundice, certain special circumstances must be attendant on the transfusion before jaundice is produced.

#### Summary

Five cases of jaundice developing two to three months after transfusion have been reported. It is suggested that the transfusion is the cause of the illness. The limited incidence of this complication has been pointed out.

I would like to thank Mr. C. H. Cullen, who is in charge of these cases, and also Drs. J. Doupe and Mary Sharpe, for their help and criticisms.

#### REFERENCES

- Beeson, P. B. (1943). *J. Amer. med. Ass.*, 121, 1332.  
Morgan, H. V., and Williamson, D. A. J. (1943). *British Medical Journal*, 1, 750.

J. B. Hartzell and W. L. Stone (*Surg. Gynec. Obstet.*, 1942, 75, 1), in an experimental investigation into wound healing, found that this was retarded in guinea-pigs kept on a subcurry diet. In animals operated upon while in a subcurry state, and given high doses of vitamin C, the wounds reached the same degree of tensile strength as in normal animals by the eighth post-operative day. Histological studies showed that the low tenaciousness of wounds in vitamin-C-deficient animals was due to a failure of collagen.



## HISTOLOGICAL EFFECTS OF SULPHONAMIDE-PROFLAVINE MIXTURES IN THE RABBIT

### SOME EXPERIMENTAL OBSERVATIONS

BY

DOROTHY S. RUSSELL, M.D., Sc.D., M.R.C.P.

AND

DIANA J. K. BECK, F.R.C.S.

(Working for the Medical Research Council)

Nuffield Department of Surgery, Oxford

The widespread use of sulphonamide powders in the treatment of wounds has prompted the idea that other substances—notably the acridine antiseptics—might be applied in a similar manner. Thus Mitchell and Buttle (1942, 1943) have claimed beneficial effects from the use of proflavine and disflavine in war wounds. Experiments have shown, however, that acridine powders have a highly destructive effect upon the tissues (Russell and Falconer, 1943; Hawking, 1943). The use of these powders in undiluted form in the treatment of fresh wounds therefore seems undesirable, though they are not of necessity contraindicated for secondarily infected wounds which have failed to respond to other therapeutic measures.

A substantial dilution of proflavine with one of the sulphonamides might be considered a suitable mixture for the prophylactic treatment of wounds, and a blend of one part of proflavine powder in 100 or 200 parts of sulphathiazole has been suggested by McIntosh and Selbie (1943), who find that proflavine is more potent than the sulphonamides in infections with some of the gas-gangrene organisms. Sulphathiazole powder has been found by Glynn (1942) to have a negligible damaging effect upon the tissues in experimental wounds, and in this respect is preferable to either sulph-anilamide or sulphapyridine.

The present experiments demonstrate in rabbits the effects of proflavine-sulphonamide mixtures upon (a) muscle and subcutaneous tissues, and (b) the brain.

#### Muscle and Subcutaneous Tissues

In this group the powder tested was composed of 1 part of proflavine sulphate and 99 parts of sulphathiazole. The experiments were similar to those described by Glynn. Under ether anaesthesia an incision 1 to 2 cm. long was made in the depilated skin of the thigh, and a pocket (about 2.5 cm. diameter), made between the panniculus carnosus and the skeletal muscle by introducing and opening the blades of blunt scissors, was filled with about 0.25 g. of the powder. The wound was then closed. The disk of blood-clot also inserted Glynn was omitted. Six rabbits were treated in this way.

phathiazole alone being introduced into the left leg, and a mixed powder into the right. The animals were killed after 1, 2, 4, 8, 10, and 16 days respectively.

#### MACROSCOPICAL CHANGES

The site of operation in general appeared swollen and felt boggy for the first few days after operation. In four of the animals the right side was considerably more swollen than the left, and in one of these slight oozing of clear yellowish fluid was observed on the third day at the point where a stitch had been lost. From the fourth day onwards this wound was dry and the inflammation subsided. In the remaining two animals the left leg showed the greater swelling. All wounds appeared to heal in a normal manner with the single exception mentioned.

When the block of tissue including the operation area had been excised, fixed in formaldehyde, and sliced, the powder was identified as a lenticular, cheesy mass about 2 cm. in diameter and 0.3 or 0.4 cm. thick, which decreased with time and was reduced to a linear streak by the eighth day. With pure sulphathiazole the changes in the surrounding tissues were limited to slight oedema on the first day, with traces of haemorrhage in the adjacent fasciae and deep aspect of the skin. With the mixed powder there was on the first day severe oedema with diffuse haemolytic staining of the deep aspect of the skin, extending from the site of operation to the base of the tail and involving the fascia covering the skeletal muscle for a distance of 1 cm. from the pocket. On subsequent days the staining of the fascia was replaced by petechial haemorrhages, which similarly extended for distances up to 4 cm. from the site of opera-

tion. There was a zone of discoloration up to 2 mm. deep in the skeletal muscle, varying from yellow on the first day to brownish pink or yellowish grey in later stages. Oedema of the adjacent tissues, and particularly of the skin, persisted up to the sixteenth day over the pocket, which was replaced after the eighth day by a lenticular mass of gelatinous greyish-yellow material.

#### MICROSCOPICAL CHANGES

1. *With sulphathiazole alone* oedema of the dermis, panniculus carnosus, and the deep fascia was conspicuous at first, but had almost disappeared by the fourth day. Most of the powder had been absorbed by the fourth day, but a few crystals were found on the tenth. The site of the powder beneath the panniculus carnosus was identified by a capsule of closely felted filaments of fibrin, which became increasingly folded as the space collapsed. By the fourth day this capsule was sparsely infiltrated by polymorphonuclear leucocytes and large mononuclear cells, and immediately about it lay a thin zone of proliferating fibroblasts. By the eighth day the capsule was broken at many points by the ingrowth of granulation tissue, which lined most of the enclosed space (Fig. 1). The

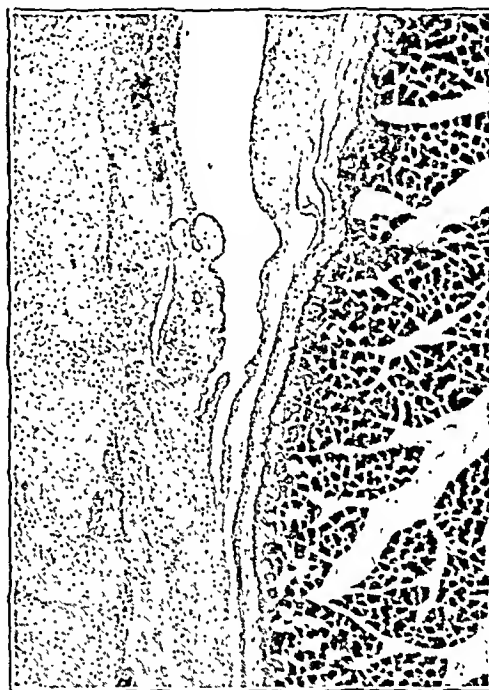


FIG. 1.—Border of skeletal muscle and lateral angle of pocket 8 days after insertion of sulphathiazole powder. The borders of the pocket are replaced by granulation tissue. H. and E.  $\times 21$ .

appearances were similar on the tenth day, but by the sixteenth day all traces of the cavity had been obliterated by collagenous tissue. The panniculus carnosus immediately over the pocket was involved by the formation of granulation tissue, but the muscle fibres, though separated, did not undergo degeneration or necrosis. The subjacent skeletal muscle of the thigh showed slight oedema in early stages but underwent no degeneration in any instance.

2. *With sulphathiazole-proflavine mixture* the histological changes differed from those which followed the introduction of sulphathiazole alone, first, in the persistence of local oedema up to the sixteenth day; secondly, in the conspicuous development of haemorrhagic necrosis in the dermis, the panniculus carnosus, the subjacent skeletal muscle and its fascia (Fig. 2); and, thirdly, in the consequent retardation of healing in these layers although the skin incision healed as rapidly as in the controls. Thus the panniculus carnosus was completely necrotic throughout the length of the section (2.5 cm.) in the animal killed after one day, and the necrosis extended laterally for a similar distance in the subjacent fascia, which was greatly swollen. Yet the zone of necrosis in the skeletal muscle was no deeper than about 1 mm., and in two of the animals was limited to the most superficial fibres. The extent of necrosis about the pocket of powder resulted in a retardation of healing. Thus granulation tissue did not appear until the eighth day; it then occupied the deep border of the subjacent necrosed skeletal muscle and the surface of the deep fascia over it lateral to the pocket, while tongues of young fibroblasts penetrated through the subcutaneous tissue to within 2 mm. of the fibrin capsule about the pocket. Even by the sixteenth day the fibrin capsule persisted at many points, especially along the superficial border towards the dermis.

## COMMENT

The histological effects of sulphathiazole powder alone are thus negligible, confirming the observations already made by Glynn. A mixture of proflavine sulphate and sulphathiazole (1:100) is substantially damaging to muscle and connective tissue: necrosis and haemorrhage are widely distributed along fascial planes and in loose connective tissue, but the penetration of solid masses of muscle appears very limited.

Since these observations were made some parallel experiments on rats have been reported by Selbie and McIntosh (1943). They inserted about 10 mg. of similar powders beneath the panniculus carnosus of the abdominal wall on either side of the mid-line. The area exposed to the powders was of similar dimensions to that in our experiments. The histological results in these rats appear to have resembled those obtained by us in the rabbit except in two particulars. First, the

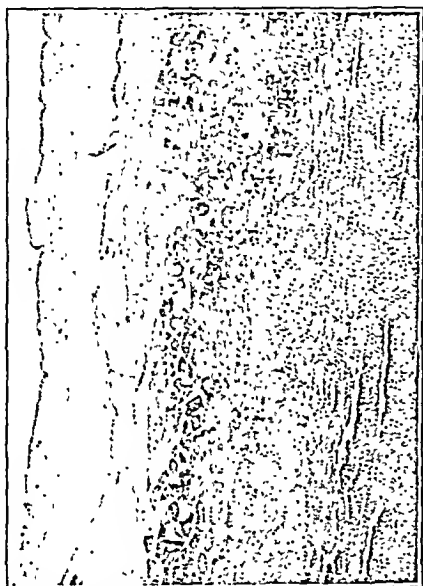


FIG. 2.—Same animal as in Fig. 1, showing necrosis of skeletal muscle and fascia over it 8 days after insertion of proflavine-sulphathiazole mixture. H. and E.  $\times 21$ .

panniculus carnosus in the rat underwent the same degree of necrosis following exposure to both kinds of powder. Secondly, no retardation of healing was observed in the rat in comparison with the areas treated by sulphathiazole alone, in spite of the apparently greater damage inflicted by the proflavine mixture. To some extent these divergences might be attributable to the use of different animals and different sites. But more important, probably, is the difference in the severity of the test. Thus in the experiments of Selbie and McIntosh a much smaller quantity of the powder was dispersed in a thin film between the muscle layers, while we, following Glynn, inserted enough powder to form a lenticular mass several millimetres thick. The observed difference in the two series is a warning against the use of excess of the proflavine-sulphathiazole mixture.

## Central Nervous System

Sulphapyridine was substituted for sulphathiazole in these experiments on account of the known epileptogenic effects of the latter. In a few animals sulphadiazine was used. Craniotomy was performed on 28 rabbits, the technique being the same as in earlier experiments (Russell and Falconer, 1943). Details are given in the Table.

The animals were killed at either 2 or 4 days after the operation. During this period weakness of the right limbs and excitability were noticed in both animals in Group 1, and to a less marked extent in a variable number of animals in all the other groups.

*Pathological examination* showed a lack of uniformity in the reaction of the meninges and brain in the exposed area. In Groups 1 to 3 inclusive a proportion of the animals, as shown in the Table, exhibited a haemorrhagic necrosis that

Group	Mixture Used	No. of Animals	Severe Reaction
1	Proflavine sulphate - sulphapyridine, 1:25	2	1
2	" " " " " 1:50	7	3
3	" " " " " 1:100	9	3
4	" " " " " 1:200	7	0
5	" " " " " sulphadiazine, 1:200	3	1

extended down to the wall of the lateral ventricle. In the rest the reaction was limited to focal meningeal haemorrhage and oedema of the cortex, accompanied by severe degeneration, with or without necrosis, of a superficial zone not exceeding 1 mm in depth. In Group 4 this zone did not exceed 0.5 mm. In depth, and the reactions in this group were thus of a more consistent character though somewhat variable.

No satisfactory explanation of these uneven results can be offered. Examination of the powder under low powers of the microscope suggested that uneven distribution of the proflavine particles might be responsible, but regrounding the mixture in an agate mortar, and trials of specially prepared samples kindly provided by Messrs. May and Baker Ltd., made no obvious difference to the results. Nor did accidental trauma to the brain during the operation appear to be a factor. Thus superficial trauma, due to a bleeding vessel or to a small abrasion, was noted in five of the animals. In two of these the ultimate damage to the brain was found to be severe: in the other three it was slight. Small variations in the amount of powder used might be regarded as a possible cause, but in one of the animals in Group 3 an excess of powder was deliberately applied, and in this animal the damage was limited to marginal oedema, haemorrhage, and necrosis, together less than 1 mm. deep. We are thus left with the unsatisfactory suggestion that variations in the results are due to factors inherent in the individual. It is nevertheless clear, as indicated in the Table, that the incidence of a severe reaction falls with a diminishing proportion of the proflavine used in the mixture.

## Conclusions

The first group of experiments here reported confirms previous observations that the insertion of substantial amounts of sulphathiazole powder into clean incised wounds is harmless to the tissues. Similar amounts of a powder consisting of 1 part of proflavine sulphate to 100 parts of sulphathiazole caused considerable damage to the neighbouring muscle and connective tissues, though the penetration of the proflavine into solid masses of muscle appeared to be slight and rather uneven.

The experiments on the rabbit's brain with mixtures of proflavine and sulphapyridine powders indicate a similar damaging effect of the proflavine, though the results in this group are not so clear-cut. Mixtures containing only 0.5% of proflavine sulphate are appreciably less damaging than those with higher percentages of this compound. Comparison with earlier experiments shows that both proflavine solutions (1:1000) and sulphonamide powders are preferable from the standpoint of histological effect.

It is a pleasure to thank Prof. J. A. Gunn for providing accommodation for the animals. Our expenses were defrayed by a special grant from the Medical Research Council, and the work was carried out on behalf of the Council's War Wounds Committee.

## REFERENCES

- Glynn, L. E. (1942). *J. Path. Bact.*, 53, 153.  
 Hawking, F. (1943). *Lancet*, 1, 710.  
 McIntosh, J., and Selbie, F. R. (1943). *Ibid.*, 1, 793.  
 Mitchell, G. A. G., and Buttle, G. A. H. (1942). *Ibid.*, 2, 416.  
 ——— (1943). *Ibid.*, 2, 287.  
 Russell, D. S., and Falconer, M. A. (1943). *Ibid.*, 1, 580.  
 Selbie, F. R., and McIntosh, J. (1943). *J. Path. Bact.*, 55, 477.

The National Institute for the Blind in its 74th annual report records a year of remarkable activity among the hundreds of sightless physiotherapists trained at the Institute's School of Massage and now engaged in the work professionally. At the clinics attached to the London headquarters there have never been so many patients in attendance or so many treatments given. The numbers at the evening clinic were respectively 7,610 and 14,117 as compared with 5,185 and 9,859 in the previous year; and at the Eichholz Clinic, which is now recognized as a fracture clinic by the Ministry of Health, they were 4,800 and 11,616, as against 2,972 and 7,657.

## VACCINATION AGAINST TYPHUS FEVER

BY

JOHN B. PENFOLD, M.B., B.S.

*Emergency Pathological Service Laboratory, St. Andrew's Hospital, Billericay, Essex*

The incidence of agglutinins for *Proteus* OX 19, OX 2, and OXK in the British population has rarely been investigated. It was reported in the Monthly Bulletin of the Emergency Public Health Laboratory Service (Aug., 1942, p. 6) that in 100 "normal" sera no agglutination was obtained with any of the three suspensions above 1/128 dilution. The titres for OXK were approximately double those found for OX 19 and OX 2, and it was suggested that titres of 1/80 or over with OX 19 are unlikely "in the absence of exposure, either recent or remote, to typhus infection." Approximately nine-tenths of these sera showed a titre of 1/16 or less with the OX 19 and OX 2 suspensions.

There is only one report from this country on vaccination against typhus fever and its effects on the Weil-Felix reaction. Felix (1942), in a report to the Medical Research Council, gave briefly the alterations in the OX 19 agglutinin titre evoked by various vaccines. Considering 100% or greater increase in agglutinin titre as significant, very variable results were found with both the type and the batch of vaccine used. With vaccines of the Cox type the proportion showing a significant rise in titre varied with the batch of vaccine from approximately 5 to 50%.

## The Present Investigation

In the investigation now reported a vaccine prepared by the Connaught Laboratories, Toronto, from a European louse-borne strain of *Rickettsia prowazeki* grown in the yolk-sac of chick embryos (Cox, 1938) was used. It was issued on Nov. 4, 1941, and with a batch of vaccine of the same date Felix obtained a significant increase in OX 19 agglutinin titre in about half of those inoculated. Twenty-three public health workers were vaccinated and their Weil-Felix and clinical reactions were investigated. At weekly intervals each received 0.25 c.c.m., 0.5 c.c.m., and 1 c.c.m. of vaccine subcutaneously, and three months later a fourth dose of 1 c.c.m. Samples of blood were obtained on four occasions: (1) before the first injection; (2) a fortnight after the third injection; (3) before and (4) a fortnight after revaccination; these were tested for OX 19, OX 2, and OXK agglutinins. The method used in the Weil-Felix test was as follows:

Concentrated suspensions of OX 19, OX 2, and OXK, prepared at the Standards (M.R.C.) Laboratory, Oxford, were diluted 15 times and added in equal quantity to serial serum dilutions, the final dilutions of serum being 1/5, 1/10, 1/20, 1/40, 1/80, 1/160, 1/320, and 1/640, while that of the suspension was 1/30. All tubes were incubated at 56° C. for 4 hours, and the test was read after standing at room temperature overnight; the last tube showing standard agglutination was taken as the titre.

Before vaccination the titres for OX 19 and OX 2 in the cases were all 1/20 or less, the majority showing no titration at 1/5. With OXK, 20 out of the 23 showed titres ranging from 1/20 to 1/160, the commonest being 1/40. No higher titre was observed.

## Relation of Agglutinin Titres at Various Stages to the Number of Cases

Suspensions	Titre	Before Vaccination	Number of Cases		
			2 Weeks After Vaccination	3 Months After Vaccination	2 Weeks After Revaccination
OX 19	0 to 1/10	20	10	15	4
	1/20 to 1/160	3	13	8	19
OX 2	0 to 1/10	22	13	21	11
	1/20 to 1/80	1	10	2	12
OXK	0 to 1/40	15	1	21	18
	1/80 to 1/640	8	22	2	5

Vaccination in the majority of cases resulted in an increase in titre of the three agglutinins. Three months later they had decreased, but not to the pre-inoculation level. After revaccination the OX 19 and OX 2 agglutinin titres rose again, the

former above and the latter to the level recorded after primary vaccination, while the OXK titres were not appreciably altered. These results are tabulated below by correlating the number of cases with the agglutinin titres of their sera.

Even after revaccination the highest OX 19 agglutinin titre was 1/160 (1 case), and OX 2 was 1/80. If more than 100% increase in OX 19 agglutinin titre is taken as significant, 14 cases out of 23 (61%) showed it after primary vaccination and 17 (74%) after revaccination.

Reactions to the injections were as a rule quite slight, and diminished in severity with each additional injection. General reactions, such as occasional malaise, headache, drowsiness, and muscular pains, were less frequent than local reactions, which presented as areas of erythema, swelling, and stiffness, usually starting 12 to 24 hours after the injections and lasting a day or two.

## Summary

Twenty-three people were vaccinated with a Cox vaccine against typhus fever and revaccinated three months later.

The Weil-Felix reactions on these individuals showed low normal agglutinin titres, which were increased after vaccination, and, in the case of OX 19, after revaccination.

The reactions to the vaccine were slight.

I wish to thank the Medical Research Council for the supply of vaccine and Prof. S. P. Bedson for his helpful advice.

## REFERENCES

- Cox, H. R. (1938). *Publ. Hlth. Rep., Wash.*, 53, 2241.  
Felix, A. (1942). *British Medical Journal*, 2, 597.

## TREATMENT OF PEDICULOSIS CAPITIS

BY

ERIC BLACKSTOCK, M.D., B.Sc., D.P.H.

*Venerable Diseases Officer, Birkenhead County Borough*

Coincident infestation of the skin by *Sarcoptes scabiei* and of the scalp by *Pediculus humanus capitis* has become more common among patients attending the scabies clinic in Birkenhead. From the table given below one can see the steep rise in lousiness recorded in school-children during routine cleanliness inspection; it also gives a fair indication of the increase in lousiness of many families in the borough. It is not an uncommon sight to find children's scalps in an unbelievably filthy condition, with lice present in thousands.

## Results of Cleanliness Inspections carried out by the Health Nurses in the Elementary Schools, 1938-43

Year	No. on School Rolls	No. with Nits	No. with Vermin	Total No. Unclean
1938 .. ..	20,101	2,499	253	2,808 (13.9%)
1939 .. ..	19,519	2,781	89	2,959 (15.16%)
1940 .. ..	14,989	1,857	146	2,086 (13.92%)
1941 .. ..	11,753	1,863	107	2,141 (18.22%)
1942 .. ..	14,398	2,412	115	2,871 (19.94%)
1943 (Jan.-June 30)	14,999	2,420	388	3,026 (20.17%)

These figures refer to the number on the rolls of the elementary schools at the end of the December term of each year, except in the case of 1939, the figures for which refer to the number on the rolls at the end of the summer term; all schools were closed in the following September owing to the outbreak of war.

Since the publication by J. R. Busvine and P. A. Buxton (*B.M.J.*, 1942, 1, 464) of their use of lethane oil as a means of controlling head lice, I have employed it at the scabies clinic with excellent results so far as the killing of lice is concerned, but it leaves much to be desired regarding its effect on nits cemented to the hair. It is unfortunate that scabies seldom if ever, affects the scalp, except perhaps at the nape of the neck, otherwise it would not have been left to me to draw attention to the clinical finding that an emulsion of benzy benzoate is the treatment *par excellence* for pediculosis capitis even when complicated by impetigo, etc. Its solvent action on the cement of the nit and its lethal action on the louse make it a very quick and effective remedy in "delousing."

One must emphasize that it is necessary to use a non-irritating formula of benzyl benzoate emulsion, as the majority

of the emulsions tried first at the clinic were too painful for the patient. However, the latest formula of ascabiol can safely be used twice daily for three or four days, though I have seldom found it necessary to treat for more than three days. This is a most important matter, as unsuitable emulsifying agents in the benzyl benzoate preparation will soon cause sore scalps and poor results. The action on the nit is a "combined operation," because, used alone, neither benzyl benzoate nor the emulsifying agent gives the desired result nor does their use as separate solutions applied one after the other on the same or different days.

#### Method

All the experiments carried out were designed to remove the nits from the hair without the usual tedious work of combing. At first hairs were removed and put into sealed tubes to act as a control for the viability of the nit. This practice was discontinued when it was realized that the object of the experiment was not to determine whether the nit was dead or alive but to discover an easy method of freeing the scalp from nits about whose viability one could never be sure. The results were briefly as follows, after applying the four undermentioned solutions:

Solutions used	Effect on Nits attached to Hairs 24 Hours Later
1. 25% benzyl benzoate dissolved in industrial spirit	Nits still remain adherent to hairs
2. Emulsifying agent (trichloroamine stearate)	No apparent effect on nits
3. Ascabiol (new formula)	Nits loosened, removed by simple wash with soap and water
4. Lethane oil	Nits appear more strongly attached to hairs than before

The effect of ascabiol emulsion is superior to that of lethane oil, as the lice appear to be dissolved in the solution.

The severe cases of infestation with *Pediculus capitis* in which coecal infection had occurred with much crusting of scalp and enlargement of the post-cervical glands were treated daily with the ascabiol. Most of the scalps were clean and healed in less than a week. I do not know of any other form of treatment which gives such quick results, despite the trial in hospital of numerous preparations over a period of many years, with both in-patients and out-patients.

For those wishing to carry out this method of treatment—which is now my routine for all scalps infested with (1) nits only, (2) lice and nits, (3) lice, nits, impetigo, etc.—I have given the technique used at the scabies clinic, where these experiments were carried out by myself and the nursing staff. This method has relieved the staff from the tedium of fine combing: simple washing with soap and water was sufficient to remove all remaining nits.

#### Routine Treatment now used

First day: Head coated with ascabiol (new formula); application made with painter's brush  $1\frac{1}{2}$  in. or 2 in. wide.

Second day: Hair washed with soap and water.

One week later: Head inspected carefully for possible reinfection.

If the infestation is a very heavy one this treatment is given twice in 24 hours. If there is coincident coecal infection of the scalp the treatment is repeated on the second and third successive days; then one of the common forms of healing ointment is given until the inspection of the scalp one week later. Ointments in use are mostly preparations of sulphonamides in Mumford's base, lanette wax, or vaseline. In cases of seborrhoea, sulphur and salicylate in vaseline are sufficient. As already mentioned, treatment with ointments is seldom necessary.

I wish to thank the medical officer of health, Dr. D. Morley Mathieson, for permission to carry out this work at the scabies clinic; also the nursing staff, whose assistance made the work possible. Messrs. May and Baker kindly supplied the benzyl benzoate emulsion "ascabiol" (new formula) used in these experiments.

L. E. McCrea (*J. Urol.*, 1942, 47, 818), who records an illustrative case, states that congenital absence of the penis is one of the rarest anomalies on record, only ten previous cases having been reported. It must not be confused with pseudo-hermaphroditism, hidden penis, or epispadias. The present case was that of an otherwise normal young man who wished to marry. During sexual excitement the presence of erectile tissue in a small eminence on the perineum was manifested by some enlargement, and on manipulation an apparent ejaculation of semen took place.

## Medical Memoranda

### Recovery from Actinomycosis of the Liver

I can find no other report of recovery from actinomycosis of the liver, and therefore consider that this case should be put on record.

In Oct., 1928, a hitherto healthy young man began to complain of abdominal discomfort and anorexia. He wasted very rapidly and by the end of the year was extremely ill. His conjunctivae turned yellow, and on examination a large epigastric mass was discovered. In Feb., 1929, he was operated on at Swansea and a portion of the tumour was removed for microscopical examination. After the operation the surgeon informed the patient's wife that there was a "tumour of the liver" as big as my two fists; that he thought it was malignant; and that he was afraid her husband had but a short time to live. Two months later the tumour had completely disappeared and the patient seemed perfectly well. Now, 15 years later, at the age of 46, he has just been passed for insurance purposes as a first-class life.

The report on the section was "actinomycosis of the liver." Because of an article of mine which was published in the *BMJ* of Feb. 23, 1939 (p. 347), the patient was treated with 5-minim doses of triiodine iodide 3 times a day in milk, and in April of that year he was sent by Dr. Taylor of Swansea to see me for my opinion as to whether the treatment should be continued longer. As a precautionary measure I advised him to take one dose daily for a further 6 weeks.

Bristol.

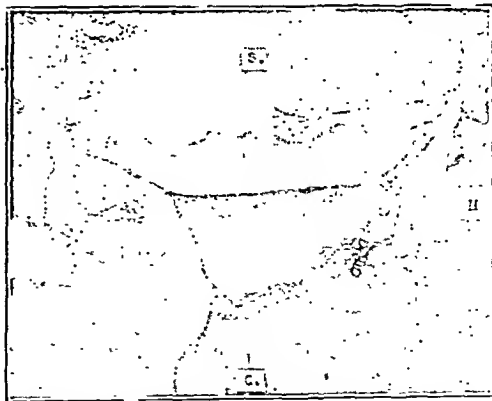
HUBERT CHITTY M.S., F.R.C.S.

### A Case of Congenital Microcolon

Cases of microcolon in the literature stress the extreme rarity of the condition. Theremin (1877) recorded two cases in 111,451 necropsies in Vienna. Greig (1925) reviewed the literature of the condition and published three cases in which the entire colon was diminutive, and in which there were, in addition, abnormalities in the small gut. The case here recorded is one in which only part of the colon was affected, and is comparable to two cases reported by Klippel and Feil (1912) and Lesné and Baruk (1923).

#### CASE HISTORY

The patient was a male first-born infant of 5½ months. Both parents were young and healthy. At the age of 6 weeks the child had a mild skin eruption, which was followed by an attack of acute gastro-enteritis; these responded to treatment. A month later the patient developed acute bronchitis and enteritis, and again recovered. The final illness began with a recurrence of the bronchitis, which progressed to bronchopneumonia with a left-sided empyema. During this last illness the abdomen showed gradual and progressive dis-



Photograph showing transverse colon rolled downwards to reveal the transition in size taking place proximal to the splenic flexure. S, Stomach, with omentum removed. C, Transverse colon. M, Microcolon.

tension, which was associated with severe constipation. Repeated enemata produced small results in which the faeces were normal in appearance. Rectal examination disclosed no abnormality. A straight radiograph of the abdomen showed gas distension of the small intestine and the caecum.

#### POST-MORTEM EXAMINATION

A left-sided empyema was present in association with a small superficial lung abscess; this condition was regarded as the cause of death. The condition of the bowel was of particular interest. The gut was normal in position and fixation. The small intestine was distended, and the distension was more pronounced as the gut was traced distally. The large intestine was distended up to a point

about 1½ inches proximal to the splenic flexure, where the size of the colon became diminutive. The entire descending and pelvic colons were very small. The lumen of the affected segment of gut was quite patent, but was reduced in diameter. There was no evidence of any form of organic obstruction at the junction of the normal colon and microcolon or elsewhere.

It is a feature of particular interest that the segment of colon involved was that deriving its blood supply from the inferior mesenteric artery and corresponding embryologically to the hind-gut.

K. C. McKEOWN, M.Ch., F.R.C.S.Ed.  
C. A. HOLMAN, M.B., B.S.

## REFERENCES

- Greig, D. M. (1925). *Edinb. med. J.*, 32, 175.  
Klippel, M., and Feil, A. (1912). *Bull. Mém. Soc. Anat. Paris*, 6<sup>e</sup> s., 14, 144.  
Lesné, E., and Baruk, H. (1923). *Presse méd.*, 31, 1034.  
Theremin, E. (1877). *Dtsch. Z. Chir.*, 8, 34.

## Traumatic Rupture of the Superior Vena Cava

The following case is considered unusual enough to justify description of the post-mortem findings in some detail. It is that of a West African soldier, of limited horsemanship, who was riding his officer's polo-pony at a gallop when the pony swerved to one side and the rider struck his chin against a metal pylon. The force threw him from the pony. The man was seen to give a few gasps, and died within two minutes.

## FINDINGS AT NECROPSY

**External Appearances.**—The body of a well-developed African male about 25 years of age, with the head lolling abnormally. Severe bruising and abrasions were seen on the forehead, chin, and left hip, and a few scratches on the front of the left thigh. The nose was battered in, and the mouth contained much road-grit. There was no haemorrhage from either auditory meatus.

**Internal Appearances.**—**Skeletal system:**—The cervical spine had fracture-dislocations of C3 and C5, the fractures involving the articular pillars with posterior displacement of the neural arch. The bodies of the vertebrae were intact. **Heart and Mediastinum:**—The pericardium was under tension due to contained blood, and several large bubbles of air were found. About half a pint of liquid blood was present in the pericardial sac. The heart was covered with a slight excess of pericardial fat, and the right ventricle was considerably dilated but empty. There were a few small subendocardial haemorrhages in the left ventricle. All four valves were normal. The coronary arteries were free from atheroma, but small bubbles were visible within their lumina and could be expressed, especially from the anterior descending branch of the left coronary artery. The aorta was normal. The superior vena cava was completely ruptured across just within the pericardial sac, about three-quarters of an inch from its entry into the right auricle. The distal end of the vein was separated from the proximal end by some two inches, the intervening space being filled with blood-clot. The escaped blood had extravasated around the base of the aorta, downwards behind the heart, and upwards as far as the thyroid, to form an irregularly trilobate mass (see Fig.).

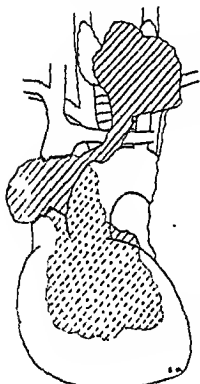


Figure showing extent of extravasation. The interrupted shading represents clot behind the haemopericardium.

**Lungs:**—The right pleural cavity was partially obliterated by old dense fibrous adhesions. The left pleural cavity was normal, but an irregular-shaped haemorrhage, about 1 in. by 2 in., was present under the parietal pleura underlying the fourth and fifth ribs in the mid-axillary line. There was no fracture of the ribs in this region or elsewhere. The visceral pleurae were both intact. At the antero-superior margin of the left lung a large emphysematous bulla was present, filled with blood and air. Many small bubbles were visible under the pleura on both the mediastinal and the costal surfaces. The lungs were bulky, firm, dark, and erepitate. The lower part of the trachea and the main bronchi were filled with frothy blood. On cutting across the lungs they were seen to be turgid with contained blood.

The only other finding of note was that the left ureter was thickened and congested, and there was a cylindrical swelling 1 in. long situated about 3 in. from the kidney pelvis. This was due to schistosomiasis, a condition not uncommon in the West African. The bladder was normal.

## COMMENT

From the injuries to the nose, forehead, and chin, the grit in the mouth, and the double fracture-dislocation of the cervical spine, it is thought likely that a severe degree of hyper-extension of the latter occurred. Presumably this caused considerable tension on the superior mediastinal contents, resulting in rupture of the superior vena cava. Death could not have been instantaneous, as evidenced by the subendocardial haemorrhage, the air bubbles in the coronary arteries, and the blood-distended lungs showing interstitial emphysema.

I am indebted to Brig. R. A. Hepple, D.D.M.S., West African Forces, for permission to publish this case.

S. ORAM, M.D., M.R.C.P.,  
Capt., R.A.M.C.; Graded Physician.

## Reviews

### SKIN GRAFTING OF BURNS

*Skin Grafting of Burns.* By J. Barrett Brown, M.D., senior consultant in plastic surgery, E.T.O., U.S. Army; associate professor in surgery, Washington University; and Frank McDowell, M.D., assistant in clinical surgery, Washington University. (Pp. 204; illustrated, 30s.) London: J. B. Lippincott Company.

This is an excellent concise statement of the value of skin grafting in the treatment of burns. The authors have drawn from their experience during many years, to which are added observations by one of them (Dr. Barrett Brown) in this country since the war started.

The book is essentially practical, and therefore no attempt is made to sift or discuss the great mass of theoretical and controversial matter that has filled the medical press in recent years. The authors describe the methods they have found most useful and the reasons for their choice. Early treatment comprises adequate cleansing, open surgical drainage (including baths), and pressure dressings. The disadvantages and danger of coagulants are discussed. Careful histological studies of healing burns, of unhealed ulcers of donor sites, and of healed grafts are included to explain epithelial repair. Split-skin grafts applied early are recommended in all deep burns to obtain primary healing. The exact technique is described, and photographs of grafts as much as 36 in. long are reproduced. The many methods used in late repair are next described. The authors appear to have had most success with split-skin grafts and many excellent results are illustrated. Flaps and tubed pedicles are also used, but these are not described in great detail. There is an interesting chapter on the use and limitations of homografts, and another on the faults of grafts.

This is a book that all should read, if only to learn from the many excellent illustrations the best methods for quick restoration of function in these so often tragic cases.

### THE TOO-PROTECTIVE MOTHER

*Maternal Overprotection.* By David M. Levy, M.D. (Pp. 417, \$4.50 or 30s.) New York: Columbia University Press; London: Oxford University Press, 1943.

This book is the product of collaboration by the staff and students at the Institute of Child Guidance of New York. The importance of mother-child relationship in the study of psychiatry is pointed out, and the "broad front" approach of child guidance team-work is contrasted with the "narrow front" approach of psycho-analysis. Both may be useful. From the large volume of child guidance material a number of cases of "obvious" over-protection were selected, and these could be contrasted with other groups investigated by different groups of workers. Five groups of over-protection could be differentiated, but only the first can be considered as "pure." They are: (i) over-protection of a wanted child; (ii) predominance of but inconsistency of over-protection which is mixed with rejection; (iii) over-protection in infancy followed by rejection on the arrival of a second child; (iv) mild maternal over-protection; (v) non-maternal over-protection.

The criteria of maternal over-protection are taken as (a) excessive contact; (b) prolongation of infantile care; (c) prevention of independent behaviour; (d) maternal control. This last criterion may be modified when the mother is "conquered" by the child and becomes submissive to it at home while maintaining her protective attitude towards it in face of the outside world. Excessive contact is characteristic especially in relation to boys sleeping with their mothers, but incestuous fantasies or activities were not found to be prevalent. Prolongation of infantile care is examined statistically in relation to breast-feeding, which is shown to be prolonged in over-protected children. Prevention of independent behaviour is dealt with in relation to school performance. The over-protected child tends to show superior educational achievement, relatively high scores in language, poor score in arithmetic (because mothers are not good at arithmetic and because the child is not sent on messages which need arithmetical calculations?), and special interest in reading with a general lack of interest in sports. Other effects of this kind of over-protection are discouragement from forming friendships.



and playing with other children, and the reputation of being "sissy" outside the home, although such a child may be very tyrannical in the home.

It was found that many too-protective mothers were over-anxious for children because of long periods of sterility and the like. There is no conclusive evidence that this over-apprehensiveness was compensatory for an unconscious hostility to pregnancy. Sexual maladjustment with the husband was common, as was the factor that the couple had little in common in their social life. Many of the over-protecting mothers had been themselves deprived of satisfactory parental relationships. The mothers who were the subject of this study tended to be aggressive and their husbands to be submissive. There was a distinct tendency in the family histories for grandparental interference.

The behaviour of over-protected children is characterized by disobedience, impudence, tantrums, excessive demands, and varying degrees of tyrannical behaviour. At school they behaved fairly well—perhaps because they were intelligent and their mothers ambitious. In the case of three boys who were troublesome in school both mother and child were of poor intelligence. These children found difficulties in making friends, though camps made this better. No particular sexual disturbances were found. They suffered from feeding difficulties, not from sleep or secretory troubles. They were well developed physically, and in general well looked after.

Methods of treatment, in addition to remedying physical defect, consisted in psychotherapy of the mother, to get her to realize what she was doing and release the child; of the father, to persuade him to take more interest in and exert more authority over the child; of the child, to show him why he was dependent and tyrannical and to induce him to take a more responsible attitude to life. Environmental therapy consisted in attempts to widen the interests of the mother and to bring her into closer social relationship with her husband, so that the parents could be husband and wife as well as father and mother. The child was provided at least with opportunities for contacts and activities outside the home. The social worker attempted to give practical demonstrations in the home of how the situation should be handled. The main thing was to separate mother and child by some means or other, if necessary by periods of absence from each other. On the whole, treatment showed satisfactory results, but as a rule was difficult and took up much time. A final chapter is devoted to a description of case studies and follow-up; and, in an appendix, detailed summaries are given of twenty cases.

This book is a masterly exposition of a collective research into a limited but important field of personality relationship, which has no small influence on the development of the adult personality, and it can be recommended to all who are attracted by child psychiatry as an interesting study and a valuable book of reference.

### NARCO-ANALYSIS

*Narco-Analysis. A New Technique in Short-cut Psychotherapy. A Comparison with Other Methods; and Notes on the Barbiturates.* By J. Stephen Horsley. Oxford Medical Publications. (Pp 134. 8s. 6d.) London: Oxford University Press, 1943.

This small book covers the various aspects of the treatment of psychiatric conditions by means of the injection of an atrovane barbiturate to produce a degree of narcosis in which the patient is more communicative than in ordinary circumstances. The technique and its various applications are described.

The special interest of the book lies in its description of the few cases of the melancholic or, more rarely, of the schizophrenic type in which the method has enabled psychotherapy to be applied successfully, though unfortunately the case records are hardly full enough to be satisfactory. Incidentally the claim is implied by the author that he was the first person to use this method in this country. This, indeed, is probably true so far as any "analysis" is concerned, but he was not in a position to know that the first person to use it as a method of treatment in psychogenic disorders in this country was Dr. Broome of Oldham, who employed it with success in hospital practice as a means of conveying therapeutic suggestions in a wide variety of psychiatric conditions.

Dr. Broome has, however, forborne to publish his results from an excess of modesty.

This book is a convenient if enthusiastic summary of the field of application of the method, and it is to be hoped that those who have not tried it out may be stimulated to use it in the carefully selected field where it is useful chiefly as a time-saving device. When the exigencies of wartime make it a tempting short-cut, it can easily be abused.

### Notes on Books

In these days of crowded life, when the fashion is to concentrate everything from vitamins to air assaults, there may be a growing band of embryo surgeons who relish the idea of concentrated textbooks. The day may come when the operator has before him in the theatre a sterile guide to surgical technique even as the conductor has his score of music. The majority still believe that operative surgery is an art which cannot be so practised, neither can it be learned from summaries pinned to the bedroom wall. For those to whom the concise presentation of facts in tabulated form does appeal Dr. MORRIS A. GOLDBERGER's little book *Gynecologic Surgery* will have a special fascination. It contains an amazing amount of information in its 154 pages of summarized text. It is entirely devoid of diagrams, but every third leaf is left blank for the convenience of the reader who wishes to add his own notes or sketches. The subject is covered in 14 sections, which for the most part are arranged on an anatomical basis. An adequate index concludes the little book, which is published in this country at 12s. 6d. by the Oxford University Press.

Dr. J. NEWTON KUGELMASS has written *Clinical Pediatrics* as a member of the outline series published at 12s. 6d. by the Oxford University Press. It is entirely in the form of a synopsis, with headings and subheadings to facilitate easy consultation. As a work of reference it will enable the reader to get a quick view of symptoms and treatment, but it builds up no clinical picture and it gives little indication of the relative importance of different subjects. The seventeen sections range from "growth and development" to "infectious diseases." "Blood disorders" are described in 62 pages and "respiratory disorders" in 15. This gives some indication of the lack of balance, possibly due to the method of classification used, for both asthma and tuberculosis appear outside the respiratory section. In view of the nature of the book the index might have been more extensive. There are no illustrations.

*An Introduction to Group Therapy.* by S. R. SLAVSON, printed in New York under the auspices of the Commonwealth Fund, is published here by the Oxford University Press at 11s. 6d. There are two justifications for group therapy—first as a time-saving device, and secondly because many psychiatric disorders are concerned with failure to adapt to the demands of society so that treatment in the company of others under controlled conditions may have special possibilities of its own. This book, which is systematically written and well documented, describes the indications for group therapy and its technique, and discusses the interpretation of what actually happens in the therapeutic process. Those who are themselves concerned with the treatment of children will be particularly interested in the opinions of the author as to the types of character and personality suitable for group therapy. A merit of the work, which can be warmly recommended to workers in child guidance in this country, is that it is based on much observation and is not biased by theoretical preconceptions. The group therapy of adults is given only a page or two in connexion with the treatment of mothers, originally in relation to their children's problems.

The Department of Scientific and Industrial Research has issued through H.M. Stationery Office at 4s. 6d. No. 3 of volume 14 (Dec., 1942) of the *Index to the Literature of Food Investigation* compiled by Agnes Elisabeth Glennie, B.Sc., and Catherine Alexander, B.Sc. These brief abstracts are, as usual, listed in sections, followed by an index of authors. The items in the present number run from 933 to 1455 inclusive.

A second edition of *The Nupercaine Handbook*, originally known as *The Percaine Handbook*, has been published by Messrs. Ciba. They are to be congratulated on having collected a voluminous literature on the use of nupercaine and reduced it to a concise but very readable form. The publication is in two parts, the first dealing with spinal and the second with local anaesthesia. Both surgeons and anaesthetists will find much of interest in these booklets, while those who use nupercaine will find them invaluable. A very complete list of references is given at the end of each part. Copies may be had on request from Ciba Limited, Horsham, Sussex.

*Correction.*—The reviewer of *Blood Grouping Technic*, by Schiff and Boyd (Jan. 1, p. 13), wishes to correct a small slip in his notice. The sentence "Actually the proportion of A<sub>2</sub> is the same in A and AB—about one . . ." should read "Actually the proportion of A<sub>2</sub> is nearly the same in A and AB—about one . . ."



## BRITISH MEDICAL JOURNAL

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## EPIDEMIOLOGY OF SCARLET FEVER

The greater prevalence of scarlet fever last autumn has led to some quickening of interest in an infection which the younger generation of medical men regard as among the milder of childhood fevers. Those whose memories go beyond the turn of the century, however, learned to have a wholesome respect for scarlet fever, and, despite an 85% reduction in fatality during the past 50 years, they still wonder if the virulent form of the infection will return. The occurrence of rather serious outbreaks of scarlet fever in certain parts of Rumania from 1934 to 1938 led to a fear that the severity of the disease was, in fact, on the upgrade, and encouraged the International Health Division of the Rockefeller Foundation to send an American team of workers to study its epidemiology in that country. The studies were centred round the town of Jassy, and the populations of four villages 3 to 34 miles distant from the town were chosen for intensive investigation. A public health nurse was resident in each village and visited every household over a month, while a medical member of the team visited the village at least twice a week. Once a month about 10% of the village population had their throats swabbed; a Dick test was done on all available inhabitants once a year, and blood for anti-streptolysin tests was taken from all contacts and patients with streptococcal infection. Haemolytic streptococci isolated from throat swabs were tested for Lancefield group, and, if Group A, were further examined for Griffith type. During the 3½ years of the study, interrupted by the war, scarlet fever broke out in only one of the four villages. The observations on this outbreak linked with the great mass of interesting data from the four centres have shed fresh light on the epidemiology of streptococcal infection in general and scarlet fever in particular.<sup>1</sup>

The occurrence of scarlet fever in epidemic form is determined by a variety of factors—e.g., environmental conditions, the nature and prevalence of the infecting organism, and the distribution and resistance of the host-population. Some of the components are measurable; others are not. Of environmental factors, climate and season are both important, for the disease is unknown in the Tropics, and its incidence has a rough relation to the latitude of a country; though why the tropical peoples should be unhappy breeding-grounds for the streptococcus is still unknown. Seasonally, scarlet fever is a disease of late autumn or early winter, rising steeply in September and October to reach its peak in November or December. This seasonal increase has no relation to the occurrence of respiratory catarrhal infections, but seems to be closely linked with the reassembly of schools. Preceding the

seasonal wave of clinical infection goes a corresponding rise in the streptococcal carrier rate, as Straker and his colleagues<sup>2</sup> noted for London, and as the American workers have confirmed in Rumania. This antecedent carrier wave has been noted in other epidemic infections such as cerebrospinal fever and lobar pneumonia, and where there is a large variety of serological types of the infecting organism (as with the pneumococcus and streptococcus) it affects particularly the epidemic strain. Griffith<sup>3</sup> noted this same fact of a particular strain of haemolytic streptococcus suddenly assuming epidemic propensities in a boarding school, but so far no explanation has been given for the phenomenon. An increased carrier rate of the epidemic strain is not always followed by an outbreak of clinical infection. Other points about streptococcal carriers that emerge from the Rumanian studies are that those under 20 years of age are more likely to be carriers than older people, and that, although Dick-positive and Dick-negative children are equally likely to be carriers, Dick-positive adults are about 50% more likely to harbour the streptococcus than are Dick-negative adults. This last point may give some encouragement to the immunization of nursing staff against scarlet fever.

No one would now deny that the haemolytic streptococcus is causally related to scarlet fever, but that there is no special scarlatinal streptococcus perhaps still needs to be emphasized. The American workers collected scarlatinal strains from many countries and found a great variety of serological types among them, with, as a rule, one or two predominant in each country. Thus, Type 1 was most common in Denmark, Hungary, Italy, Portugal, Turkey, China, and Scotland; Type 2 in Norway; Type 3 in Germany; Type 6 in Finland; Type 10 in Rumania, Bulgaria, and Greece; and Type 17 in Latvia and Australia. The types of streptococcus causing scarlet fever are also commonly found in other streptococcal infections, though these are disease-producing streptococci which are incapable of causing scarlet fever. Both scarlatinal and non-scarlatinal types are also found among symptomless carriers, and the number of cases of scarlet fever with which a particular strain of haemolytic streptococcus is associated will depend on the degree of dispersal of that strain throughout the community.

Turning to the host, the American observers believe that susceptibility to scarlet fever depends on two factors—an antibacterial and an antitoxic resistance. The Dick test, which measures immunity to the erythrogenic toxin of the streptococcus, is ordinarily regarded as the test of susceptibility to scarlet fever, and it is true that infection rarely occurs in Dick-negative persons. But in Rumania 44% of Dick-positive persons who became infected with the epidemic scarlatinal strain failed to develop any clinical illness, and the authors postulate an antibacterial immunity which presumably protected the individuals against a local throat invasion by the streptococcus. Instances of medical and nursing staff developing scarlet fever after 10 years or more intimate contact with the disease spring to mind. Evidence of infection with the streptococcus as shown by a rise in antistreptolysin titre occurred not only in

<sup>1</sup> Schwentker, F. F., Janney, J. H., and Gordon, J. E., *Amer. J. Hyg.* 1943, 38, 27.

<sup>2</sup> Straker, E. A., Hill, A. B., and Lovell, R., *Rep. Ministry Hlth.*, London, 1939, No. 90.

<sup>3</sup> Epidemics in Schools, *Spec. Rep. Ser. M.R.C.* No. 227, London, 1938.

clinically infected persons but also in apparently symptomless carriers, and even in those from whom no streptococcus was isolated. Failure to recover the streptococcus by throat-swab culture does not, of course, preclude its presence, as it may be deep in the tonsillar crypts.

Summing up, and keeping in mind the many variables, we may suppose that the result for the host of contact with scarlatinal streptococcus will depend on whether he does or does not possess antibacterial and antitoxic immunity. If he has antibacterial immunity he may either throw off the streptococcus or become a symptomless carrier; if he has antitoxic but no antibacterial immunity he gets tonsillitis; if he has neither he develops scarlet fever.

## INFANT MORTALITY IN SCOTLAND

The infant death rate in Scotland is greater than in England and Wales, any British Dominion, or the U.S.A., and higher than in the majority of the countries in Western Europe. This adverse position is due to the slower improvement that has been effected in the rate for Scotland than in other countries. The decrease in infant mortality began in several countries some years before the rate started to decline in Great Britain. Since 1896-1900, when the infant mortality in Scotland was 130 and that of England and Wales 156, there has been a steady decline, and in 1936-40 the rates had fallen to 76 and 55 respectively. A much greater improvement during this period was shown by Holland, where the rate fell from 151 to 37. An inquiry into the possible factors which determined the high level of Scotland's infant mortality has been instituted by the Department of Health for Scotland.<sup>1</sup> The report has four main sections: the mortality of live-born infants, stillbirths, the feeding of mothers and infants, the medical services.

When a comparison is made with England and Wales a large part of the excess mortality in Scotland is found to be contributed by infants aged 1-12 months. The death rate under 1 month (neonatal mortality rate) during 1936-40 was 37 in Scotland and 29 in England and Wales, and for 1-12 months it was 39 and 26. The rates for both countries were very high when compared with New Zealand and Australia, where the rates were 23 and 27 for under 1 month and only 10 and 12 for 1-12 months. The infant mortality rate for geographical divisions varies considerably. The highest rate in Great Britain during the quinquennium 1934-8 was that for West Central Scotland with a figure of 88, while fairly low values were found in the Highlands and Islands. The difference between the mortality of cities and rural districts in Scotland, 86/65, was larger than in England and Wales, 65/50. The experience of Scotland is dominated by that of the city of Glasgow, where over a quarter of the total births of the country are registered. This city has the largest infant mortality of all the cities of Great Britain: during 1934-8 it was 99; the second largest rate was Sunderland, 80. Edinburgh, with a rate of 66, compared favourably with cities in England and Wales. During the first month of life the chief causes of death are prematurity, congenital debility, malforma-

tions, and injuries at birth, while during the succeeding months half of the deaths are due to infections. The high infant mortality in Scotland is largely due to a smaller reduction under this heading than has been effected in other countries. Among the factors associated with a high infant mortality the report considers climate, economic and environmental conditions, birth rate, and illegitimacy. The severe winter of the industrial central area may have an adverse effect on child life, but in general there is no evidence that there is an association between infant mortality and climate. Norway and Sweden have mortalities considerably below that of Scotland. There appears to be some relation between mortality at ages 1-12 months and overcrowding and unemployment when the twenty-four large burghs of Scotland are considered, but the association is not large. Glasgow had the highest rate, but nine of the other burghs had a bigger overcrowding index, and five had a greater proportion of the insured population unemployed. Dumfries, with a very low overcrowding and unemployed index, had the third largest rate. In England and Wales there is an inverse relation between infant mortality and social class; though data are not available, this is probably true for Scotland. No large-scale inquiry has been held, but the available evidence shows that infant mortality is correlated with the birth rate. A high birth rate is associated with very early and very late child-bearing and rapidity of breeding—factors that have been shown to have an adverse effect on the chance of surviving the first year of life. Babies are generally infected by their elder brethren of school age, and the later ranks of births have a higher mortality from infectious diseases than the first. A minor factor in determining infant mortality is the size of the illegitimate birth rate. The illegitimate mortality is considerably higher than the legitimate: in 1940 the rates were 120 and 76 in Scotland and 82 and 55 in England and Wales. The percentage of illegitimate births was 6 in Scotland and 4 in England and Wales.

Stillbirths have been registered in Scotland only since 1939, and so far as comparisons can be made there is an excess similar in proportion to that found for mortality during the first month of life. The stillbirth rate tends to be high in the areas where infant mortality is high, but the correlation is probably not large. In the four cities Glasgow, Edinburgh, Dundee, and Aberdeen, during 1939-42 the infant mortality was 95, 64, 77, 74, and the stillbirth rate was 44, 39, 46, 36. No national statistics are yet available for stillbirths by occupation or social class, but small-scale investigations have indicated that possibly the working class have a higher rate than the highest income groups. The returns for England and Wales show that the stillbirth rates are greatest among the first births for all ages of mother, and the rates increase with age of mother and parity after the second birth. The cause of death was unknown or ill defined in one-third of the Scottish stillbirths, but 40% of the total stillbirths could be attributed to hazards of birth and 60% to abnormalities pre-existing in the mothers. During 1938-42 the stillbirth rate in Aberdeen hospitals was 30 per 1,000 births; only 20% were due to hazards of birth, while 80% were due to pre-existing conditions. This small-scale observa-

<sup>1</sup> *Infant Mortality in Scotland*. H.M. Stationery Office. (Is. 3d.)

tion suggests that better ante-natal care would lower the general rate.

The effects of feeding of mothers and infants have to be inferred from rather small investigations, but in the larger investigations covering the general population there is evidence that the adequacy of diets is correlated with economic status. The report suggests that the proportion of inadequately fed mothers in Scotland is high, and because of this there is an excess of unsatisfactory lactations of short duration. The artificial feeding of infants is not satisfactory, from either the hygienic or nutritional standard. Scotland has lagged behind in the provision of maternity and child welfare services. The ratios of ante-natal clinics to births and child welfare clinics to births were in 1937, 1 to 481 and 1 to 336 in Scotland, and the corresponding ratios in England and Wales were 1 to 370 and 1 to 182. The incidence of infections in Scottish maternity hospitals is high. These hospitals are overcrowded, especially the voluntary hospitals, due to a tendency for a larger proportion of mothers to have their confinement in an institution. Among the conclusions reached in the report are that a substantial reduction in the infant mortality of Scotland can be achieved by improving the social and environmental conditions; by enlarging and improving the child welfare services, including the instruction of mothers in infant feeding and hygiene, and the urging of the importance of breast-feeding; more maternity hospitals, and a bigger place in the medical curriculum for teaching of child health and nutrition; and post-graduate courses for family doctors in these subjects.

The above cool analysis of the problem sticks to facts and the inferences to be drawn from them. But when we compare the infant death rates of Great Britain with those of Holland, New Zealand, and Australia, and when we set Glasgow's rate of 99 against England's rural rate of 50 and Edinburgh's rate of 66 during the same period, we cannot help feeling that there is something sadly wrong with our present-day society that such depressing disparities are allowed. A hundred years ago Oliver Wendell Holmes had what he called "my battle for the poor poisoned women." The battle must be renewed—and for the "poor poisoned infants."

## THE NEUROTIC CONSTITUTION

The importance of neurosis in the Services is even greater than its considerable numerical incidence would indicate. As distinct from most physical illness, there is the added cost in terms of endangering others and impairing morale. But although in time of war the problem may appear more urgent and the precipitating factors may be more numerous, there can be no doubt that in terms of social inefficiency it is one of the most important problems of peacetime also. The opportunities for systematic study are, however, far greater in wartime, and it is good to know that they are not being wasted. A recent study by Eliot Slater<sup>1</sup> on 2,000 neurotic soldiers presents facts of great interest to the Services; and as in addition he develops with characteristic clarity a well-constructed general hypothesis based on ingenious methods of analysis, his contribution is of the first importance in both war and peace. The sample, all men, consisted of soldiers with a few sailors and airmen who were admitted to an emergency hospital between

November, 1939, and June, 1941. It thus contains a considerable number of psychiatric casualties of the battles of France and Belgium. The sample is not fully representative. Psychotics, mental defectives, epileptics, and delinquents are under-represented, as they would often be dealt with in other ways. For the same reason there is selection in favour of severity. Nevertheless, the material does give a fair picture of quite a large part of the Army problem.

It is a sobering reflection that Slater has this statement to make: "Very large numbers of these men, who were as a rule useless as soldiers from the beginning, might have been kept out of the Army had they been given even the most cursory psychiatric examination." Nor was the outcome encouraging. Nearly three-quarters of the patients had to be invalided. Of those returned to duty half had to be invalided at any time from a few weeks up to a year. Improvements have, of course, been effected, as regards both initial exclusion and disposal, and it is to be hoped that better results are now being attained. In the matter of disposal it is stated that no matter what treatment is employed the results are the same. The hopeful approach, it is claimed, is not psychotherapy—the adjustment of the patient to his environment—but the converse—the adjustment of the environment to the patient.

Only a few points can be mentioned from a paper that should be studied in full by all interested in the subject. Military stress is found to be especially potent in producing anxiety and also hysterical symptoms and amnesia. Many men suffering from anxiety states are of good constitutional type; the breakdown would have been difficult or impossible to predict and the prognosis is relatively good. Even here, however, constitutional make-up is still of major importance, while in some other groups—for example, the obsessionals or the psychopaths—breakdown has little or no relation to stress. It is noted that there are profound differences—highly significant statistically—between the endogenous and the reactive depressions as regards frequency of association with childhood neurosis, previous nervous breakdown, anxious traits, and pyknic habitus. Slater also notes how easily the predisposed individual becomes conditioned to such things as dive-bombing, and remarks that there is plausibility in the view that the plastic mind of the child is even more susceptible. The general hypothesis is summed up thus:

"Neurosis represents a special case of a generalized type of behaviour, and signifies a failure of adaptation. The two primary reagents are the individual constitution and the environmental set-up of the moment. The individual constitution is in greater part determined by hereditary factors, to a lesser degree by environmental circumstances of the past producing their effects by organic lesion and psychological and physiological conditioning. These factors, especially the first, determine the form and the severity of the congeries of symptoms which are the so-called neurotic states or neuroses. The momentary environment determines the time of manifestation, and to a lesser extent the severity and even the form of the symptoms (e.g., the association of military stress and anxiety). Other factors, such as physical illness or physiological upset and intellectual incapacity, can have an adjuvant effect, and may also influence the form of the reaction (e.g., mental defect in favouring hysterical manifestations, physical illness in favouring hypochondriasis). . . . There is little to be said for the convention by which certain traits, such as aggressiveness and asocial tendencies, are regarded as psychopathic, whereas tendencies towards anxiety, instability of mood, dissociation, etc., are regarded as neurotic. If we wish to introduce system and reason into our nomenclature it will be necessary to discover further traits showing the degree of specificity and independence that obsessiveness seems to show. . . ."

This hypothesis is put to the ingenious test of a "factor-analysis" analogous to those tests familiar to the educa-

<sup>1</sup> *J. Neurol. Psychiat.*, 1943, 6, 1.

tional psychologist. Within the limits of the statistical methods employed, and in view of the inevitable errors of observation, the test proves to be highly favourable to the hypothesis. The double assumption of a neurotic constitution and a poor intelligence accounts for more than 90% of the observed variability. If it is true that hitherto intelligence has been considered too exclusively in quantitative terms it would seem to be even more true that far too qualitative a view has in the past been taken of temperamental traits. A recognition of the quantitative aspect of neurotic tendencies may well lead to a clearer understanding and to important advances in knowledge.

### LIPHOPHAGIC GRANULOMATOSIS

Numerous terms have been proposed for a pathological process, usually seen in localized fatty tissues, whereby phagocytosis of fat droplets by giant cells sets up a cellular granulomatous condition in which fibroblasts, leucocytes, and other cells take part. Such granulomata have been described in the breast, subcutaneous tissues, and mesenteric fat depots, and appear to result from some local fat necrosis with liberation of lipolytic ferments and subsequent foreign-body reaction of the neighbouring tissues. Besides such local lesions a rare but apparently identical histological condition is seen now and then in which the changes occur in the inner coats of the small intestine and involve the mesenteric lymph nodes. S. Sailer and R. J. McGann<sup>1</sup> have described such a case and reviewed the literature of this subject without, however, precisely defining either the aetiology or the symptomatology, but adopting the title "lipophagic granulomatosis." In their case post-mortem examination showed massive lipophagic granulomatosis of the abdominal lymph glands, and infiltration of the mucosal villi of the small intestine with large foamy mononuclear cells and giant cells. The colon was unaffected, but most of the small intestine showed these changes, which spread into the muscularis mucosae and were associated with much general cellular infiltration. Stained with scarlet red and osmic acid, these large cells gave the reactions for neutral fat, as did cells in the adjoining lymph nodes. Clinically the patient was observed for a period of two years, during which time he suffered from abdominal pain, weakness, loss of weight, and anorexia. The abdominal pains were worse after eating but were almost constant during the day. There was no steatorrhoea. A moderately severe hypochromic anaemia developed which did not respond to treatment, including blood transfusion. A terminal peritoneal effusion occurred and an acute bronchopneumonia. Some other cases in the literature have shown a polyarthritis. Of the various explanations put forward to account for these remarkable pathological changes none is wholly satisfactory. Lymphatic obstruction causing stasis and backflow of chyle in the intestinal lacteals seems to be ruled out. Whipple<sup>2</sup> suggested that the fat absorbed in the intestine became in some way abnormal or possessed some toxic property, in view of the process being limited to the structure concerned with fat absorption, while lymphatic tissues elsewhere were practically normal. Others have postulated some disturbance of pancreatic lipase secretion whereby the intestinal fat is abnormally split and the absorbed abnormal products provoke a foreign-body response in the intestinal mucosa. Whatever may ultimately prove to be the explanation, accounts of such unusual and striking changes deserve careful study, because it is often through such apparent errors in metabolism that light is thrown upon normal processes.

### TUBERCLE BACILLI IN MILK

One of the proposals in the Government's White Paper on milk policy, discussed in our issue of Aug. 7, 1943, is to define scheduled areas within which no milk shall be sold unless it is adequately heat-treated, tuberculin-tested, or "accredited" coming from a single herd. The wisdom of this last exception has been questioned in a number of quarters. Figures recently collected by Sir William Savage show that the proportion of samples of "accredited" milk found to contain tubercle bacilli was almost consistently higher than that of ungraded raw milk. The danger of allowing "accredited" milk to be sold raw is aggravated by the present state of the law, which makes no provision for the stoppage of the infected milk supply. Under the Tuberculosis Order a cow suffering from a tuberculous udder must be condemned, but mixed milk shown by bacteriological examination to contain tubercle bacilli may continue to be sold. What happens in practice when tubercle bacilli have been demonstrated in the milk of a given herd is that the local medical officer of health informs the county medical officer, who, in his turn, passes the information on to the divisional veterinary inspector of the Ministry of Agriculture. Nothing more is then heard by the health authorities until a notice is received, usually two or three months later, that the tuberculous cow has or has not been found and that the milk is now free from tubercle bacilli. This mechanism is cumbersome, laborious, and time-consuming, and fails to protect the public in the meantime from the risk of drinking tuberculous milk. In his report for the years 1939 to 1941 Dr. G. G. Wray, M.O.H., Fulwood Urban District, suggests the following alternative procedure: (1) Compulsory notification, under heavy penalty for non-compliance, of tuberculosis in cattle; (2) provision of free veterinary inspection immediately on notification; (3) prohibition of the sale of milk from the farmer till after adequate heat treatment, the producer to be guaranteed against any monetary loss on the sale of this milk; (4) payment to the producer of a fee for notification, and of compensation equal to the full market value of the cow after the animal is slaughtered; (5) authorization for the local authority to provide a heat-treatment plant itself or to license a local commercial plant for this purpose; (6) responsibility for the efficient discharge of the whole scheme to be placed on the local authority. It is believed that this alteration in procedure, by placing the responsibility for action on one authority instead of three, would obviate the defects of the present system.

Attractive as this scheme may appear at first sight, it is doubtful whether it would work out satisfactorily in practice. In the first place, very few farmers could be expected to diagnose udder tuberculosis themselves. Even after tubercle bacilli have been demonstrated in the mixed milk of a herd a skilled veterinarian may have great difficulty in finding the infected cow, and often has to have further bacteriological examinations carried out before his search is successful. Secondly, how is free veterinary inspection to be provided by a small local authority? Is the authority to call in a private veterinarian, or is it to command the services of the Divisional Veterinary Inspector, who, it will be remembered, is a whole-time servant of the Ministry of Agriculture? Again, would it be economical for a small local authority to install pasteurizing equipment for the milk of a single herd, and who would be qualified to run it? Other difficulties might be raised. Nevertheless, the contention that raw milk known to contain tubercle bacilli should not be allowed to be sold in the liquid market is absolutely sound, and it is to be hoped that in the new Milk Bill such a prohibition will be incorporated.

<sup>1</sup> *Amer. J. Digest. Dis.*, 1942, 9, 55.

<sup>2</sup> *Johns Hopk. Hosp. Bull.*, 1907, 18, 382.

<sup>3</sup> Memorandum of the People's League of Health on "Measures to Improve the Quality of the Nation's Milk Supply," Sept. 24, 1943, London.

## THE LATE DR. G. C. ANDERSON

## MESSAGES OF CONDOLENCE

The British Medical Association has received messages of sympathy on the passing of Dr. Anderson from all parts of the country and from many parts of the world. The Minister of Health in a letter to Lord Dawson, the President, says with what "very real regret I have heard of the death of Dr. Anderson, and I should be grateful if you would convey my personal sympathy to the officers and members of the B.M.A. I have heard much of the wise and courageous advice with which for so many years he helped my predecessors. . . I fear we have lost a man whose services at this time could be invaluable."

The following message has been received from the Registrar of the Royal College of Physicians of London: "The Council of the Royal College of Physicians desires to convey to the British Medical Association its sense of the great loss sustained not only by the Association but by the whole profession of medicine in the death of Dr. G. C. Anderson, whom the College was happy to count among its Fellows. His wide knowledge of the conditions of medical service, his statesmanlike qualities, and his great gifts as a negotiator will be sorely missed, and the Council wishes to place on record an expression of its sense of the irreparable loss which the profession has sustained, and its sympathy with the British Medical Association in the loss of so able and so devoted a Secretary."

Tributes have come from the Federal Council of the Association in Australia, the Canadian Medical Association, the New South Wales Branch, South Australian Branch, and Victorian Branch, and the Jamaica Branch; from many Local Medical War Committees, Divisions and Branches of the Association, and Local Medical and Panel Committees. Messages of sympathy have been received from the Medical Branches of the Service Departments, the Medical Personnel (Priority) Committee, Medical Association of Eire (I.M.A. and B.M.A.), the Medical Women's Federation, Medical Association of South Africa, Editor and Staff, *South African Medical Journal*, Society of Medical Officers of Health, Medical Superintendents' Society, Association of Clinical Pathologists, British Hospitals Association, Voluntary Hospitals Committee for London, British Hospitals Contributory Schemes Association, Merseyside Hospitals Council, British Dental Association, National Association for the Prevention of Tuberculosis, Royal College of Nursing, Pharmaceutical Society of Great Britain, British Social Hygiene Council, National Ophthalmic Treatment Board, Central Office for Refugees (Medical Department), Central Council for Health Education, the London Hospital, the Westminster Hospital, the honorary medical staff of the East Surrey Hospital, Royal Society for the Prevention of Accidents, Joint Committee of Approved Societies, National Association of Insurance Committees, National Association of Clerks to Insurance Committees, Rotary International, British Medical Finance, Ltd., the Advertising Association, as well as from many individual colleagues and friends.

Mrs. Anderson has received a very large number of letters of sympathy from individual friends in the profession and from committees with whose work her husband was closely associated. She is very grateful for the kind thoughts of all, though it will be appreciated that she finds it impossible to reply to each personally. She hopes that medical friends and colleagues will take this note as an expression of her gratitude for the sympathy so widely expressed to her in her loss.

By an oversight the name of Dr. C. L. Batteson, who represented Epsom College and the London Panel Committee, was omitted from the list of those attending the memorial service at St. Pancras Church, and published in last week's issue.

The Hospital Saving Association has just paid £171,743 to the London voluntary hospitals as a final distribution. This brings the total for the year to £600,193. Once again it has been calculated at 9s. per day for every H.S.A. in-patient and 7s. 6d. for each out-patient. This brings the total distributed by the H.S.A. during its 21 years' existence to just short of ten million pounds. All this money has been collected by voluntary workers, of whom there are now some 13,000 in the Greater London area. The number of H.S.A. groups and contributors is steadily growing.

## CANCER RESEARCH: A COMPLEX PROBLEM

The Duke of Gloucester, in presiding over the annual meeting of the British Empire Cancer Campaign, now in its twenty-first year, spoke of his approaching residence in Australia as Governor-General. He said that this would not mean for him a severance from the Campaign, which is represented by a Branch and by several affiliated organizations in the Commonwealth. The Duke also announced that the trustees of the Bernhard Baron Charities Fund had, for the second time, allocated to the Campaign the sum of £10,000, on this occasion for the establishment of a cancer research fellowship.

The adoption of the annual report—a document almost up to pre-war size—was moved by Prof. E. C. Dodds, F.R.S., who gave a picture in brief of "cancer research as it really is." The whole technique of pathology and biochemical research, he said, had been changed by the introduction of new methods, such as the use of isotopes in studying metabolism, the ultracentrifuge and electron microscope in the study of the form and structure of matter, and the introduction of the cyclotron in the study of matter from the physical aspect. The technical use of these and other instruments required new and deep knowledge of a most complex character, in addition to the knowledge of the problem to which the instruments were applied.

The cancer research worker of the past, said Prof. Dodds, stood no chance of making any fundamental discovery because he was handed a problem far too intricate and complicated in view of the development of his intellectual and scientific processes. It was as though one of the classical Greek philosophers were faced with a modern motor-car engine. All the sciences necessary to its understanding—electricity, magnetism, chemistry, metallurgy—were unknown to him. To-day the research worker in cancer had to start from the beginning. The vast amount of knowledge already accumulated was valuable in plotting out the mountain peaks, but he had now to start on the details, which would take time, though the future looked more certain than ever before.

## Synthetic Oestrogen for Cancer of Prostate

Speaking as one of "the back-room boys" or laboratory workers in the chemical field, Prof. Dodds said that it was with particular pleasure he drew attention to one positive result—namely, the treatment of malignant disease of the prostate with synthetic oestrogens. The American work on the treatment of this disease by the administration of substances by mouth, and the subsequent complete disappearance of symptoms, had been wholly confirmed, and "for the first time in the history of mankind it is possible to state that one form of cancer can be completely controlled and the patient rendered symptom-free by the administration of a few pills by mouth each day."

In the annual report of the Campaign further reference was made to this substance, diethylstilboestrol, the usefulness of which, it was stated, seemed to be restricted to cancer of the prostate, though, even so, a new line of research had been opened up along which in the near future many workers were sure to pass. The substance is a synthetic chemical product resembling a number of glandular products, and possesses many chemical affinities, all of which, in course of time, will be brought under examination.

## Carcinoma in Other Sites

The report also records the work of the Campaign's Clinical Research Committee, which this year presents a detailed analysis of over 1,000 cases of primary carcinoma of the lung. The investigation confirms the finding that cancer of the lung is much more common in males than in females, and it shows that engineers, mechanics, painters, and decorators are more liable to it than other occupational groups—for example, clerks and typists. The difference is said to be statistically significant, but it has to be borne in mind that the average age of the cancer patient is higher than that of the census population, and many clerks and typists change their occupation before reaching the cancer ages.

Some work is quoted from the cancer research committee of the Marie Curie Hospital suggesting that the cervix uteri is one of the sites of cancer in which great improvement might



be expected in the number of cures if intensive propaganda leading to earlier diagnosis were undertaken. Irregular haemorrhage at the menopausal and post-menopausal periods may be significant, and yet it is apt to be regarded by the patient herself as a natural phenomenon, and medical advice is sought only when symptoms become urgent. In the radiological field the work at St. Bartholomew's cancer research department is reported as suggesting that certain types of cancer are curable by high-voltage x-ray therapy (of the order of 1,000 kV), where x-ray therapy of the order of 200 kV produces at most a temporary palliation of symptoms.

Important investigations are being carried out both in London and in the provincial centres of the Campaign with the aid of the substance known as benzpyrene. In spite of threatened shortage the Campaign has been supplied with quantities of pyrene, from which benzpyrene is convertible. The substance figures in the reports from several centres, particularly in the study of the induction of skin cancers in mice. The editing of the report is again the work of Mr. J. P. Lockhart-Mummery, who has undertaken this task now for twenty successive years.

## Nova et Vetera

### THE HISTORICAL MEDICAL MUSEUM

At a recent meeting of the Section of History of Medicine of the Royal Society of Medicine, Sir WALTER LANGDON-BROWN presiding, Dr. S. H. DAUKES, director of the Wellcome Museum of Medical Science, lectured on the future and possibilities of the Historical Medical Museum. The lecture was accompanied by a large model of one of the ten halls of the Wellcome Historical Medical Museum, which is in process of reconstruction, and by an exhibition of rare books from the Wellcome collection. These included a number of first editions, notably a first edition containing all the chief works of Malpighi and a first edition of Morgagni's *De Sedibus*. Over forty works were displayed, and it was stated that fewer than half of them were to be found in the libraries of the Royal College of Physicians or the Royal Society of Medicine.

Dr. Daukes said that a museum must be a living thing with a message, not a valley of dry bones. Too often museums were treated as mausoleums, when they ought to be schools for the creation of ideas and exhibits of raw materials from which those ideas were formed. He liked the definition of a good museum: "Instructive labels illustrated by well-selected specimens." The Wellcome Historical Medical Museum was founded by Sir Henry Wellcome and opened by Sir Norman Moore in 1913. It was unfortunately arranged. There were two types of collector, one who spread a net and the other who used a rod and line, and Sir Henry Wellcome belonged to the former category. He detected some possible value as a museum exhibit in most insignificant objects, with the result that his collection became gigantic—there seemed to be enough weapons from all over the world to arm the Home Guard! His books and MSS. ran into half a million. The crude exhibition at Wigmore Street represented only a small part of the total collection and was never intended to be more than temporary.

#### Plans for Future Display

After Sir Henry Wellcome's death in 1936 it became necessary to examine the material critically, and Dr. Daukes said that, having himself been responsible for the Wellcome Museum of Medical Science, he was given the task of arranging the historical museum on permanent lines. It was desired to preserve the identity of both museums, but to link up their activities. The space available for the Historical Medical Museum consisted of ten large halls on three floors, each hall measuring 110 by 40 feet. The exhibits would be arranged in an order partly cultural and partly chronological as follows:

- I. Cosmogony, palaeopathology, evolution of man, prehistory.
- II. Primitive medicine of all ages, Mexican and Peruvian medicine.
- III. Medicine of Ancient Egypt, Chinese and Indian medicine.
- IV. Greek, Alexandrian, Graeco-Roman, and Byzantine medicine.
- V. Mediaeval medicine.
- VI. Renaissance to end of seventeenth century.
- VII. Eighteenth and part of nineteenth centuries.
- VIII. Nineteenth and twentieth centuries.
- IX. History of diseases (to link up with modern museum).
- X. Central hall with library for reference and research.

In each hall—of course with modifications according to the era—the sequence would be:

Contemporary history as affecting the medicine of the period; general survey; chemistry (or alchemy) and physics in relation to medicine; physiology; anatomy; surgery; medicine, including aetiology (bacteriology, etc.); pathology; clinical aspects, and treatment (rational, superstitious, folklore, etc.); education and hospitals; prevention (social medicine).

It was hoped to have two floors ready within a year of the cessation of hostilities in Europe, and the remainder would be opened hall by hall as it was completed. An elaborate system of labelling and cataloguing would be arranged, and explanatory summaries of the exhibits would be kept up to date. Literature was the backbone of history, and books, MSS., and letters would be freely used as museum exhibits. As a rule literature was used to elucidate the objects; here also the objects would be used to elucidate the literature. Each section so far as possible would convey the atmosphere of its period by large-scale models and tableaux, including, for example, reconstructed pharmacies. There was too much inclination to judge the past in the light of present knowledge; it was necessary always to judge of achievement by contemporary history. Much of Sydenham, for instance, in the light of modern knowledge, would be accounted nonsense, but in the light of contemporary knowledge it was most wise. It was deplorable that younger members of the profession took so little interest in the history of medicine. Teachers might use a few historical details as a kind of *hors d'œuvre* to their lecture, but more than this was necessary; the historical background ought to have a closer practical application. It was hoped that the resources of the new museum would be freely used for illustrating papers and for loans to exhibitions. Thanks to the beneficence of the founder, funds were available for carrying out the scheme.

#### Function of a Museum

Dr. Ashworth Underwood said that Sir Henry Wellcome had much in common with Sir Hans Sloane and John Hunter. All three were great practical men in other fields than museum-making and all three were great collectors, but Wellcome alone was able to provide completely for the future of his collections without the help of State or university. Dr. F. Parkes Weber said that it was high time there was such an undertaking. Careful thought should be given to what was included in a museum of medicine. In his view a Wedgwood medallion of Hippocrates, however interesting as an object of art, had no value in medical history. He would prefer a copper coin from Cos with a portrait of Hippocrates, though that, of course, would not be contemporaneous.

Sir Frederick Kenyon, formerly Director of the British Museum, urged the need for a lecture theatre in association with a museum. He was of opinion also that not all the material should be in the "show window." Sir John Forsdyke, keeper of Greek and Roman antiquities at the British Museum, said that Wellcome's was the best method for the formation of a museum—namely, the accumulation of an abundance of material, with the opportunity of discarding what was not needed, rather than the opposite plan seen in many municipal museums which started with empty shelves. Mr. Arundell Esdaile, secretary of the British Museum, said that there was a great charm about a fortuitous concourse of objects, because it was possible to select from them what was wanted, and nearly always to find a good home for what was not.

Dr. Daukes, in reply, said that there would be an extremely fine lecture hall attached to the museum. He agreed that it was desirable only to show exhibits which answered the immediate purpose, while others were stored and brought out as required, and this plan was being followed. The question of the ethnographical section was being considered very carefully in order to see how far it bore on the history of medicine and how much of it could be allocated to other museums. The Wellcome Museum would be for students in the broadest sense of the word. It would be arranged in bays, so that the student could pursue his work in relative detachment, and portable chairs and tables would be provided which he could carry with him from bay to bay. But it was not intended to provide a peep-show for any casual passer-by on the Euston Road.

The medical teaching film on the diagnosis and treatment of scabies made by the Ministry of Information at the request of the Ministry of Health has been widely shown and has already proved successful. In three months it has been shown by means of the mobile units of the Ministry of Information to 254 separate audiences totalling 21,326 doctors, nurses, and other personnel interested in the subject of scabies, and copies have also been lent out to others who had the use of projectors. A second shorter film, lasting 7 minutes, called "The Scabies Mite," has just been made as a specialized scientific film for specialist audiences. Without touching on the subject of the diagnosis and treatment of the disease it incorporates the photomicrography of the longer film to give a full explanation of the life cycle of the acarus. Particulars of the arrangements which can be made for the exhibition of these films may be had from the Ministry of Information Regional Offices or from the Central Film Library, Imperial Institute, South Kensington, S.W.7.

## Reports of Societies

### CROSS-INFECTION IN FEVER WARDS

At a meeting of the Fever Group of the Society of Medical Officers of Health on Dec. 17, 1943, with Dr. ANDREW TOPPING in the chair, Dr. R. B. BOURDILLON opened a discussion on the control of respiratory infections.

An average vigorous sneeze, Dr. Bourdillon said, emitted 100,000 bacteria-carrying particles, of which in still air about 4,000 would remain suspended half an hour later. Talking emitted fewer particles, the number varying with different people. For three different laboratory workers reading out loud, the total number of infected particles collected per minute was 1,500, 250, and 75 respectively. About half of these were large enough to collect on open Petri plates. A number of different patterns of masks were then shown.

Dr. JOYCE WRIGHT reported the results of an investigation into the control of dust-borne infection in measles wards. In a test ward, in which for three weeks the floor alone was oiled, the haemolytic streptococcal content of the ward air during bed-making was but slightly less than that of a control ward. During this time, and throughout the work, the majority of the aerial streptococci were Type 6. Among the patients' the cross-infection rate with Type-6 streptococci was 58.1% in the test ward and 53.3% in the control ward; the middle-ear complication rate due to Type-6 cross-infection was 18.4% in each. As oiling the floor was evidently not enough to control cross-infection, further measures of dust control—by treating blankets, sheets, patients' garments, etc., with technical white oil—were introduced into the test ward. During the subsequent nine weeks the mean haemolytic streptococcus count in the air of the test ward during bed-making was reduced by 97.5%. Compared with the control ward, the mean bacterial count in the air during bed-making and sweeping was 91% less in the test ward, and the mean haemolytic streptococcus count was 98 to 99% less. Furthermore, the Type-6 cross-infection rate was 18.6% in the test ward, while in the control ward it rose to 73.3%. The middle-ear complication rate due to Type-6 cross-infection was 2.8% in the test ward, compared with 14.3% in the control ward. The results suggested that dust was important in the spread of streptococci in measles wards; that the oiling of bed-clothes, etc., and of floors reduced the infected dust in the air; and that, as a result, the cross-infection and complication rates were lowered. Attention should also be paid, however, to the control of droplet spread, particularly by convalescent patients, and of contact spread by toys, books, baths, etc., and by the nasal toilet.

All but a few of the patients in both wards received an intensive sulphonamide course, usually sulphanilamide or sulphathiazole. The cross-infecting Type-6 streptococcus was found by *in vitro* tests to be sulphonamide-resistant. Differing results recorded by various workers on the prophylactic value of sulphonamides in measles wards might be explained by differences in sulphonamide susceptibility of the cross-infecting strains of streptococci.

Dr. H. STANLEY BANKS, in discussing chemoprophylaxis of respiratory complications, said that the case-fatality rate of measles in the Park Hospital had fallen from 6.3% of 1,290 cases in 1933-4 to 0.3% of 1,625 cases in 1942 and 1943. There was a parallel but less pronounced fall in the incidence of bronchopneumonia, which was chiefly due to the almost total abolition since 1940 of bronchopneumonia occurring after admission. This change exactly concurred with the operation of a scheme of prophylaxis by sulphapyridine for 5 days from admission. Another apparent effect of this chemoprophylaxis was seen in the steep fall in incidence of suppurative otitis media after admission from 13.6% in 1933-4 to 3.8% in the closely corresponding epidemic of 1943. Further analysis showed that this reduced amount of otitis media was with few exceptions in the period after the ninth day from admission—that is, after the chemoprophylaxis had ceased to operate. Such otitis media as there was therefore presumably came from ward cross-infections, manifesting themselves clinically when chemoprophylaxis ceased. To reduce these infections to the lowest level the period of isolation in open wards should be as short as

possible in all uncomplicated cases—e.g., 12 days. Chemoprophylaxis might be extended for longer than five days, but this introduced certain difficulties. But prompt and adequate chemotherapy of these cases of acute otitis media much improved the outlook. The best drug was sulphathiazole and the dosage must be high—as for severe infections—beginning within the first few days—the earlier the better. A course of 9 or 10 days completely cured about two-thirds the cases, and most of the remaining third could be cured a second or even a third course applied without any break after the first. Occasional white blood counts were necessary but young children tolerated the drug remarkably well. More than 90% of the cases recovered within 3 weeks. In the few years of this experiment there had been only four mastoid operations—one each year—whereas in 1938 there had been 19 mastoid operations in the hospital. By means of chemoprophylaxis, chemotherapy, sharp clinical supervision, and isolation periods, morbidity from streptococcal cross-infection could be kept very low even under present working conditions in open wards. These were at least practicable measures. The general use of masks was impracticable, and such measures as oiling of blankets and floors had not yet been proved to be practicable. Dr. Wright's high figures of cross-infections were apt to give a false impression of the magnitude of the problem. They referred only to the peak period of the epidemic and other respects also were exceptional.

Dr. H. J. PARISH thought that spraying with aerosols would not control respiratory infections, as organisms might remain viable for 10 to 15 minutes, during which time infection could take place. He wondered, too, whether oiling of floors and blankets was necessary in modern fever hospitals with good bed-spacing, adequate ventilation, etc. He had seen numerous barriers in use between beds, but was doubtful of their efficiency. Dr. BOURDILLON thought a short barrier opposite the patient's head was an advantage provided the patient could be taught to cough or sneeze directly at it.

Dr. MITMAN said that in combating aerial cross-infection must be realized that hospital air and dust carried a bacterial load enormously in excess of that outside, and that almost all respiratory infections were intramural events. The bacterial load of a room depended on the rates of addition and removal of organisms; measures of control aimed at influencing one or other of these rates. Methods of limiting the rate of addition included the avoidance of overcrowding, observance by individuals of the rules of hygiene, the application of modern architectural and engineering principles to ward construction and the practice of fever-ward management. Guarding the mouth and nose with a big handkerchief during sneezing at coughing should be a cardinal rule of hygiene; masks were merely an extension of this principle. Sneezing into the sleeve should be forbidden as was spitting—a practice now almost eliminated. Those in an infectious state should avoid crowded places and social calls. Dust traps must be avoided in ward construction and furnishing. Medical superintendents should review their hospitals' practice of dealing with blankets after use by a patient. Oiling was only an expedient, and he was convinced that blankets as an article of bed-clothing in hospital wards must go. Only in patients with tuberculosis had the danger of the pocket handkerchief been appreciated. Current methods of removing bacteria, aerosols, ultra-violet irradiation and air-conditioning were still experimental, but ventilation was an old and tried practice of the utmost importance. Wells considered ventilation fair if there are 25 to 100 turnovers per hour obtainable in mild weather with open windows. Fewer than 10 turnovers per hour constituted bad ventilation and was quite common during war if windows and doors were closed and air replacement depended on natural seepage. Good ventilation with a rate equivalent to 100 to 500 turnovers per hour could be obtained only by the use of germicidal ultra-violet lamps irradiating the upper air—equivalent to removing the ceiling and ventilating upwards.

Dr. W. GUNN said there was probably a future for ultra-violet irradiation for checking cross-infection, but not until dust was satisfactorily eliminated, as it protected the organisms from the lethal effects of radiation. The cross-infection and complication rates recorded in Dr. Wright's communication appeared high compared with hospital figures for other measles epidemics but the experiment took place over a short period at the

height of a severe epidemic when some degree of overcrowding could not, for a variety of reasons, be avoided.

In reply to a question, Dr. BOURDILLON said that for hospital purposes with unlimited laundry facilities he favoured the gauze mask provided it was changed frequently. On the subject of ward ventilation he felt that very high rates of air-exchange could not be tolerated by the older patients, who felt much too cold.

## Correspondence

### The Nature of Concussion

SIR,—I was very interested to read Prof. Jefferson's article (Jan. 1) on concussion, especially those parts of it which dealt with consciousness and unconsciousness, my special interest being in the *recovery of memory* in these cases. Medical psychologists are very familiar with cases of traumatic amnesia in which there is no discernible organic change, but in which there is loss of memory, which is recoverable, and, indeed, is often spontaneously recovered. Where is the dividing line between these cases of psychological amnesia and cases of the unconsciousness of concussion? I have come to the conclusion that there is no specific dividing line on the psychological side, a conclusion based on the fact that even in cases of severe concussion the *whole* memory of the experience and accident is recoverable by methods of free association, hypnosis, and narco-analysis. If that is so, obviously whatever happens in concussion is not something which so affects the brain that consciousness is obliterated.

For the space of 18 months in the last war, in a ward of 60 "shell-shock" patients, I paid particular attention to the complete recovery of memory in those cases of concussion (in which there is no discoverable physical injury) as a method of treatment, and never failed to recover the memory of the traumatic experience *in detail*. This has been repeated by many physicians in the interval between the wars in cases of concussion as from car accidents, and in many cases in this war. A recent case is that of an A.R.P. warden, who was blown up in the road during the London "blitz" by two shells one on each side, had amnesia for four days, and for eighteen months suffered from severe headaches, insomnia, and severe pain in his neck, which was flexed on the chest as though broken. The whole memory was recovered of the explosions, the blasts of air, being carried up the height of a suburban house, his thoughts while in the air (that he must at all costs avoid the spiked railings: that he must fall in a way so as to break the fall as he had learnt in wrestling), his crash on his back in a field 20 yards away, the awful jerk of his neck forward as he had his helmet on, lying there thinking he was dead ("So this is death!"), that Tom R. would be coming round to do his gracious job of putting his dead body in his sack; and then his realization he was not dead. He subsequently had a fugue state with loss of memory for four days, during which he wandered about London visiting streets where he had never been before, the names of which he confirmed by visits after his recovery. All these experiences were *relived* and remembered, with the result that he completely recovered and has now started a new business of his own.

The recovery of such lost memories is a familiar technique of every medical psychologist who uses abreaction as a form of treatment. To say, as one writer does, that psychological "amnesia" relates to the part of the experience which we can recover, and "concussion" to what we cannot recover, is to make the diagnosis of concussion depend on the skill and patience of the physician. Failure to recover is usually due to lack of persistence. That these memories are not merely imagined is proved by the fact that the patients subsequently clearly remember these experiences like any other. It is also an interesting fact in contrast with these cases that when the patient is put under an anaesthetic during the period of amnesia, he cannot recover any memories of the surgical operation (as we should expect that he would not); and we have also failed to recover the memory in cases of contusion—such as fracture of skull—these failures acting as a "control," indicating the genuineness of the memories in concussion.

Obviously the "concussed" patient is not altogether unconscious, though he appears to be so; rather he suffers from amnesia. We suggest, however, that in these cases of concussion the patient is in a *low state* of consciousness, which is, therefore, not recalled in the full and lively consciousness of ordinary life. An analogy to such dissociation is found in the fact that we may get up in the night, carry out some routine act like closing a banging door, and yet recollect nothing of it in the morning. We are in a somnambulant twilight state of consciousness, which seems to be the state of the patient with "concussion." The amnesia in such cases may be due to the fact that the experience is on a different level of consciousness, and therefore dissociated from ordinary consciousness, as indeed it is in states of hypnosis. For that reason we welcome Prof. Jefferson's use of the term "stupor," for in a case of stupor the patient can often hear and understand what is said though unable to respond, as is also frequently the case with a patient going under an anaesthetic who hears the remarks of those around. Prof. Jefferson's other term "parasomnia," which he defines as a "state in which there is no response to stimuli, verbal or mechanical, except those of a reflex nature," does not rule out consciousness, for we may be conscious without being able to respond in any way, even reflexly. Lack of response does not necessarily imply lack of consciousness.

Again, Prof. Jefferson says that the muttering of the concussed patient shows that cortical actions continue: it also suggests that consciousness is maintained as our experiments seem to prove. If it is true, as Prof. Jefferson says, that "the beliefs expressed above have minimized the importance of the cortex in the picture of concussion," this also is in keeping with our psychological experiments, which indicate that consciousness and therefore cortical function is maintained in "concussion," though in a low form. So far, Prof. Jefferson's observations support our conclusions. But in so far as Prof. Jefferson is out to prove that, because the cortex is not put out of action, the unconsciousness must relate to some other part of the brain, this is negatived if consciousness is proved *not* to be obliterated.

Indeed, any definition of "concussion" based on the idea that in concussion the brain as a whole or any of it is so put out of action that consciousness is obliterated is untenable, since consciousness seems to persist throughout, and can be recovered.

Finally, the definition of "consciousness" as a state implying "insight" is surely unsatisfactory as a definition, for it defines an unknown by a more unknown, for what is insight but a state of consciousness or awareness of the object: indeed, insight implies more than consciousness, since it also implies awareness of the *meaning* of an object.—I am, etc.,

Psychological Department, King's College.

J. A. HADFIELD.

### Sciatica

SIR,—Prof. Platt's letter (Jan. 8, p. 57) is interesting but not very helpful, because he does not tell us what in his opinion is the common cause of sciatica. Surely there must be at least one common cause for so common a complaint. I agree that true sciatic neuritis is comparatively rare, and that the really common cause of sciatica must be sought elsewhere. It is not to be found in the spinal tumour or in the prolapsed intervertebral disk. Prof. Platt speaks with some enthusiasm of the prolapsed disk and of the rich harvest of cures by removal of the projecting fragment in *cases selected from the large numbers of sciatica patients* who continue to find their way to orthopaedic surgeons (italics mine). The truth is that, in spite of all that has been written and said about it, the prolapsed disk is a comparatively uncommon condition. In the largest series of cases hitherto published (300 cases from the Mayo Clinic) the incidence was 3 to 4% of sciaticas, which means that 96 to 97% of sciaticas are *not* due to prolapsed disks. Visceral pelvic disease is common, but not as a cause of sciatica in orthopaedic practice. Destructive lesions (inflammatory or new growth) of the lumbar spine, pelvis, and femora are not common, if we except tuberculous disease of the hip, which is not a cause of sciatica. Tuberculous disease of the sacro-iliac joint is a definite cause of sciatica, but it is itself a rare disease. Neither sacro-iliac strain nor lumbosacral strain is ever a cause of sciatica. It is curious that, in giving

an example of referred sciatic pain, Prof. Platt should have singled out osteo-arthritis of the hip. This is mentioned as a cause of sciatica in all the textbooks, and it has been copied from book to book for many years. But osteo-arthritis of the hip is practically never a cause of sciatica, although many patients with osteo-arthritis of the hip also have osteo-arthritis of the lumbar spine.

What does it all boil down to? What have we got left? What is the really common cause of this very common complaint? Prof. Platt says that "the causal lesion in a large group of cases is to be discovered in that complex system of articulations embraced by the lumbar spine and the sacro-iliac joints." This sounds very impressive, but it means precisely nothing, unless by any chance it means spinal arthritis! There are quite a number of these little joints, but there is nothing particularly complex about them and they behave very much like any other joints. The mystery deepens when we come to Prof. Platt's last and apparently most important group of cases—namely, "pseudo-sciatica—fibrositis of the fascial, ligamentous, and muscle masses in the lumbar region, buttocks, and thighs." There is not a shred of evidence that any of these conditions is directly concerned in the causation of sciatica. A patient either has sciatica or he has not. Pseudo-sciatica may well rank with P.U.O., D.A.H., and other well-known subterfuges in the absence of a correct diagnosis.

Prof. Platt is right in saying that I have never claimed the "vertebral arthritis theory" as my own creation, but he is wrong in saying that it has my unqualified support, because I have always recognized that there are other causes of sciatica. However, I do know that the majority of my patients with sciatica have symptoms and signs of spinal arthritis and that they respond to the appropriate treatment. What are the majority of Prof. Platt's sciatica patients suffering from?—I am, etc..

London, W.1.

A. S. BLUNDELL BANKART.

SIR.—While I am in agreement with much of Mr. Harry Platt's reasoned and in many ways skilful defence of the orthopaedic surgeon's point of view with regard to sciatica—particularly do I like his five clinical groups—I take exception to what he says about manipulation. Many years before Goldthwait and Osgood of Boston ever mentioned sacro-iliac joint strain in connexion with sciatica, osteopaths had pointed out that many cases of sciatica were due to postural defects or to positional "lesions"—strains, if you prefer it—of one or more joints in the pelvis and lumbar region.

Why orthopaedic surgeons experience "far too many failures" after manipulation is due largely to their faulty technique. In the vast majority of cases a forced manipulation, with the patient under an anaesthetic, is given by an orthopaedic surgeon, and the patient is then handed over to the care of a masseuse for subsequent treatment. Orthopaedic surgeons learn their manipulative technique on anaesthetized patients, when the whole question of active joint strain and protective spasm of muscles and ligaments is eliminated by anaesthetic. Little or no effort is made really to understand the mechanical problem of each individual patient and each particular joint is mainly or primarily on strain. I have treated many hundreds of cases of sciatica by osteopathic manipulation with a very high percentage of pleasing results, both with and without anaesthesia. Practically never, however, have I succeeded in entirely curing any case of sciatica after one manipulation under anaesthesia. In the cases where I have resorted to anaesthesia it has always been necessary to continue manipulation, without an anaesthetic, for a varying period of time afterwards, until the tension in the joint and the protective spasm of the muscles and ligaments are entirely eliminated, and the patient's faulty posture is corrected; this necessary result cannot be attained by one manipulation under anaesthesia. I have only resorted to anaesthetics in cases where there has been some psychological necessity on account of the fear of pain, the extreme protective spasm of the lumbar muscles making it entirely impossible to obtain any movement whatever without an anaesthetic, or possibly in some cases on account of the possible saving of time.

I seriously put forward this criticism of orthopaedic surgeons' technique as the real reason why they get such a high percentage of failures from manipulation, and nowadays are so prone to

remove an intervertebral disk instead, and I suggest that if they elaborated their manipulative technique along the lines I have indicated they would get better results and find less necessity for resorting to serious surgical intervention. Perhaps they prefer surgery.—I am, etc.,

London, W.1.

GEORGE MACDONALD.

### Treatment of Sciatica

SIR.—Sir Arthur Hurst raises some interesting points in the *Journal* of Dec. 18 (p. 773). In the course of over 15 years' experience in an electrotherapeutic department a large number of these cases have passed through my hands. During my first few years I found that very variable results were obtained in these cases, whereas a much quicker and more consistent response to treatment was obtained in cases of brachial neuritis. This called for careful thought, and I came to the conclusion that the essential features responsible for the good results in the latter group were: (1) The arm is kept in a sling until the pain has diminished considerably. (2) The diathermy or short-wave current is passed through the entire upper extremities, and including particularly the cervical plexus in its path. On a number of occasions when patients have not been responding well I have found that the assistant has not placed the upper pad (or condenser) sufficiently high to include the cervical plexus in the path of the current; when this has been corrected all these cases improved rapidly. This convinced me that the origin of the condition was situated in the region of the roots of the nerves.

On attempting to apply these principles to cases of sciatica certain difficulties were encountered. It is not possible "to put a leg in a sling," and during the acute stage I found that the exertion of moving from a chair to the treatment room more than counteracted the beneficial effect of any form of physiotherapy. For this reason I advise complete rest in bed during this stage. Until 1934 these cases were treated by diathermy, and particularly in thick subjects it was not possible to obtain an effective concentration of the current through the lumbar plexus. With the introduction of short-wave therapy and the adoption of the Schliephake three-condenser technique it became possible to include the entire course of the sciatic nerve in the tract irradiated, and a marked improvement in our results was obtained.

Sir Arthur states: "The few patients who do not get well after a month of complete rest in bed are among those who give a history and show physical signs of root pressure. A further period of complete rest may still lead to recovery, but if there has been little or no improvement they should be referred without further delay to a neurosurgeon, who will cure them by removal of the herniated intervertebral disk." The great majority of our cases do not come to the department until they have had several weeks' rest in bed and are still complaining of considerable pain and disability. At this stage short-wave therapy is given daily for two weeks, and at the end of this period a marked improvement is seen in their condition; treatment is usually continued three times a week for a further two weeks if necessary, but a number of cases are completely cured in two weeks. As soon as the acute phase has passed, massage and exercises are given. If it is possible to admit the patient to hospital, treatment may be started at an earlier stage.

These observations support Sir Arthur's view that the pain frequently arises in the roots of the sciatic nerve, and suggest strongly that neurosurgical procedures are not indicated in the great majority of these cases until there has been a period of rest followed by a course of short-wave therapy.—I am, etc.,

Jpswlch.

C. H. C. DALTON.

### Shock Treatment of Mental Disorder

SIR.—Dr. Winnicott's provocative letter will probably bring many replies from psychiatrists who have obtained good and lasting results from shock therapy. It is now possible to employ a criterion on results obtained in those cases remaining well some years following discharge from mental hospitals. In spite of some conflicting statements these results appear to justify the validity of individual experiences.

After four years' experience of all modern methods of shock therapy employed in mental hospitals, I am convinced of its value in carefully selected cases. I might add that

these four years follow twenty years of psycho-analytical work. The value of insulin shock in schizophrenia appears to me to be largely due to the greater facilities for employing psychotherapy during the actual treatment. This led me to favour the intramuscular injection of triazol, azoman, etc. The latter technique allows an interval for psychotherapy before the convulsions. The more or less acute anxiety occurring during this period is generally of a regressive type, and if desired can be used as a method of forcing a transference situation. The good results following electric shock therapy employed in involuntional melancholia speak for themselves.

I believe that shock therapy combined with psychotherapy offers a new and promising approach in the treatment of the psychoses, and until a less drastic approach is discovered its condemnation is unjustifiable.—I am, etc.,

Dartford.

ROBERT M. RIGGALL.

SIR,—Although I am a psychiatrist and psychotherapist who does not personally give electric convulsive therapy, I cannot let Dr. Winnicott's letter on this subject pass unchallenged.

First, I should like to know what evidence Dr. Winnicott has for saying that a patient who consents to this treatment is doing it out of an impulse akin to a suicidal one. Having seen many patients who have consented to, or even asked for, this treatment I myself can produce no similar evidence. Secondly, it is surely fanciful to suggest that one orders it as a punishment to the patient for not getting well. On the contrary, the physician who insists that the patient shall get well by the treatment which he himself is able to administer or not at all is actually punishing the patient much more severely!

Psychotherapy is as yet far too immature a science for its exponents to say dogmatically that it is the answer to every psychiatric illness. One has seen far too many cases going on for month after month, and even year after year, with psychological treatment which is doing no good whatever. To find a treatment that in suitable cases offers speedy and sure help to these unfortunate people is one of the greatest advances which medicine has made, and it would be a thousand pities if any part of the profession was prejudiced against it, either on the score that it is delaying a knowledge of psychopathology or on the score of dogmatic and unproved psychological assertions.

Dr. Winnicott does not seem clear that the choice of treatment in psychiatric illness must, as in other branches of medicine, depend upon diagnosis, or that there are certain forms of illness—such as anxiety neurosis—for which, other things being equal, psychotherapy is the method of choice; and others—notably involuntional depression—where psychotherapy is useless and electric convulsive therapy is 80% effective. If he has not read Sargant's and Sands's work on the latter I am sure he would find it of interest. It is a patent misconception to suppose either that the two methods of treatment are interchangeable or that the one is a "short cut" to the other.

Finally, is it ethical to refuse any patient the appropriate treatment for his illness because to do so might advance our knowledge of pathology?—I am, etc.,

London, W.1.

MARION GREAVES.

### Teaching of Anaesthetics

SIR,—I am sure all teaching anaesthetists will agree most heartily with the points raised by Dr. K. G. Lloyd-Williams (Dec. 25, p. 827) with reference to the instruction of medical students. For many years newly qualified practitioners have complained with some bitterness that the methods of anaesthetic administration employed in hospital practice are too complicated for use outside. Now that specialist anaesthetists are in short supply the position has become acute, and the ignorance displayed by the average house-surgeon regarding the elementary principles of anaesthesia is truly amazing—not to say terrifying! In the various E.M.S. hospitals which have sprung up all over the country many anaesthetics have to be administered by residents (and others) who have had no special training in anaesthesia, and their well-meant but hair-raising attempts to produce scientific asphyxia are a continual source of worry to the visiting surgeons.

No useful purpose will be served by blaming the honorary anaesthetists at the teaching hospitals, most of whom do their best for patient, surgeon, and student, often under very trying conditions. It has long become evident, however, that modern anaesthesia is a highly specialized subject which cannot possibly be taught to medical students in the short time available. Furthermore, as Dr. Lloyd-Williams points out, the main operating theatre, with its list of gastrectomies, thyroids, and gall-bladders (not to mention exacting and temperamental surgeons), is no place for the beginner in anaesthesia, and the sooner this is realized by the academic and hospital authorities the sooner will a satisfactory solution be arrived at.

The present system, whereby the student goes the round of various operating theatres, picking up indiscriminate information as he goes along, is confusing and unsatisfactory for many reasons. For one thing, not all honorary anaesthetists are good teachers. Would it not be far more satisfactory for each hospital or medical school to appoint an anaesthetic tutor, who would be responsible for teaching students the cardinal principles of anaesthesia in the same way that the surgical registrar instructs the dressers in the elementary principles of surgical asepsis, case-taking, and the like? Under his supervision anaesthetic clerks would spend the first part of their course (say, two weeks) learning: (1) clinical signs and symptoms of the various stages of anaesthesia; (2) how to maintain a free airway; (3) the recognition of normal and abnormal respiration; and (4) how to administer a simple routine "open" anaesthetic. With the co-operation of the R.S.O. special lists could be arranged of relatively minor operations, so that each student would gain practical experience of the right kind. The third week could be devoted to giving short anaesthetics with nitrous oxide or intravenous drugs in the casualty, dental, and maternity departments, while the fourth and final week might be used for purposes of revision. At the end of the course each student should undergo a practical test by the senior honorary anaesthetist or lecturer, and any student falling below a certain standard would be compelled to take a further two-weeks course.

Where do the honorary anaesthetists come into the foregoing scheme? In my opinion the most useful plan would be for each honorary to give one demonstration in some special method of anaesthesia at the end of the ordinary course—e.g., basal anaesthesia with nitrous oxide and oxygen for toxic thyroid cases, cyclopropane-oxygen with carbon dioxide absorption and "controlled" respiration for thoracic surgery, spinal and regional analgesia, and so on. This would enable the student to appreciate the advantages of modern technique without being expected to take any active part in it. If any particular student wished to learn more about modern methods he would naturally take a postgraduate course in anaesthesia after qualifying.

The appointment of an anaesthetic tutor would lead to all sorts of advantageous possibilities from the point of view of the hospital. As in the case of resident surgical officers or registrars he should be a young man at the beginning of his professional career, preferably with not less than twelve months' experience as resident anaesthetist. In addition to teaching students he would be responsible for training and supervising the residents, and might also undertake difficult emergencies or assist in the special departments. Last, but decidedly not least, he could be responsible for keeping the hospital records up to date.—I am, etc.,

Newcastle-upon-Tyne.

PHILIP AYRE.

### Cerebral Malaria

SIR,—I beg space to add a postscript to Surg. Lieut. I. B. Sneddon's article (Dec. 25, p. 814). I write as one with fourteen years' experience of tropical work in Malaya and two in West Africa. In Malaya my partners and I were responsible for the health of some 80,000 Asiatic workers on rubber estates and tin mines, as well as a great number of Europeans. Cerebral malaria was relatively common, the Malayan strain of the subtropical parasite being, in my experience, infinitely more virulent in this respect than the West African. We lost very few cases indeed—not one being a European—in all those years, and the reason was, I am sure,



that we did not spare the quinine. Adult cases were given two, and sometimes three, intramuscular injections of 15 gr. of quinine daily. These were given into the upper and outer quadrant of the buttock. I have never seen any untoward effects from this dosage, nor have I ever had a quinine abscess of the buttock, even after repeated injections, as a sequela. Usually two or three injections suffice, but if vomiting or coma persists the injections have to be continued until these signs disappear.

My top score for any one case was the rather amazing number of 14 injections of 15 gr. each, spread over seven days, and the patient, one of my Indian assistant surgeons, made an excellent recovery, and was extraordinarily grateful for the cure, particularly as he himself had lost a case of cerebral malaria—his European estate manager—two months previously. This manager had refused to take quinine in sufficient dosage, either by mouth or by injection, as he averred that he only had a "headache" and he saw no reason why the assistant surgeon should fill him up with quinine when aspirin was the thing for a headache. He became comatose and died on his 90-mile journey down from the Ulu to hospital.

The moral is—and here I agree most heartily with Dr. Minett of the Gold Coast, who wrote in the same strain a few weeks ago—that one must take extremely energetic steps with any case of malaria, particularly subtertian, that suffers from a really severe headache or that appears to be semi- or fully comatose.

In contradiction to Lieut. Sneddon's statement that one usually finds a large number of parasites in the circulating blood in comatose cases, my experience has been the opposite, and some of my worst cases have shown only one or two parasites in a complete thin film. On the other hand, I have seen parasites in one field so numerous as to be almost uncountable, and yet the patient never showed any signs of the cerebral condition.

Give your quinine in ample doses—30 to 45 gr. daily—by injection, whether intravenously or intramuscularly I care not; though personally I found it more convenient to give by the intramuscular route. The boggy of quinine abscesses need not arise if one is certain of the sterility of syringe and quinine solution, and if one ensures that the injection is intramuscular and not merely into the subcutaneous fat of the buttock. I have always used ampoules containing 15 gr. of quinine bishydrochloride in 2 c.cm. of water, and, it is almost unnecessary to state, boiled syringe and needle before each injection.

If the many doctors, both at home and abroad, who are coming up against malaria for the first time and who regard it as a rarity, would stop "dabbling with 7½ gr. of quinine at a time and then waiting to see what the effect is," and give instead at least 30 gr. daily, we would have to record far fewer of these sad cases of fatal malaria—sad because useful lives are thrown away that might have been saved.—I am, etc.,

I. G. CAMERON,  
Major, R.A.M.C.  
Medical Specialist (Tropical).

SIR,—In 1937 I had a rather similar case of cerebral malaria, blood, etc., in the urine, to that reported by Dr. Sneddon (25, p. 814). I was a resident in Manchester Royal Infirmary at the time. The patient was the soldier son of my wife's landlady. He had just come home on leave from Palestine, and was apparently in the pink of condition. (It was the time of the intensified disturbances in Palestine.) I had been introduced to the boy on his arrival home, and when I heard that he was dangerously ill with acute nephritis and delirium I was puzzled. I presumed on the family doctor's courtesy and took a blood slide, for it occurred to me that the patient might conceivably be the victim of malignant malaria.

It was fortunate in this instance that I had overstepped my position, for the slide (which I still have) showed numerous crescents (both male and female) of malignant malaria—i.e., *Plasmodium falciparum*. After informing his doctor it was arranged that the patient should be admitted to Manchester Royal Infirmary, where, if memory is correct, he was treated with quinine and plasmoquin. After a sharp illness the man subsequently recovered and was discharged some weeks later.—I am, etc.,

Conon Bridge.

KENNETH I. E. MACLEOD.

## Population Problems of India

SIR.—It is surprising to see put forward in all seriousness in a scientific journal the dismal and long-discredited theories of the reactionary parson Malthus, which have long been laughed at by scientists and economists of all schools. Prof. Blacklock does not suggest in his article on the population problem of India (Dec. 25, p. 805) that the present terrible famine in India is due to over-population, but there is as much justification in arguing this as in visualizing future famines in India due to over-population. "Where is the Indian Malthus who will inveigh against the devastating torrent of Indian children?" asks a leading economist.<sup>1</sup> And another,<sup>2</sup> "India seems to illustrate the theories of Malthus." Let us examine the arguments of this new "Indian Malthus."

He puts forward assumptions based on the presumed application of the principles of the Atlantic Charter to India, but have we not already been informed by Mr. Churchill that the Atlantic Charter does not apply to India? Some 247 persons per square mile seems a great density of population until we compare it with that of England and Wales, which in 1931 was 685 persons per square mile. Further, while India's population between 1881 and 1931 increased by almost 40%, that of England and Wales increased in the same period by almost 60%—that is, by half as much again.

Considering the problem of food production, the solving of which is the key to India's future, we find that in four years in Great Britain the amount of food produced was doubled (1939-43)—that is, we now produce two-thirds of our food instead of one-third, as we did before the war. Many agricultural experts assert that we are quite capable of producing all our food requirements in Britain. Let us now consider India. The following quotation<sup>3</sup> refers to Bengal, the most densely populated part of India: "... Of the total area cultivable only 67% is now actually under cultivation. If the total cultivable area were brought under cultivation, and if improved methods of cultivation yielding an increase of 30% over the present yield were adopted, it is clear from a simple rule-of-three calculation that Bengal could support at its present standard of living a population very nearly twice as large as that recorded in 1931." One can add that if it is humanly possible to multiply food production by three in Britain, it cannot be impossible in Bengal.

Instead of homilies about restraint and birth-control I would suggest that British medical men interested in the future of India should advocate the application of the Atlantic Charter principles to India, which would give her the right to self-government—a necessary preliminary to improvement in the food situation or anything else.—I am, etc.,

Nelson, Lancs.

T. D. CULBERT.

## REFERENCES

- <sup>1</sup> V. Anstey, *Economic Development of India*, p. 475.
- <sup>2</sup> L. C. A. Knowles, *The Economic Development of the British Overseas Empire*, p. 351.
- <sup>3</sup> *Bengal Census Report*, 1931, 1, 63.

SIR,—India's growing population has been blamed by the spokesmen of the British Government for the present famine and also for the poverty, ill-health, and low standard of life of the Indian masses. Prof. D. B. Blacklock's article is also written in the same vein. He may have meant well, but his references to the Atlantic Charter make your Indian readers and many others very suspicious.

India is not the only country with a rapidly increasing population. In fact she is far behind the big European countries in this respect, as the following figures show:

## Increase in Population in 50 Years

Russia	..	..	..	..	..	73.9%
Holland	..	..	..	..	..	62.0%
Germany	..	..	..	..	..	59.0%
England	..	..	..	..	..	58.0%
India	..	..	..	..	..	18.9%

These figures show that the population problem should be considered more serious in this country than in India, especially when everyone knows that even with the most modern methods England cannot feed more than half of her population. Yet people here are being advised and encouraged to have more babies. Why? Because it is not only the land that counts but also the industrial production. Prof. Blacklock presupposes



that India will remain mainly an agricultural country, perhaps because the policy of British capitalists has been to keep India only a dumping ground for their goods. But India can be made a great industrial country.

The Indian problem cannot be solved by limiting the population alone, but by better education, better health and social services, modern methods of agriculture, and industrial development. Who can bring about these changes? As Prof. Blacklock rightly points out, this is the responsibility of Indians themselves. But have the Indians got sufficient power to bring about these changes? The answer is in a big NO. Only an independent Indian Government will have the power, the courage, and the resources necessary for such changes.

Prof. Blacklock tells us that out of 6,000 civilian doctors in India only 200 are British. But he does not tell us that these 200 have the real power. They control all the highly paid key posts and frame the policy. They derive their instructions from Whitehall. Only one example will prove it. Recently a Commission was appointed to report on reforms in the I.M.S. All its members were British, so was Mr. Souttar, its chairman. And India has dozens of medical men as capable as any member of the Commission.—I am, etc.

Birmingham

D. R. PREM.

### Hypoglycaemia

SIR.—Recent correspondence on this subject has indicated that spontaneous hypoglycaemia occurs rarely, and that it is suspected too frequently, and is "overdone as an explanation for minor indispositions." It has also been pointed out that hypoglycaemia may be a concomitant of a number of disorders. It may be that the swing of the pendulum has gone too far, and a corrective to over-zealousness was well warranted. It is, however, not so many years ago since endogenous hypoglycaemia was entirely unsuspected—at least by the majority of physicians—as a cause of convulsions, or loss of consciousness, or peculiarities of behaviour; and publications of such cases in recent years still show that the diagnosis has often been missed by one or more physicians.

Although it is true that the diagnosis of endogenous hypoglycaemia is often invoked without sound evidence to explain minor indispositions, it is also true that fatal hypoglycaemic coma may occur in the course of three major endocrine disorders—namely, Addison's disease, Simmonds's cachexia (anterior pituitary deficiency), and adenoma or carcinoma of the islets of Langerhans in the pancreas. Addison's disease should, of course, be diagnosed on clinical evidence, and often is. Nevertheless, in the course of the disease a severe or fatal endogenous hypoglycaemic attack may occur, and its true nature remain unrecognized. This complication is more likely to occur when desoxycorticosterone therapy is used in preference to cortical extracts, which also contain the corticosterone carbohydrate regulating factor. (Nevertheless desoxycorticosterone is completely adequate therapy with some patients.) Simmonds's cachexia may be atypical in its manifestations, especially when following parturition, and the original disorder, as well as the incidental hypoglycaemia, may remain undetected. A pancreatic islet tumour may well be unsuspected because of its rarity. If the diagnosis of Addison's or Simmonds's disease is made, adrenal cortical extracts will tend to prevent hypoglycaemic attacks; and the latter will be more specifically guarded against when the pure corticosterone factor becomes available commercially. If a pancreatic islet tumour is diagnosed, laparotomy and removal are indicated.

These few comments in no way detract from the validity and value of the observations made by previous correspondents on this subject, but serve, I venture to hope, to stress another aspect which is not unimportant.—I am, etc.,

London, W.I.

S. L. SIMPSON.

### Obstetric "Shock" or Haemorrhage?

SIR.—We have read with interest the short article on blood transfusion in "obstetric shock" (Dec. 18, p. 781), and the subsequent correspondence. From this four points emerge for discussion. First, the use of the term "obstetric shock"; secondly, the beneficial effect of transfusion in conditions so described; thirdly, the complete absence of haemoglobin estimations throughout the whole series of cases quoted; and, fourthly, the persistent statement that haemorrhage had not been excessive.

We have had a very extensive experience of transfusion in such cases, and the obstetrician has always made the diagnosis of "obstetric shock"—and amplified it by the statement that haemorrhage had not been excessive. Haemoglobin estimations have always been made by us before and after treatment, and treatment has always consisted of much more massive transfusion than any of your correspondents have described. The haemoglobin percentage may or may not have been below normal before transfusion was started, but it has never been above normal during the three days after transfusion, and has frequently been as low as 70%. The minimum volume transfused has been three pints of citrated blood, and the majority of such patients have received five to seven pints of blood. Before transfusion the pulse rate has been raised, 110 to 140 per minute, but has fallen as transfusion proceeded. Where retained placenta has been the cause of the so-called "shock," removal of this organ has been successfully accomplished after transfusion, no matter how severely ill the patient may have been, and the conclusions that we have arrived at are either that severe anaemia is the precursor of the retained placenta and obstetric shock or that severe haemorrhage has always occurred in our cases of "obstetric shock," haemorrhage being much the more likely diagnosis.

We cannot imagine how any patient can accommodate within the circulation five pints of blood, often transfused at an extremely rapid rate—two pints during the first quarter of an hour and a further two pints in the next half-hour—if there has not been a corresponding loss of blood volume preceding the transfusion. If the space available for this transfused fluid is due to dilatation of the vascular bed rather than loss of fluid, then transfusion of whole blood should raise the haemoglobin to a level of 150% or thereabouts when the patient has recovered. We firmly believe that the use of the term "obstetric shock" should be abandoned; all cases that we have seen have been due to blood loss as judged by comparison of the haemoglobin levels before and after transfusion of whole blood, and this in spite of the fact that obstetricians generally say that blood loss has not been excessive. In the great majority of cases the obstetrician has not been present throughout the course of labour to see for himself what has taken place, but it is easy to convince oneself of the correctness of our contention if haemoglobin estimations are made in all such cases before and after transfusion.

Only when the term "obstetric shock" is abandoned in favour of the term "obstetric haemorrhage" will the treatment necessary in these cases be recognized and applied. In support of this contention we would quote one case of complete inversion of the uterus. After replacing the uterus this patient received fourteen pints of citrated blood, and within thirty-six hours had a normal pulse rate, 100% haemoglobin, and thereafter a normal puerperium.—We are, etc.,

J. MILLS.

P. KIDD.

L. DOWSETT.

Pathological Laboratory, Royal Berkshire Hospital.

### Treatment of Gonorrhoea in the Female

SIR.—The excellent summary of the modern treatment of gonorrhoea in the female by Brig. T. E. Osmond (Jan. 8, p. 51) has stimulated me to comment upon the local activity he recommends in labour and the pyrexial puerperium.

Instead of his recommendation that when labour starts an endeavour should be made to cleanse the birth canal, I would advocate that only the vulva be kept as clean as possible, and that the aim should be to carry out no vaginal or rectal examination throughout labour, or even late in pregnancy. In managing the labour the abnormalities should be detected by other means than by vaginal or rectal examination. When operative intervention is judged to be necessary the cleaning of the vagina and performance of the internal examination are best made under the anaesthesia.

In the puerperium in these contaminated cases no condition except vaginal haemorrhage, severe or repeated, should provoke local intervention, even of as gentle a nature as the passage of an intra-uterine catheter and the instillation of glycerol as recommended by Brig. Osmond. The efficiency of this policy of intervening even less than in non-veneral cases has been confirmed over many years.—I am, etc.,

London, W.I.

AMY M. FLEMING.

## Scabies

SIR,—I should like to implement some of Dr. Mellanby's observations in his letter (Dec. 18, p. 795). First, regarding one-application treatment. The figures for the year 1943 are not yet complete, but a rough survey indicates that relapses are very infrequent—in fact, well below 1%. The following investigation carried out by the charge orderly at the treatment centre proves the efficacy of the one-treatment method. Eighty persons were chosen who on the first examination had live mites on the hands and/or wrists; 40 were treated with the lanette wax benzyl benzoate emulsion 20% and 40 with triethanolamine stearic acid B.B. preparation, also 20% B.B. A total of 974 mites were taken from the 80 patients following treatment—i.e., average of approximately 12 mites per case; all the mites on test were found to be dead. The times between treatment and the test of the mite being dead varied between a quarter to half an hour. In no case did more than half an hour elapse between treatment and test.

Another investigation carried out showed that home treatment is, generally speaking, a failure. It is known that sulphur ointment, benzyl benzoate, and demethyl-diphenylene disulphide (D.D.D.) are all efficient sarcoptocides. Patients are questioned as to any treatment just before attendance at the centre; if any medicament other than those mentioned had been used the case was ignored. The patient's hands and wrists were carefully examined for mites; if no mite was found the case was ignored; if one live mite was found it was obvious that treatment had not been successful. A total of 347 patients had used one or more of the three above-mentioned medicaments; in 15 cases only were all dead mites found—a success rate of 4.31%.

With regard to reinfestation from fomites, I consider this plays a minor part in the spread, and from a local authority's point of view the disinfection of the fomites would divert man-power and money for very minor results. For example, in the areas served by the Poolsbrook Treatment Centre, if disinfection of clothing, bedding, etc., were carried out it would mean the employment of an extra driver and van doing a mileage of 30,000 annually. In addition an extra man would be required to attend to the disinfectant, etc.—a bill of roughly £490 per annum in wages and £750 in running costs of a van. This does not include cost of fuel and "wear and tear" of the disinfectant. This sum would represent over a penny rate for the authorities concerned for a reduction of 1 to 2% at the most in the reinfestation due to fomites.

To combat scabies successfully there should be a really well-trained and skilled staff at the treatment centre or cleansing station; and success of the treatment will be limited unless whole families attend. Our figures show that, irrespective of the size of the family, if scabies gains an entrance to the household 80% of the members are infected. In fact the household group is not a sufficiently large unit to aim at for attention; in many instances the "yard," "court," or block of houses should be the unit for examination.—I am, etc.,

JOHN R. GRAHAM,  
Medical Officer of Health, Chesterfield.

## Infective Hepatitis

SIR,—Dr. I. Gordon's excellent and comprehensive study of epidemic non-spirochaetal jaundice (Dec. 25, p. 807) raises again the problem of the nature of jaundice. The main difficulty is to decide whether we are to consider the ordinary case of jaundice, familiar to every practitioner, as a sporadic form of infective hepatitis or as a different type of jaundice with different aetiology.

Since Eppinger (*Die hepato-lienalen Erkrankungen*, Vienna, 1920) discovered for the first time inflammatory and degenerative changes in the liver of a young girl who committed suicide while suffering from "simple" jaundice, the view that simple "catarrhal" jaundice was due to a hepatitis has been generally accepted abroad, and Virchow's conception of jaundice as being caused by an obstruction due to a swelling of Vater's papilla or to the formation of a mucous plug in the common bile duct was more or less abandoned. Impaired galactose tolerance, which could frequently be demonstrated in such cases, favoured the assumption of a primary lesion of the liver parenchyma.

Hurst and Simpson (*Guy's Hosp. Rep.*, 1934, 84, 173), however, still maintained that true "catarrhal" jaundice was caused by an obstruction of the common bile duct, and could be differentiated clinically from jaundice produced by a "primary hepatic necrosis," a condition obviously identical with what is now commonly called hepatitis. Findlay (*J. R.A.M.C.*, 1940, 74, 72), though recognizing two different types, believes that differentiation on clinical grounds is not possible, and Dr. Gordon's series of cases proves that the clinical features of epidemic hepatitis may be indistinguishable from those of any other type of jaundice.

Although there is conclusive evidence of hepatitis in cases of so-called catarrhal jaundice, and though signs and symptoms of the latter condition and of infective hepatitis can be identical, it seems to be premature to regard every case of jaundice as a case of epidemic infective hepatitis before the causative agent has been discovered and can be demonstrated in every case of icterus. On the other hand, there is anatomical pathological evidence for the assumption that more than one factor plays a part in causing jaundice. A differentiation of cases of icterus can be made with the Takata reaction, especially by the modification which I described in 1936 (*Guy's Hosp. Rep.*, 86, 166) and which has been used successfully by many authors (cf. Ucko, *J. Lab. clin. Med.*, 1942, 28, 17). This very simple test gives negative results in the majority of cases of "simple" jaundice, and more or less strongly positive results in some cases without distinguishable clinical features. As the test indicates a disturbance of the protein metabolism in relation to the liver function, it can be concluded that this function of the liver is disturbed only in a certain number of cases of jaundice. The results of the test point therefore to the existence either of two different types of jaundice or of cases with and without impairment of the protein-regulating function of the liver. If employed more regularly, and possibly combined with other function tests and with biopsy experiments, it is likely to throw more light on the aetiology and the nature of icterus simplex.—I am, etc.,

London, W.1.

H. UCKO.

## Transportation of Fractured Femur

SIR,—The article by Lieut.-Col. Wood Power in the *Journal* of Oct. 23, 1943, was of great interest to all concerned with surgery in the forward area. He described and criticized a type of "Tobruk" plaster for fractured femur that has been largely superseded by a variation which doubtless my surgical colleagues will describe when further experience has enabled them correctly to assess its value. It has been used by many surgeons for the last 18 months, but not under the rigorous conditions described by Lieut.-Col. Wood Power. He had to rely on single-track railways for the evacuation of his casualties. Whether this improved "Tobruk" would have been successful but for that magnificent double-track railway that linked the Wadi Zemzen with Benghazi, or the all-electric line between El Hamma and Tripoli, is open to doubt.—I am, etc.,

R. BINNING,  
Major, R.A.M.C.

## Urine and Blood Urea under Sulphonamides

SIR,—I wish to record this case in order to emphasize the importance of quantitative analysis of the urine and blood urea estimation when sulphonamide drugs are given to patients on low diet.

A man aged 42 was admitted to the Royal Gwent Hospital suffering from a prepyloric ulcer of 20 years' standing, and for which he had undergone several courses of medical treatment. On Nov. 25, 1943, I performed a partial gastrectomy. He received two pints of plasma on his return to the ward and his condition appeared to be satisfactory. On Nov. 29 he complained of pain in the right side of his chest; his temperature was 101° F., and his leucocyte count was 13,000. An early pneumonia was suspected, and he was given four tablets of sulphathiazole, followed by two tablets every four hours with 1 drachm of sod. bicarb. His temperature returned to normal and there was no vomiting, but his general condition deteriorated. His fluid intake and urinary output were said to be satisfactory but were not measured.

On Dec. 2—i.e., seven days after the operation—I was told that his urinary output had ceased. He looked very ill, and his blood urea was found to be 312 mg. per 100 c.cm. He had received 29 tablets—i.e., 14½ g. of sulphathiazole. This was stopped immediately,

and he was given one pint of sod. sulph. 4.25% and two pints of 5% dextrose saline intravenously. This was followed by two pints of plasma and one pint of blood. During the course of the next few days his urinary output and blood urea returned to normal. He recovered, and has since been discharged from hospital.

In my opinion the kidney dysfunction was due to the administration of sulphathiazole when the patient was on low diet, and would probably have been avoided by the administration of more intravenous saline, etc.—I am, etc.,

Newport, Mon

J. T. RICE EDWARDS.

### Examining the Neurotic

SIR,—I trust these comments on the letter from Major Stungo and Captain Charlton (Dec. 25, p. 830), referring to the paper by Stephenson and Cameron, may be of interest.

It is important, particularly in dealing with large numbers of neurotics in a more or less summary fashion, to avoid being doctrinaire, and, with an open mind to the circumstances of each patient, to bring the force of all available facilities to bear on the condition. Physical investigation is one of the least time-consuming and most commonly available of psychotherapeutic facilities. Many patients have ideas about medical investigation and treatment, and that is one of the circumstances to be borne in mind. The dull and backward, for example, if they have not arrived at the stage of hopeless acceptance of symptoms, may have the desire for investigations, commonly attributed to pre-war Harley Street clientele, and with such a patient—who has, shall we say, had a head injury a year previously, with subsequent headaches, and who is anxious to have some investigations done—the most immediately effective measure may be to say to him, "All right, we will have your skull x-rayed in the morning." The would-be enlightened, on the other hand, may consider that psycho-analysis is what he stands in need of, and if we can say to him, "All right, we will have you psycho-analysed in the morning," I am sure it would be a great help. Avoidance of special physical investigations may be interpreted by one patient as a sign of confidence on the part of the psychiatrist, and by another as a continuation of the neglect to which he considers he has been for too long subjected. To undertake a physical investigation may be an indication that the psychiatrist is prepared to accommodate to the patient's attitude, and this reason I regard both as more effective and more scientific than the orthodox reason of physical examinations and investigations being done for the sake of impressing the patient.

In general, how a thing is done or not done may be more important to the neurotic than what is done or is not done, and there is room for differing practices in this field. It may be that the evils of over-investigations are on the wane and may not require much further emphasis. We are not so rich in effective therapeutic measures that we can ignore help from any quarter. The remark that "neurotic dyspepsia should be identified by means of positive psychiatric criteria and not by the negative findings of gastric investigations" is, I am sure, commonplace, but, in addition to the therapeutic value, physical investigations may also be helpful in assessing the degree of somatic dysfunction present and diagnosing or excluding conditions which commonly keep company with anxiety states but are best treated by other than psychological means, should there be sufficient indications that such a condition may be present.

With regard to dyspepsia, the prevalent assumption among medical men appears to be that there are many cases radiologically not showing ulcers which give indications of both a morbid mental attitude to alimentary functions and a disorder of these functions themselves, and if a psychiatrist is fortunate enough to have the help of a physician with experience in the diagnosis and perhaps in the treatment of these conditions along re-educative lines by dietetic means he should certainly take advantage of it, and whether the usual procedure of the patient being seen first by a physician is followed or not would seem to be a matter of administrative convenience and personal preference.

The report by Stephenson and Cameron of the typical course of anxiety states occurring in Service conditions, with the clear account of the three stages that these patients may pass through, is surely most valuable, and to describe the changing course of a neurotic illness is a contribution of more

special interest than would be indicated in the term "the reiteration of symptoms alone." I have no doubt that Stephenson and Cameron fully appreciate that if they were able, by choosing necessarily smaller groups, to give an account of very similar findings in the course of the illness, with personality findings showing striking similarities in the patients within each group, that would be still better, but the two factors which make that very difficult are the time-consuming nature of personality investigations, with the very unusual experience and skill required, and the great diversity of individual personalities. Even if patients are selected in whom similarities in personality make-up are to be expected—such as cases of conversion hysteria or effort syndrome—a psychiatrist, albeit gifted with some imagination, may search long enough before he finds two patients with strikingly similar personalities; and if you collect half a dozen that give that impression, the likelihood is that three or four may stand the test of expert investigation and the others be a bit weak in respect of their adherence to the standard personality of the group. A further difficulty is that people of very different personality make-up may react to stress in a superficially similar manner. I appreciate, however, that in patients of similar symptomatology some traits will be revealed with significant frequency on a personality assessment. I agree that the structure of the personality will be the diagnostic criterion of the future, and do not wish to fall into the same error as Stungo and Charlton in being over-critical of contributions of one sort in emphasizing the importance of an approach of complementary value.

One further point. Stungo and Charlton ask us "to correlate personality types with the relevant anxiety reaction," and in the course of their letter they give a result of their methods of such correlation in the composite assumption that dull, highly suggestible patients are prone to exhibit neurotic dyspepsia. But this assumption implies that they have satisfied themselves on a number of difficult points—e.g., that dull patients are uncommonly suggestible; that dull patients are uncommonly prone to neurotic dyspepsia; and that it is the more suggestible of the dull who are so prone. Further, if these patients have the general attribute of high suggestibility, why should their imitation of symptoms be permanent, as is suggested?—I am, etc.,

Dudley.

W. M. MCINTYRE.

### Inhaler for Trilene Analgesia

SIR,—Dr. W. Edwards (Dec. 18, p. 795) states that a trichlorethylene-air mixture is an excellent analgesic for childbirth, and he refers to the single bottle of Marrett's apparatus which he used for this purpose as "Martha, the mechanical midwife." I must point out that this apparatus is designed for employing trilene or ether for analgesia and anaesthesia, and, as such, it should only be used by qualified practitioners. The lever on the bottle can be moved to increase the strength of vapour admitted to the patient, and the bottle must be kept upright to prevent trilene from entering the air-tube.

It was because I was satisfied that trilene-air analgesia was superior to the nitrous oxide-air technique that, with the help of Mr. A. Charles King, I designed a special inhaler. This embodied modifications which, I believe, satisfy the requirements of inhalation analgesia for childbirth and permit it to be employed with safety by a midwife. The salient features of this inhaler are: (1) the strength of the mixture cannot be increased to anaesthetic potency; (2) the liquid cannot enter the air-tube; (3) the patient administers the mixture to herself; (4) the sound made by the movement of the valves enables the person in attendance to follow the behaviour of the patient without direct supervision of the administration. An account of this inhaler with the results of its use since Nov., 1942, was published in the *Lancet* of Dec. 4, 1943.—I am, etc.,

London, N.16.

A. FREEDMAN.

### Babies in Hospital

SIR,—I shall have to take the risk of being considered likely to hold very out-of-date views if I confess to nearly 30 years of medical work among infants in children's hospitals, child welfare clinics, and private practice, but two recent medical memoranda in the *Journal* have braced me to face the risk.

The memoranda to which I wish to draw attention appeared in the *Journal* of Dec. 25, 1943, and Jan. 8, 1944, under the titles "Suppurative Mastoiditis in an Infant" and "Staphylococcal Pyopneumothorax in an Infant: Recovery." Those two articles, which are deserving of careful study by all interested in the welfare of infants, to my mind show very clearly that hospital wards can be very dangerous places in which to treat infants, while they also show that, when babies have been brought to death's door, we have in modern treatment very efficient methods for life-saving.

In both cases, from the very full notes given, it appears to me that at the time the infant was admitted to the hospital ward there was nothing in the infant's medical condition to justify this step. Could not all the necessary investigations have been carried out in a well-run out-patient department? Are not the major catastrophes described—the suppurative mastoiditis and the staphylococcal pyopneumothorax—the direct result of hospitalization? Hospital ward work in the case of young infants is carried on under crippling handicaps. Do those most closely concerned always realize that these handicaps exist? Many child welfare medical officers and health visitors, dealing as they do with very large numbers of infants of all types and thereby gaining a wide experience, have come to dread the necessity for hospitalization when the need does arise.—I am, etc.,

Nailsworth.

MARGARET DUNSTAN.

### R.M.B.F. Christmas Gifts

SIR,—It is with great pleasure that I inform you that we were able to give £3 to each of our regular beneficiaries at Christmas, which amounted to £1,566, and in addition to distribute £2 on New Year's Day as "a special surprise" to 50 of our poorest folk, the total distribution of gifts being £1,666. These figures cannot reveal the amount of happiness and good cheer brought to 522 homes, but it can surely be imagined, and the gratitude of many is very touching. Please convey to your readers my heartfelt thanks for their most generous response and support of my appeal. I am deeply grateful to all.

Many may see from this Christmas gift distribution what great and useful work the Royal Medical Benevolent Fund is doing throughout each month of the year. Will those who do not already subscribe to our general funds not forget our work in 1944?—I am, etc.,

THOS. BARLOW,

1, Balliol House, Manor Fields, Putney, S.W.15. President, R.M.B.F.

## Obituary

JOHN ALLAN CRAIGIE MACEWEN, M.B., C.M., F.R.F.P.S.

Mr. John A. C. Macewen died at 3, Woodside Crescent, Glasgow, on Jan. 12. The eldest son of the late Sir William Macewen, he was educated at the University of Glasgow. He took the B.Sc. with honours in anatomy and physiology in 1895, the M.B., C.M. with honours in 1897, and jointly gained the Brunton Memorial Prize awarded to the most distinguished graduate of the year. After a period spent abroad, studying the operative procedures and surgical technique of some of the most distinguished surgeons on the Continent, he became house-physician to Sir Thomas McCall Anderson and house-surgeon to Sir William Macewen in the Western Infirmary, Glasgow.

At the outbreak of the South African War in 1900 Mr. Macewen volunteered for service with the armed Forces, and served as civil surgeon to the British Army in South Africa. On return to this country he threw himself whole-heartedly into the teaching of surgery, which was to become the outstanding feature of his professional career. For nearly a quarter of a century he acted as university assistant—first junior and later senior—to his father, the regius professor of surgery at the University and Western Infirmary, Glasgow.

He was also dispensary surgeon to the Glasgow Royal Infirmary, assistant surgeon to the Princess Louise Hospital, Roseneath, and surgeon to the Elder Hospital, Govan.

In the war of 1914-18 Mr. Macewen, in addition to his other duties, served, with the rank of captain, R.A.M.C.(T.), as surgeon in No. 4 General Hospital, Stobhill, Glasgow; consulting and operating surgeon to several Scottish Naval hospitals; and honorary consulting surgeon to the Princess Louise Scottish Hospital for Limbless Sailors and Soldiers, Erskine—tasks which occupied every hour of the day and often much of the night. During the German advance in 1918 Mr. Macewen was transferred to France, where he worked in the military hospitals at Etaples. He used to describe the ghastly results of enemy bombing of wards full of sick and wounded, which took place, nearly every night, necessitating the resumption of work in the operating theatres as soon as the raids were over to deal with the newly created casualties. The heroism displayed by the staff on those occasions, and particularly by the nurses, left an indelible impression on his memory.

In later years Mr. Macewen became surgeon and, before he retired, senior surgeon to the Royal Infirmary. In 1924 he was appointed professor of surgery at St. Mungo's College, Glasgow—a post which he only recently relinquished on account of failing health. During a long professional life of unremitting toil he gained in full measure the confidence and affection of those shrewdest of judges—his patients, his nurses, and his students. Few surgeons can have done more operative work and fewer still have taught so many students. He was one of the most successful teachers that the Glasgow School of Surgery has ever produced. When the B.M.A. held its Annual Meeting in 1922 in Glasgow, with his father as President of the Association, Mr. Macewen held office as hon. secretary of the Section of Surgery.

WALTER M. FALLON, M.D.

Walter Martin Fallon, M.D., professor of medicine in University College, Galway, and senior physician to the Galway Central Hospital, died on Nov. 9 after an illness lasting over six months. Although he died in the early forties his perception of the difficulties of others was exceptional, and his excellent advice for their solution was always highly prized by colleagues, friends, and patients. M. G. A. L. writes:

Prof. Fallon lived a full life, crowding into his short years experience in general practice in Birmingham, study in London and on the Continent, until he finally settled in Galway as a consultant. His student days were cast in the troubled times in Ireland, but despite his many activities his course was brilliant and he enhanced his friendship with many who were foremost in the National movement and developed advanced political views which he held until he died. He entered U.C.G. in 1915 as a medical student and thenceforward scholarships and other honours fell thick upon him: he graduated B.Sc. in 1919 with first-class honours, transferred to University College, Dublin, where he obtained the M.B., B.Ch., B.A.O. in 1921, and then back to Galway, where he received the D.P.H. with first-class honours in 1922. He obtained the M.D. in 1925, and returned to his beloved Galway in 1929 as medical superintendent at the Central Hospital, and two years later was appointed to the chair of medicine in U.C.G.

Few could have more friends than he had, and he was always accessible to them, and his interests were as wide and as varied as this circle. In his profession he always kept abreast of the times—often ahead of them; he could claim to be one of the first in the British Isles to treat Addison's disease on modern principles. The best proof of all of his ability was that his professional colleagues sought his opinion on themselves, their relatives, and their other cases, and always held it in very great esteem. Consulting work, however, did not entirely satisfy him; his great interest was in the realm of preventive medicine. Almost alone he took an active part in the proper hospital treatment of pulmonary tuberculosis in Galway, and behind the scenes he was active in crystallizing public opinion in the antituberculosis drive, and left his sick-bed to attend one of the first meetings of the campaign. But these are not the activities which will enshrine his memory. As his students carried his coffin to the grave, and his colleagues in academic robes followed after, there were many more who mourned his passing. Unspoken of and unknown but to a very few, his charity had earned their sorrow. Some of the really poor realized only too well that in the passing of Prof. Fallon his surreptitious payment of the weekly rent and his shy gifts of food had also ceased for ever.

We regret to announce the death on Nov. 23, 1943, at Walton-on-Thames of Dr. JOHN MACMILLAN, D.S.O., M.C., D.P.H., medical officer of health for Woolwich, at the age of 58. Dr. MacMillan was born in Glasgow and was educated at Glasgow High School before proceeding to Glasgow University. He graduated M.B., Ch.B. in 1908 and was for a short time in general practice before obtaining an appointment in the Glasgow Fever Service, after which he took up an engagement in London with the then Metropolitan Asylums Board. Before the last war he was senior assistant medical officer and school medical officer at Willesden. He joined the R.A.M.C., and became a lieutenant-colonel and officer commanding 5th Field Ambulance in France. His services won him the M.C. and D.S.O. and the esteem of those who served under him. He was appointed M.O.H. to the Metropolitan Borough of Woolwich in June, 1919, and from that time Dr. MacMillan devoted himself to building up the health services in Woolwich. He was particularly interested in building and organizing new health centres and clinics, slum clearance and rehousing, disinfection, and health propaganda. His reputation as an expert in disinfection was appreciated in England and on the Continent. Two years before the outbreak of war he turned his attention to air-raid precautions and with characteristic thoroughness trained personnel and organized the casualty services, so that when war broke out Woolwich was prepared. As a consequence of overwork and strain his health broke down at the end of 1940, and he was forced to take a complete rest from work. He returned to duty before he was fit, and again his health broke down early in 1943. Among the many offices Dr. MacMillan held were those of chairman of the Woolwich Division, British Medical Association (1924-5), honorary secretary of the Division (since 1931), chairman of the council of the Royal Sanitary Institute (from October, 1942), and chairman of the Central Council for Health Education (1938-9). In a tribute paid to him by the leader of the Woolwich Borough Council it was said: "Medical officers of health since 1870 have played a great part in improving the health of the country, decreasing the death rate, and adding to the average expectation of life. Many of them deserve to have their names on a Roll of Honour, and on such a roll Dr. MacMillan's name would have had a very high place."

Dr. JOHN PEERE WILLIAMS-FREEMAN, J.P., who has died at Thripton, near Andover, at the age of 85, had other claims to distinction beyond those of long service as a country general practitioner of real all-round excellence and of high principles and character. Educated at University College Hospital and at Newcastle-upon-Tyne, he became M.B. of Durham University in 1885 and M.D. in 1888; in 1886 he had qualified M.R.C.S. and L.S.A. Outside his professional work he made a name of great distinction for himself as an archaeologist—at Thripton he was in a district peculiarly rich in vestiges of ancient man. An indefatigable worker and walker, there was no nook or cranny of Hampshire which he had not personally explored on foot, and few if any in Wiltshire. His magnum opus was his *Introduction to Field Archaeology*, in which he first laid down the principles of the science and then illustrated them by a conscientious review of every single ancient monument in the entire County of Southampton. This work, published more than 30 years ago, was soon recognized as a classic, and is so greatly valued that it has been for several years extremely hard to come by a copy. Here and there fuller information or further excavations led the author to modify some of his conclusions, and it has been understood for some years that he had in preparation a new and revised edition. Probably the war has interrupted publication; for the sake of a host of his friends and of his fellow archaeologists it may be hoped that his labours may see the light when the war is over. For several years after retirement he lived at Botley, in Hampshire, but returned to Thripton and died there just a few days before Christmas. Dr. Williams-Freeman was an ardent member of the B.M.A., which he joined in 1887; and country doctors owed much to him for his indefatigable work on the Rural Practitioners Subcommittee of the Insurance Acts Committee between the years 1918 and 1926.

Surg. Lieut. J. Swift Joly writes: May I crave the space of your columns to add a few words to Dr. Cuthbert Duke's excellent obituary of my father, the late J. SWIFT JOLY. To the younger generation my father will be chiefly remembered for his informal teaching in the theatre and out-patient department at St. Peter's. Visitors of all sorts, from third-year students to postgraduates and practitioners of many years' standing, were encouraged to come in at out-patient sessions whenever they wished, and they never departed without learning something new. Thousands will remember his homely illustration of litholapaxy performed on a piece of chalk in the hollow of a student's hand. To those who took a quick peep through

a cystoscope he would say, "Take it yourself, look all round, find both ureters." His patience and courtesy to the ignorant and muddle-headed type of students were exemplary. Swift Joly had a great talent for inventing and improving instruments. His cystoscope and urethroscope are universally known and used. Many will also be familiar with his bladder retractor, needle-holder, and his connexion for use with Marion's suprapubic tube. He had a very wide knowledge of physics and chemistry and won the large gold medal for chemistry at Trinity College, Dublin. In his youth he was a noted cross-country runner and a keen fisherman. In the last ten years of his life he took up mountain climbing and ascended the Dent Blanche (14,300 ft.) at the age of 61. He was an enthusiastic photographer, and his collection of Alpine photographs has been considered by his friends to be as good as that of F. S. Smythe. He was also a keen Freemason and attained the dignity of London Rank many years ago.

The tragic death of Dr. BETTY GREGORY came as a great shock to her friends, many of whom saw her apparently fit and well on Christmas Eve and heard with amazement that, as a result of a massive pontine haemorrhage she died in her sleep a few hours later. Dr. Gregory graduated M.B., Ch.B. at the University of New Zealand in 1932. She was president of St. Margaret's Residential College for Women in Dunedin, took a prominent part in the social and sporting life of the University, won her blue in hockey, represented the University at lawn tennis, and was one of the best-known and most popular undergraduates of her time. After graduation she held resident posts in New Zealand and England before fulfilling her life-long ambition of working in India, where at first she worked under the Scots Mission at the Women's Hospital, Ajmere, and then went to the Lady Hardinge Medical College for Women at Delhi. On returning to England she held a resident post at the Oxford Eye Hospital, took her Diploma in Ophthalmology, and in more recent months has been working with the Oxford Nutritional Survey. She returned to Oxford a week before Christmas to await the arrival of her baby in February. Dr. Gregory will be much missed by that wide circle of friends in Australasia, India, and Great Britain who had learned to appreciate her great qualities.

By the recent passing of GARDINER WILLIAM TROUTON at the ripe age of 85 Rotherfield has lost an ideal general practitioner, for he possessed a fund of knowledge of humanity and the ailments it is heir to, their prevention and their treatment. Qualifying M.B., B.Ch. of Trinity College, Dublin, in 1888, and holding thereafter appointments, he took his degree of M.D. in 1894. Settling in Sussex, he soon won the respect and the affection of a very wide circle of patients and friends. His courtesy, his infinite care, and his fresh appreciative humour made him indeed a beloved and trusted physician for over thirty years before his retirement. He was chairman and the moving spirit of the Rotherfield Branch of the British Legion, for which post he was admirably fitted on account of his long association with the West Kent Yeomanry. Although over age in the last war, he served throughout the campaign in Egypt, and was present at Gallipoli, thereby securing the coveted Territorial Decoration. A staunch churchman, he was a churchwarden for many years, and gathered round him a following of keen men in the parish of Rotherfield. One of his children has followed her father as a medical practitioner.—W. McA. E.

Dr. JOHN CHRISTOPHER THOMSON, who died at his home in Edinburgh on Dec. 19, aged 80, was born and educated in Lockerbie and later studied arts and medicine at Edinburgh University. He held the following degrees and diplomas: M.A. 1884; M.B., C.M. with honours, 1888; M.D., 1892; D.P.H. Ed. and Glas., 1904; and D.T.M. & H. Camb., 1904. In 1888 Dr. Thomson went to Hong Kong to take charge of the Alice Memorial Hospital, London Missionary Society, when plague was raging in the Colony; he had gained such honour and affection from the leading Chinese that by their special request he was invited to join the Government Medical Service in order to organize measures against plague. From 1897 till his retirement, owing to ill-health, in 1909, he did valuable work in antiplague and antimalaria measures, in connexion with which he was twice mentioned in despatches. He held many public offices, among those of J.P., president of the Hong Kong Branch of the B.M.A., and hon. secretary of, and lecturer in, the Hong Kong College of Medicine. His work in connexion with the last brought him one of the most interesting contacts of a long and varied career, for he had as one of his students for three and a half years the great Chinese reformer, Dr. Sun Yat Sen, and as secretary of the College prepared the medical diploma which was presented to him in the City Hall by Sir William Robinson, the then Governor of the Colony. From his retirement in 1909 until 1923 Dr. Thomson was



engaged in public health work in this country. Among other things he acted as tuberculosis officer for the County of Dumfries and for the Borough of Fulham. Dr. Thomson's outstanding quality was the complete integrity of his mind and character. Inaccuracy of statement and unethical conduct were equally repugnant to him; he was a quiet man, of gentle and courteous manners, and possessed of unflinching tact, but his opinions were definite, and he could be entirely firm when occasion demanded it. His culture and intelligence were high, and it was an education and a pleasure to know him. He had an unusually harmonious family life, marred only by the premature deaths of his two daughters, Dr. Elsie and Dr. Ruby Thomson. He is survived by his son, Dr. Frank Thomson, Dundee, and by his widow, for whom the deepest sympathy is felt by their many friends.

## Medico-Legal

### ASSESSMENT OF BLOOD-GROUP EVIDENCE

Blood-group evidence can show in certain circumstances that a given man is not the father of a given child. An immense amount of work has been done on its scientific foundations, and in the hands of an expert it approximates as nearly to certainty as does any other kind of scientific evidence. On the whole, English courts have been quite ready to accept it when it has been available—in fact, some critics have complained that the experts have had too much of their own way. A case recently heard by Mr. Claud Mullins at the South-West London Police Court indicated the place which such evidence should properly take in our judicial system. The case was not the usual bastardy application, but a summons by a wife against her husband for maintenance. They had been married two or three years, but because each had a war job in different parts of the country they had never made a home together. The husband, however, visited her whenever possible. At the beginning of March, 1943, she bore a child. The husband expressed pleasure on hearing it was coming, and paid all the hospital fees. Two months later, however, he stopped sending her remittances, which had before then been regular, and denied paternity. His solicitors suggested a blood test; the wife, indignantly repudiating the suggestion of adultery, consented. Dr. David Harley, who tested the bloods, found that the husband's group was OM, the wife's AM, and the baby's AMN. Apparently the N factor must have come from another man. Dr. Harley's evidence was the husband's sole reason for opposing the wife's application; he produced no evidence of adultery and did not even name an adulterer, and his reason for disputing paternity never appeared. He was not allowed, under the rule in *Russell v. Russell* (1924) A.C. 687, to deny that he had had access to his wife at the material, or any, time. At first Mr. Mullins was inclined to think that,

albeit very reluctant, he was bound in law to accept the result of the blood test, not because as a man he thought the doctor's right but because as a magistrate he thought that the evidence was legally convincing. Moreover, he recalled that the Select Committee of the House of Lords had published in its report on Lord Merthyr's Bastardy (Blood Tests) Bill, 1939, some very dogmatic statements on the reliability of the test.<sup>1</sup> Later in the case, however, after the wife's sister, with whom she lived, had given evidence that the husband had visited the wife at the time when conception probably took place, and after the husband had been closely cross-examined, Mr. Mullins indicated that he was not prepared to bastardize the child on blood-group evidence alone. He did not, having heard and seen the wife, think she was of a type that commits adultery. The legal presumption that a child born in wedlock is legitimate is very strong, and he was not prepared to upset it solely on scientific evidence. The husband thereupon agreed to make a home for his wife, maintain her and the baby, and accept it as his child. Few who heard the decision doubted its wisdom. It would be an evil day for our courts if they ever felt obliged to elevate scientific evidence into a class by itself, instead of, as at present, keeping it on the same footing as other evidence.

<sup>1</sup> *British Medical Journal*, 1939, 2, 453.

## The Services

Major (temp. Lieut.-Col.) W. L. Brown has been awarded the D.S.O., and Capt. (temp. Major) M. E. M. Herford, M.B.E., M.C., R.A.M.C., a bar to the M.C. in recognition of gallant and distinguished services in Italy.

Major (temp. Lieut.-Col.) I. Fraser, O.B.E., R.A.M.C., has been awarded the D.S.O. in recognition of gallant and distinguished services in Sicily.

Temp. Surg. Lieut. W. B. Wallace, R.C.N.V.R., has been mentioned in dispatches for services in caring for the wounded in H.M.C.S. *Athabaskan* after his ship was attacked by aircraft.

### CASUALTIES IN THE MEDICAL SERVICES

*Missing, presumed to have lost his life.*—Temp. Surg. Lieut. A. D. Bone, D.S.C., R.N.V.R.

*Died from injuries received whilst attempting to reach British lines in Italy.*—Capt. E. T. M. Smith, R.A.M.C.

### DEATHS IN THE SERVICES

By the death on Dec. 24 at Bickington, Devon, of Major-Gen. Sir FOSTER REUSS NEWLAND, K.C.M.G., C.B., C.M.G., A.M.S.(ret.), the dwindling band of officers of the old Army Medical Service has lost a distinguished member a few days before reaching his 82nd birthday. His father was a doctor, and he was educated at Shrewsbury and Trinity College, Dublin, at the latter of which he took the M.B., B.Ch. degrees in 1885. He accepted a commission in the Army Medical Service in the following year, and went on service to India. He served throughout the South African War and won the Queen's medal with five clasps. In the war of 1914-18 he served in France up to 1917, when he went to Italy as D.M.S., and from 1918 to 1922 he held the same administrative rank in Egypt until his retirement in the latter year. He was mentioned in dispatches seven times during the last war, and for his various services he was successively awarded the C.M.G. in 1917, the C.B. in 1918, and the K.G.M.G. in 1919. Other distinctions included the honorary degree of M.D. of Trinity College, Dublin, in 1931; Commander of the Order of St. Maurice and St. Lazarus, Italy; Knight of Grace of the Order of the Hospital of St. John of Jerusalem in 1918; and Silver Medal "Al Milito della Sanita Publica," conferred on him by the King of Italy in 1912. In 1918 he married the daughter of an Italian general, by whom he had one daughter.

Major-Gen. GEORGE SOMERS McLOUGHLIN, C.M.G., D.S.O., R.A.M.C.(ret.), died on Dec. 27, 1943, aged 76. He took the M.B. Durham in 1888 and the B.S. in 1889, and entered the Army Medical Service in the following year. In 1897-98 he served in Uganda and was awarded the D.S.O. and the 3rd class Brilliant Star of Zanzibar, and in 1900-1 won the Queen's medal with four clasps in the South African War. His next active service was with the B.E.F. in France in the 1914-18 war, where he was A.D.M.S. to the Guards Division until 1917, when ill-health necessitated his return to England, and he was mentioned in dispatches and awarded the C.M.G. In 1922 he retired with the rank of major-general.

## Universities and Colleges

### UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.D.—Branch I (Medicine): L. P. R. Fourman, B. F. B. Russell, A. Wardale. Branch II (Pathology): R. M. Haines. Branch V (Hygiene): I. G. Davies.

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a quarterly meeting of the Council held on Jan. 13, with Sir Alfred Webb-Johnson, President, in the chair, a resolution of condolence was passed on the death of Dr. G. C. Anderson, Secretary of the British Medical Association. It was reported that Prof. G. Grey Turner had consented to deliver the Hunterian Oration for 1945. The Council agreed that the President should serve as an *ex officio* member of the Committee of Management of the Royal Medical Benevolent Fund. Diplomas of Membership were granted to B. Haigh, A. Taylor, and Margaret R. Todd.

\*Diplomas were granted, jointly with the Royal College of Physicians, as follows:

DIPLOMA IN PUBLIC HEALTH.—J. C. Boyle, Marjorie Swain.  
DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Elizabeth G. W. Barker, H. Coates, Esther A. Davidson, J. E. Glancy, R. Krambach, H. G. Miller, Margaret V. Saul, G. C. Toth.  
DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.—F. Bauer, G. A. Coggin, K. W. MacKenzie, P. C. Rushton, J. A. B. Thomas.

No. 52

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 1.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases. A blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever .. ..	73	—	30	7	4	95	5	18	2	6
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Diphtheria .. ..	578	32	111	90	35	939	50	219	95	40
Deaths .. ..	10	—	—	—	—	29	—	3	—	—
Dysentery .. ..	89	18	71	—	—	95	14	27	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	3	—	1	—	—	2	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	71	7	2	—	—	50	11	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	53	7	6	17	2	45	5	4	35	3
Measles .. ..	546	63	15	58	—	14,989	742	218	16	24
Deaths .. ..	1	—	—	—	—	4	1	23	—	—
Ophthalmia neonatorum .. ..	60	2	11	—	—	74	7	23	1	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	5	—	1	—	—	7	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,997	127	94	19	7	936	60	8	3	4
Deaths (from influenza) .. ..	464	56	23	10	5	44	5	3	—	—
Pneumonia, primary .. ..	—	99	535	22	21	—	43	179	25	7
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute .. ..	—	—	—	—	—	1	—	—	—	—
Deaths .. ..	6	—	—	1	—	4	—	2	7	1
Puerperal fever .. ..	—	—	3	17	1	—	8	15	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	150	7	19	—	3	165	13	1	2	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,029	148	256	26	76	2,159	141	287	70	61
Deaths .. ..	—	—	—	—	—	3	—	—	—	—
Smallpox .. ..	—	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	7	—	—	8	3	6	2	1	5	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,509	171	73	43	23	1,187	78	22	31	12
Deaths .. ..	14	4	9	2	—	14	2	1	2	—
Deaths (0-1 year) .. ..	459	58	80	46	22	409	50	48	64	38
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	6,904	1,134	781	295	176	5,119	784	553	272	155
Annual death rate (per 1,000 persons living) .. ..	—	—	—	—	—	—	—	—	—	—
Live births .. ..	5,886	788	869	346	288	6,131	775	786	379	302
Annual rate per 1,000 persons living .. ..	—	—	—	—	—	—	—	—	—	—
Stillbirths .. ..	181	16	35	—	—	234	25	30	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	—	—	—	—	—	—	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales the incidence of the common infectious diseases of childhood rose during the week: scarlet fever by 245, whooping-cough by 265, measles by 183, and diphtheria by 80. The notifications of acute pneumonia fell by 82.

In the great towns there were 464 deaths from influenza—that is, 226 fewer than in the preceding week. (For the week ending Jan. 8, influenza deaths numbered 255.) The largest numbers of deaths were recorded in London 56, Liverpool 22, Sheffield 19, Birmingham 16, Manchester 15.

The bigger numbers of cases of the common infections and the recent downward trend. Measles and whooping-cough had fallen in incidence continuously for the past six weeks and scarlet fever for the past four. Scarlet fever rose most steeply in Lancashire by 65 and in London by 61. The rise in whooping-cough occurred mainly in the south. London and the south-eastern counties having 155 cases more than last week. Measles was up in Lancashire by 48, in Hereford by 36, and in London by 31 cases. The increase in Hereford was due to an outbreak in Leominster and Wigmore R.D., with notifications going up from 2 to 35. The only increases of note for diphtheria were in Lancashire, 34 more, and in Warwickshire, 22 more cases.

The notifications of dysentery, 89, which were 7 fewer than in the preceding week, were the lowest for the past eight months. The chief centres of infection were Lancashire 20, and London 18.

In Scotland increases were recorded for diphtheria 37, and scarlet fever 14, while there were 57 fewer notifications of whooping-cough and 35 fewer of measles. There was a steep fall in influenza deaths in the 16 principal towns of Scotland: the totals for the past four weeks were 58, 52, 48, and 23.

In Eire notifications of measles rose from 28 to 58: Dublin C.B. 27, and Laoighis, Thomastown R.D., 20 notifications.

In Northern Ireland the relatively high incidence of diphtheria and scarlet fever was maintained: 46 of 76 cases of scarlet fever were notified in Belfast.

## Vital Statistics

Although the vital statistics of 1943 will not be available for some months, it may be of interest, with the completion of the fourth war year, to compare the trends of infectious diseases as recorded in the weekly returns of the Registrar-General.

## Notifications of Infectious Diseases in England and Wales

Disease	Average 1937-9	1940	1941	1942	1943
Diphtheria .. ..	58,500	46,683	51,091	42,318	35,944
Scarlet fever .. ..	91,158	65,573	69,111	84,932	116,217
Measles .. ..	407,905	495,507	285,803	374,198	371,189
Whooping-cough .. ..	51,403	171,406	65,563	95,859	59,859
Acute pneumonia .. ..	47,736	47,712	50,814	42,487	52,255
Cerebrospinal fever .. ..	1,319	12,791	11,119	6,089	3,380
Dysentery .. ..	3,413	2,643	6,597	7,177	7,772
Paratyphoid and typhoid .. ..	1,676	2,824	4,703	887	707

## Births and Deaths in the Great Towns of England and Wales

	1940	1941	1942	1943
NUMBER OF DEATHS				
All causes .. ..	307,544	267,683	231,579	247,968
Influenza .. ..	5,510	2,993	1,544	6,280
Paratyphoid and typhoid .. ..	56	79	38	26
Scarlet fever .. ..	80	58	55	69
Whooping-cough .. ..	356	1,205	468	605
Diphtheria .. ..	1,409	1,530	937	759
Measles .. ..	458	803	293	397
Diarrhoea and enteritis under 2 .. ..	1,812	1,947	2,283	2,569
DEATHS PER 1,000 CASES				
Paratyphoid and typhoid .. ..	44	31	111	101
Scarlet fever .. ..	2.5	2.1	1.3	1.2
Whooping-cough .. ..	14	16	14	12
Diphtheria .. ..	54	54	39	36
Measles .. ..	2.7	3.4	1.8	2.5
No. of live births .. ..	309,730	262,273	303,114	326,175
Deaths under 1 per 1,000 live births .. ..	62	70	58	58
Stillbirths per 1,000 total births .. ..	39	38	37	33

The declining trend of diphtheria is, perhaps, the most satisfactory feature of the returns, but it is evident that the campaign for immunization must still be vigorously prosecuted.

Cerebrospinal fever is gradually falling to its pre-war level. The small numbers of paratyphoid and typhoid fevers during the past two years are a matter for satisfaction, but the steady rise in the incidence of dysentery during the war is not. The origin of many of the outbreaks of dysentery has been traced to contaminated food. The notifications of scarlet fever during 1943 reached a very high level.

A comparison between years is made difficult by the changing population due to evacuation. The increase in the paratyphoid and typhoid case mortality was due to a relatively greater decrease in paratyphoid than in typhoid—that is, the smaller number of cases of these diseases in 1942 and 1943 contained a much higher proportion of typhoid fever than in 1940 or 1941. There has been a serious rise in childhood mortality from diarrhoea and enteritis. The case mortality of diphtheria shows a substantial improvement.

#### The Week Ending January 8

The returns of infectious diseases in England and Wales during the week included: scarlet fever 1,791, whooping-cough 793, diphtheria 661, measles 515, acute pneumonia 1,608, cerebrospinal fever 92, dysentery 165, paratyphoid 4, typhoid 4, influenza deaths in the great towns numbered 255.

## Medical News

More than two thousand British and Allied doctors and surgeons and members of hospital staffs are being invited to see the British Council film, "Surgery in Chest Diseases," at the Philharmonic Hall, Liverpool, on Thursday, Jan. 27, at 4.30 p.m. Doctors and members of hospital staffs requiring tickets should communicate with the Liverpool Medical Institution or the British Council, 1, Basnett Street, Liverpool, 1.

A meeting of the Council of the Medical Superintendents' Society will be held at the Midland Hotel, Derby, on Saturday, Jan. 29, at 3.30 p.m., and Sunday, Jan. 30, at 10 a.m.

A series of lectures on psychology, suitable for a Diploma in Psychological Medicine, will be held at the Maudsley Hospital, Denmark Hill, S.E.5, on Mondays, Wednesdays, and Fridays, from 2 to 4 p.m., beginning on Jan. 31 and ending on Feb. 21. The fee for the course is £3 3s., payable at the time of enrolment on Jan. 31. All inquiries should be addressed to Dr. W. W. Kay, acting hon. director of the Maudsley Hospital Medical School, Central Pathological Laboratory, West Park Hospital, Epsom. (Tel. Epsom 1408.)

As announced on Jan. 8 (p. 67) the next special film session for doctors and allied personnel will be held at the Odeon Theatre, Broadmead, Bristol, on Sunday, Feb. 6, at 10.45 a.m. An additional film to be shown is the British Council film "Surgery in Chest Diseases."

The Royal Institute of Public Health and Hygiene has arranged a series of lectures on "The Public Health" to be given at 28, Portland Place, W., on Wednesdays, Feb. 9 to March 29, at 3.30 p.m. Admission is free and applications for seats should be made to the secretary.

The Society of Thoracic Surgeons of Great Britain and Ireland will hold a meeting at the Royal Society of Medicine, 1, Wimpole Street, London, W., on Thursday, Feb. 10. At 9.30 a.m. the subject for discussion will be carcinoma of the oesophagus, and at 2 p.m. the subject will be lung abscess. Visitors of the British, Dominions, and Allied medical services, and general surgeons of the E.M.S., will be welcome after obtaining permission from their own higher authorities.

A refresher course in tuberculosis for tuberculosis officers and medical practitioners will be held in Liverpool on Monday, March 27, to Friday, March 31, inclusive. It is being arranged by the committee on education of the Joint Tuberculosis Council and National Association for the Prevention of Tuberculosis, in collaboration with the City Public Health Department and the University of Liverpool. Details of lecturers and subjects will be announced later. The fee for the course is £4 4s., payable in advance. Early application should be made to Dr. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, from whom all information may be obtained.

The name of Dr. George Paterson Burr appears in a list of names published by the *London Gazette* as commended for brave conduct when their ships encountered enemy ships, aircraft, submarines, or mines.

There will be found in our advertisement columns this week an advertisement for the post of temporary Assistant Secretary of the British Medical Association.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, *BRITISH MEDICAL JOURNAL*, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

Authors desiring REPRINTS should communicate with the Secretary of the Journal Board, B.M.A. House, Tavistock Square, W.C.1; on receipt of proofs. Authors over-seas should indicate on MSS. If reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Members' subscriptions should be sent to the Secretary of the Association.

TELEPHONE NO.—B.M.A. and B.M.J.: EUSTON 2111.

TELEGRAPHIC ADDRESSES.—EDITOR, *Atiology Westcent*, London; SECRETARY, *Medicera Westcent*, London. ADVERTISEMENTS, *Articulate Westcent*, London.

B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.

### ANY QUESTIONS?

#### Some Unqualified Practitioners

Q.—I should appreciate a short statement as to the differences between, and the beliefs forming the basis of, the following forms of unqualified practice: (a) osteopathy, (b) chiropractic, (c) manipulative surgery, (d) bone-setting.

A.—Osteopathy and chiropractic are both complete systems of "medicine." In osteopathy the theory is that the structural integrity of the mechanism of the body is the most important single factor in maintaining health, and consequently that structural derangement is the predisposing cause of disease. Any tissue may be perverted, but owing to the intimate relationship of the spinal column to the nerves and the vascular system this is the region most often under suspicion. Investigation of what by this "philosophy" are considered to be secondary effects—e.g., chemical, microscopical, bacteriological changes, etc.—follows orthodox lines, but treatment is essentially manipulative to the allegedly perverted or displaced structure. The founder of osteopathy was an orthodox practitioner, Dr. Still of Kansas, and the first school of osteopathy was opened in 1892.

In chiropractic the emphasis falls upon displacements of the vertebrae, which produce pressure effects upon the nerves, and so interfere with the "nerve force" which should flow freely from the brain to the rest of the body if health is to be maintained. Any peripheral effects are thus secondary to the interference with the nervous outflow. The displacements are usually detected by palpation of the spine; the replacement is also manual.

Both osteopathy and chiropractic are much more extensively practised in the U.S.A. than in this country, and in most of the States both are recognized and regulated by law. Their relative numbers and growth are illustrated by the following figures:

Osteopaths (world)	1921: 7,000; 1925: 9,000	} graduates of recognized schools
Chiropractors (U.S.A.)	1921: 10,000; 1926: 25,000	

Manipulative surgery is that form of treatment by manipulation for various local lesions practised by orthodox surgeons—it is indeed doubtful if an unqualified person can legally call himself a manipulative surgeon. No general philosophy of disease as a whole enters into the application of this form of corrective treatment.

Bone-setting is a loose term which defies definition. An orthodox orthopaedic surgeon is obviously often a bone-setter in the truest sense, but the term is usually applied to an unqualified practitioner who claims to cure certain painful and disabling manifestations, usually in joints or muscles, by varying forms of manipulation and adjustment, most of which he regards as secret and peculiar to himself and his fellows. Concisely, a bone-setter is an unqualified manipulator, who may or may not know something of the underlying pathology, physiology, and anatomy of the condition which he treats. The manipulations are usually standardized for each individual joint or region, and, in order to avoid possible legal penalties for damage done, many of the better-known practitioners refuse to treat any case which shows definite physical signs—e.g., x-ray changes, etc.—of organic disease.

#### Control of Tuberculous Patients

Q.—(1) Can any control be exercised over the place of residence of people suffering from tuberculosis of the lung? (2) For example, can such patients live in residential flats? (3) Are they kept under any supervision as to infectivity?

A.—The general powers of local authorities, and the obligations imposed on infectious persons for preventing the spread of infection, contained in the Public Health Act, 1936, apply only in the case of sufferers from the diseases mentioned in that Act and from any diseases to which these powers and obligations are extended by

Orders or Regulations. These powers and obligations are not included in the Regulations under which tuberculosis has to be notified, but which make it the duty of the medical officer of health to "make such inquiries and take such steps as are necessary or desirable for investigating the source of infection, for preventing the spread of infection, and for removing conditions favourable to infection." It will be noted that no obligation is placed on the infectious person himself, and as the M.O.H. is instructed by the Regulations that every notification of tuberculosis and every document relating thereto are to be regarded as confidential, it is obvious that restrictive measures involving exposure of their state are not intended to be applied to patients. Certain sections of the Public Health Act may, however, be applied compulsorily. A local authority may enforce periodical disinfection of houses, rooms, and articles for any infectious disease, including tuberculosis. An L.A. may also apply to a court for an order for the compulsory removal to hospital of an open, demonstrably infectious case of pulmonary tuberculosis if precautions against the spread of infection are not or cannot be taken, if other persons are therefore at risk, and if there is accommodation available for the patient in an institution. This procedure has generally been regarded as unworkable under present conditions, especially with the shortage of beds for even those infectious cases desiring admission, and has never, or practically never, been used.

The answers to the questions are therefore (1) virtually none; (2) yes; (3) they are visited by tuberculosis visitors who advise and assist them in maintaining their own health and preventing the spread of infection to others. If the M.O.H. learns from any source that the habits of an infectious person are specially dangerous to others he will no doubt instruct the visitors to put pressure on the patient to behave more hygienically; perhaps, in cases of gross negligence, reinforcing the admonition by a threat that the above-mentioned power of removal will be used.

#### Vitamin D in Arthritis

Q.—I understand that large doses of vitamin D have been used with alleged success in the treatment of osteo-arthritis. Is there any satisfactory evidence that it is of use in this or in any rheumatic conditions, and, if so, in what doses should it be prescribed?

A.—There is no satisfactory evidence that vitamin D is of any service in osteo-arthritis, and since its action tends to improve calcium assimilation and thus to lead to increased bone density, it would appear to be contraindicated unless senile osteoporosis is the dominant feature rather than the hypertrophic changes and increased bone density of true osteo-arthritis. Reed, Struck, and Steck (*Vitamin D*, Chicago, 1939) treated a mixed group of arthritides with huge doses of vitamin D, 150,000 to 200,000 international units daily, and noted measurable improvement in 74.5%. They do not state in which type of arthritis this occurred, but of the 45 cases only 7 were of the hypertrophic type, and it seems probable that the improvement was in the other types. The use of vitamin D in rheumatoid arthritis in which atrophic changes and osteoporosis are features is a sound therapeutic measure in moderate dosage, 400 to 600 i.u. daily. A popular journal has recently reported remarkable beneficial effects in America from the use of a special form of vitamin D which is prepared by passing a current of electricity through ergosterol instead of irradiation with ultra-violet rays; with this method the toxic effects liable to result from heavy dosage of the vitamin are said not to occur; the benefit was in rheumatoid arthritis and not in osteo-arthritis. I am unaware of any confirmation of these results up to the present.

#### Inheritance of Diabetes

Q.—A youth of 18, in good general condition and free from symptoms, has been put in Grade 4 by a medical board because of diabetes. He has been advised to take a high-carbohydrate diet with zinc-protamine-insulin daily. His sister, aged 12, is a diabetic and has been on insulin for some time past. He hopes to marry, and asks: (a) Would his wife's prospects of happiness in marriage be affected by his having diabetes? (b) Are his chances of begetting children affected? (c) Is he likely to transmit to his children a tendency to the disease?

A.—In *The Diabetic Life* (J. and A. Churchill, 12th edition, 1941, p. 125) R. D. Lawrence writes: "Formerly, in severe diabetes, men were usually impotent and women ceased to menstruate, but insulin usually restores a normal sexual life. Marriage is not dangerous to men, but if a family history is present, full family histories on both sides should be got, the hereditary nature of the case must be considered, and the possibility of the child developing diabetes. . . . When the doctor has pointed out the hereditary possibilities after a full pedigree on both sides has been studied, the parents must take the responsibility of decision, as there are no laws of national eugenics, nor, indeed, any certain laws of diabetic heredity." Some of the factors affecting happiness in marriage would be the reduced expectation of life (intercurrent diseases, such as tuberculosis) and

the trouble of providing suitable diet. The risk of invalidism should not be great. The case would be affected by the economic circumstances and intelligence of the patient. An intelligent man in a good social position might make a success of it, but a dull man in a poor home would be a different matter. As the quotation from *The Diabetic Life* suggests, the chances of begetting children are probably unaffected.

Diabetes, or at least the tendency to develop it, is certainly inherited. As yet, however, there is no general agreement as to the mode of transmission, and in any case it is probable that only some of the bearers of the gene or genes develop the condition—i.e., the co-operation of other factors is necessary if the condition is to become manifest. It would probably be generally agreed that the chance of any particular child being affected is not greater than 1 in 10, and may be considerably less.

#### Hodgkin's Disease and Leukaemia

Q.—Could you inform me of the latest treatment for Hodgkin's disease and leukaemia?

A.—The chief place in the treatment of Hodgkin's disease and of leukaemia is taken by x-ray therapy directed towards the relief of symptoms and the prolongation of life; supporting measures, including iron, arsenic, and ascorbic acid, should not be neglected. Expert pathological diagnosis is essential in Hodgkin's disease, as this term is often used to include not only lymphadenoma verum, but all the lymphadenopathies, from the benign lymphoid follicular reticulosis (which seldom requires x-ray therapy) to the very malignant reticulo-sarcoma (which requires the most intensive x-ray therapy). In an early case of lymphadenopathy, where the involvement is limited to a single group of superficial lymph nodes, excision preceded and followed by a relatively large dose of radiation may result in cure—or at all events disappearance of the disease for a long period. At the other extreme, with generalized disease, the prospect of worth-while palliation need seldom be abandoned.

In splenic irradiation for chronic leukaemia the longest remissions will be obtained if the white cell count is brought down to 6,000 per c.mm.; the practice of stopping x-ray treatment when this comes down to about 20,000 should be condemned. Many cases of chronic lymphatic leukaemia are symptom-free, and do not need irradiation simply because there is an increased lymphocyte count. All cases of chronic myeloid leukaemia require irradiation when the myelocyte count begins to show a progressive increase.

Radio-active phosphorus (by mouth or by injection) gives results in leukaemia similar to those of x-ray therapy, but supplies are not available in this country, as our cyclotrons are engaged on war-work (see *Radiology*, 1942, 39, 573, for American results).

#### Spina Bifida and Incontinence

Q.—A boy aged 8 suffers from permanent incontinence of urine and faeces following nerve damage during an operation for a spina bifida and meningocele of the lumbar region associated with hydrocephalus. Would this boy's condition be improved if the ureters were transplanted into the colon and a permanent colostomy performed?

A.—The effect of transplanting the ureters would be to render the control of the outflow of urine more difficult than ever, and to increase the risk of pyelitis. The permanent colostomy would add a further nursing difficulty without improving the rectal condition, since urine would pass more freely to the anus than to the colostomy opening. Regular wash-outs should control the rectal incontinence by keeping the lower bowel empty. The urinary incontinence can be managed by means of an apparatus to collect the urine, either with or without a suprapubic cystostomy.

#### Anaesthesia for Cystoscopy

Q.—Is pentothal sodium a suitable anaesthetic for use (a) during cystoscopic examination of tuberculous bladders, (b) for over-distension of the bladder, (c) for cystoscopic examination in patients who have a cough from any cause? In the first two types of case I have failed to obtain complete immobility and absolute relaxation; in type (c) cough is liable to occur, and I am under the impression that it cannot be suppressed. I may add that I am using a 2½% solution in out-patients who are unpremedicated.

A.—Pentothal (or the other ultra-short-acting barbiturate, hexobarbitone) if given in sufficient quantity will provide satisfactory anaesthesia for cystoscopy in the medical conditions described. Whether or not it is suitable for out-patients depends on how long the patient is to be kept anaesthetized, and this in turn is associated with the dexterity of the surgeon and his being ready to introduce the cystoscope immediately anaesthesia is induced. These factors decide the amount of pentothal which will be used, and this determines the time taken by the patient before he is ambulatory. Moderately deep anaesthesia is needed to relax the sphincter of the bladder and to prevent the patient reacting to the stimulus of the cystoscope. Deep anaesthesia need be of only extremely short

duration—the actual time for the introduction of the cystoscope into the bladder—and is obtained by the rapid injection of a small quantity of pentothal, say, 0.3 to 0.4 g. The syringe and needle are kept *in situ*, and once the cystoscope is inserted only enough additional pentothal is given to keep the patient quiet. However, if more than half a gramme is used, as is likely if it is given slowly to unpremedicated out-patients with irritable bladders, the recovery time will probably be prolonged enough to put its use for out-patients out of court.

On the whole pentothal should be used for out-patients *only if it is given in a small dose rapidly*. This provides a short period of deep anaesthesia, but, even after this, adequate facilities for recovery must be afforded.

#### Hormones and Cancer

**Q.**—As stilboestrol is apparently used with success for the treatment of prostatic carcinoma, is there any evidence that the prolonged administration of testosterone propionate may be useful in cases of cancer of the breast or of the uterus?

**A.**—I cannot see the analogy between treating carcinoma of the prostate with stilboestrol and treating carcinoma of the breast with testosterone propionate. Unfortunately it is possible to find articles and letters in the literature describing isolated cases treated apparently successfully with every hormone preparation known. There is no incontrovertible evidence that testosterone propionate is of any value in the treatment of carcinoma of the breast.

### INCOME TAX

#### Partnership—Expenses of New Partner

"LAMBDA" joined a partnership on Jan. 1, 1943, in replacement of a partner who left the practice on Sept. 30. "Each partner claims his own expenses." The inspector of taxes has agreed to allow "Lambda" the expenses of the outgoing partner for the previous year, but in fact these expenses cover a period of nine months only.

\* The root difficulty here is that a partnership is assessable to tax for any year in one sum on the amount of the *profits of the firm* for the previous year. In arriving at that amount the expenses deducted can reflect only nine months' expenses of the outgoing partner, though if a locumtenent was employed by the firm in the interval of three months that expense is also deductible. Consequently what is really the only way by which "Lambda" can have the equitable arrangement he desires—i.e., the allowance of a year's expenses from his share of the gross receipts—is by some re-allocation of the gross receipts among the partners themselves.

#### Diploma Expenses

R. H. incurred expenses in taking a special examination. Can they be regarded as deductible in calculating practice profits?

\* No. There are two grounds of objection: (1) that such expenses are personal and not incurred in the carrying on of professional work, and (2) even if that were not the case such expense is of a capital nature, as improving the knowledge of the practitioner.

### LETTERS, NOTES, ETC.

#### Parotitis following Trilene

Dr. F. G. PATRICK writes: Recent correspondence concerning trigeminal paralysis caused by trilene anaesthesia prompts me to inquire whether any anaesthetist has noticed swelling of the parotid glands following its use. Some months ago I gave an anaesthetic consisting of nitrous oxide, oxygen, and trilene to a boy of 9 for the removal of a leg plaster. The anaesthetic lasted about 15 minutes, and the child's recovery was uneventful, but about half an hour afterwards his neck became swollen and painful. When I saw him some 3 hours later he had the typical appearance of a child with mumps. The swelling, which was painful and tender, gradually subsided during the next 24 hours. I have found reference in the literature to bilateral parotitis following anaesthetics, but it has been attributed to the atropine premedication. This patient had no atropine previously, so I can only conclude the anaesthetic itself was responsible for his parotitis.

#### When the Stethoscope should be left in the Bag

Dr. G. H. GRANT DAVIE writes: I have just recovered from acute bronchiolitis. This was accompanied by frequent irritating coughs induced by bronchial and tracheal gurglings, profuse frothy, sticky, mucopurulent spit, with a maximum temperature of 102°, and, what is not so often described, the presence of an uncomfortable dull rending intrapulmonary pain as though the lung was being slowly torn apart. This reached a maximum sharp cutting type of pain when intrapulmonary pressure was raised by coughing or nose-

blowing. Under treatment, in two to three days the acute symptoms lessen, temperature and pulse rate drop, respirations are less hurried and difficult, the pulmonary pain becomes more bearable, or perhaps is only apparent on intrapulmonary effort. These diminishing physical signs and symptoms should amply satisfy the physician in charge. But what is the procedure? Out comes the stethoscope, and the patient is put through a meticulous auscultatory examination involving inspiratory and expiratory effort over an appreciable period, at the end of which he is more or less panting, with increased cardiac rate, and shortly afterwards there is a return of the sickening intrapulmonary pain with increased exudation and cough. Thus physicians ignore the first principle of their teaching that an inflamed part should be kept at rest, and unwittingly cause their patients, who in turn do their best to help, the great disservice of compelling resolving bronchioles to work at pressure. Their clinical sense should tell them that all is well, and that the less disturbance these inflamed surfaces receive the sooner repair will take place, and, what is quite important, the comfort of their patients will be enhanced.

#### Rare Medical Books

There are several rarities to be sold at Messrs. Sotheby's auction room on Jan. 24-6, derived from a number of different collections. Interesting incunabula are the first edition, Bologna, 1487, of Savonarola's *De pulsibus urinis et egestionibus*; and a *Hortus Sanitatis*, Strasburg, 1497. There is a translation by William Ward of Alexis of Piedmont's textbook of diseases, 1595; and two London editions of Th. Barrough's *Method of Physick*, respectively 1590 and 1596. Earlier than these (London, 1552) is a slightly imperfect copy of the textbook of anatomy by Thomas Geminus: more covetable, perhaps, is the Southwark-printed, 1525, *Noble Experience of the Virtuosis Handywarke of Surgery*, whose author was Hieronymus von Braunschweig; and even rarer is a pharmacological treatise by the same author from the same press in 1530. The state of medicine and surgery in England and in France is compared by G. Arnaud in some memoirs, printed 1768, next to which may be mentioned Despierre's monograph on the diseases of sailors, Paris, 1767, and Rostinio's work on venereal disease; Venice, 1556; also from Venice, though not from the same printer, is Susio on fevers and bleeding, 1571. There are two books on preventive medicine by Traffichetti, 1565, and Fonseca, 1602; and in the same category, perhaps, can be placed Philip Moore's *Hope of Health, wherein is contained a goodlie reglemente of life*, London, 1564. This Moore was better known as an almanac producer and prognosticator, though whether he was the original Old Moore is not here affirmed. Among others of lesser interest one may just note two manuscripts. One is interleaved with the seventh edition, 1631, of the *Rieh Storehouse or Treasure for the Diseased*, by G. W. These leaves contain many prescriptions with the names of the seventeenth-century physicians responsible for them. The other is Richard Henshall's *New System of Health*, never published; it was composed in 1728 and dedicated to Drs. Henry Hall, Robert Bostock, and Richard Breech.

#### Resuscitation by Rocking for Heat-stroke

Dr. F. R. W. K. ALLEN writes from Poona: I have been following with interest the various modifications of stretchers for applying Eve's method of resuscitation culminating in the illustration on page 494 of your issue of Oct. 16, 1943. In case of heat hyperpyrexia there is always a danger of failure of respiration. If such cases are treated by Eve's method of resuscitation there will be no need for any interruption in the measures being taken for reduction of the temperature. Both can be carried out simultaneously. It appears that all "heat-stroke stations" should be supplied with a rocking device. I have not met with any support here, and so I should be grateful for your readers' criticism on the subject.

#### Delayed Menarche

Dr. E. FRIEDMANN writes from the Royal Free Hospital: Though it is quite true that the menarche delayed beyond the 16th birthday is not an abnormality in itself, nor does it necessarily cause trouble, there is, however, one important point that needs special emphasis. The girl may be physically well developed and show no signs of endocrine immaturity as the absence of the menstruation might suggest. But from the experience of hundreds of cases of sterility we know that there must be a definite relationship between the onset of the menarche and infertility. Quite a number of patients attending a sterility clinic are those who did not menstruate until the age of 17 or 18, although from then on they had no gross menstrual irregularity. If we consider the katamenia from this important point of view, I should think that a girl who has not started to menstruate by the age of 16 at the latest should be treated with thyroid, oestrogen, and vitamins in an attempt to prevent the development of a hypoplastic uterus. The great urgency of the social problem of infertility should stimulate us to prevent rather than to cure any condition liable to lead to sterility.



# BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 29 1944

## LOCALIZED SUBCUTANEOUS OEDEMA WITH WEAKNESS OF LIMB MUSCLES A SYNDROME DUE TO POLYARTERITIS NODOSA

BY

RONALD MacKEITH, D.M., M.R.C.P.

*Temporary Surgeon Lieutenant, R.N.V.R.; Medical Specialist, Royal Naval Medical Service*

The three cases of polyarteritis nodosa described here are of interest for several reasons. They all showed as the two salient features a localized soft pitting oedema of the skin of one or more limbs together with asymmetrical muscular weakness—a clinical picture not previously described. Two of these patients recovered from the illness. All three cases were diagnosed in life, the diagnosis being confirmed by biopsy. The three cases were seen in one hospital in a period of 18 months, which suggests that Leishman (1937) was right in suggesting that this disease, though very varied in its forms, should be recognized more frequently. It may be observed that during his period, although polyarteritis was being looked for, in only one other case was it suspected, and this showed a clinical picture very similar to that of the three cases. The biopsies, however, were negative.

### Case I (an Engineer aged 27)

The family history was irrelevant. There was a previous history of a cough for 12 months and of a coryza towards the end of April, 1940. On May 1, 1940, while at work, the patient injured his right calf and had to take to bed. Two days later, while in bed, he found that he had great difficulty in moving the right thigh—attempts causing pain in the groin—and that he was unable to lift his right forearm off the bed or to raise the arm at the shoulder.

On May 6, 1940, he was admitted to St. James Hospital, London. He was of slim build and in fair general condition; his temperature was 99.6° F., the pulse rate 88, and the respiration rate 24. No abnormal signs were found in mouth, lungs, heart, or abdomen; his blood pressure was 135/85 (a week later it was 120/80). A mild degree of clubbing of the finger-nails was present. There was considerable weakness of the right deltoid and biceps muscles, which were tender on palpation. The right upper arm was swollen—the circumference being 9½ in., against 8 in. on the left side—from diffuse soft pitting oedema. The skin was not inflamed. There was no sensory loss or any paraesthesiae at this time or later. The muscles of the right thigh were weak and tender, and pain was felt on externally rotating the flexed thigh. There were two subcutaneous nodules on the outer side of the right calf, but no oedema there. His left arm and leg were normal. The patient was treated by rest in bed and a high vitamin diet (with bexmax, cod-liver oil, ascorbic acid, and iron), and massage at a later stage.

**Investigation on Admission.**—Urine, nothing abnormal. Blood urea, 36 mg. per 100 c.cm. Blood count: R.B.C. 5.5 millions; Hb 92% (Haldane); platelets normal; W.B.C. 12,000—neutrophils 9%, lymphocytes 15%, monocytes 6%. (Nine days later: Hb 97%, W.B.C. 12,000, neutrophils 69%.) Sedimentation rate, normal. Sputum: no tubercle bacilli on 3 examinations; culture pneumococci. Radiograph of chest (May 13, 1940): Increased markings at both bases, and a small amount of fluid or thickened pleura at the left base. (A further chest radiograph two weeks later showed no change.) A radiograph of the right upper arm revealed no abnormality. Cerebrospinal fluid: Clear, colourless, 2 cells per c.mm.;

protein, 40 mg.; globulin nil; chlorides, 740 mg.; W.R. and Lange negative. Blood W.R. and K.R. negative. An electrocardiogram on May 26 showed poor T-waves and slight elevation of ST, with depression of ST<sub>1</sub>. These changes were still present 10 days later.

**Progress in Hospital.**—For 2½ weeks he had a symptomless pyrexia and a rather longer-lasting tachycardia (Fig. 1). The swelling of

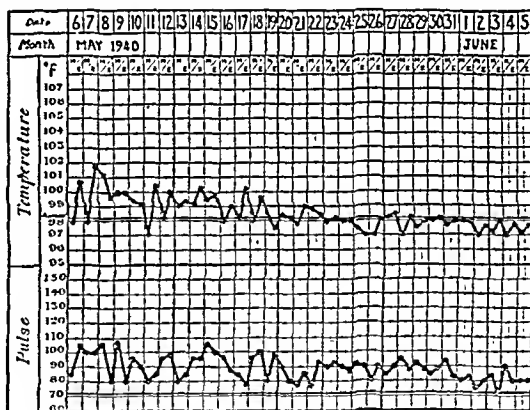


FIG. 1.—Temperature and pulse chart of Case I.

the right arm had increased the day after admission to 10½ in. circumference, but in a few days it began to diminish and in two weeks it was gone. The weakness of the right arm and shoulder persisted for 10 days before improving, but had cleared up in 4 weeks. A week after admission there was still tenderness at the insertion of the biceps muscle, and some pain was felt on using the triceps. There was also a tender nodule, about 0.5 cm. in diameter, beside the brachial artery at the level of the biceps tendon. The power of the right thigh improved from the time of admission. A week after admission one small tender subcutaneous nodule was observed on the outer side of the right calf, and also an erythema-nodosum-like lesion of the skin over the shin. On May 11 he complained of pain in the left orbit, but no lesion or oedema was seen. The patient started getting up on June 3, and for a few days after this the dorsum of the right foot showed a little soft oedema. There was no tenderness or weakness of muscles of the legs, and the ankle-jerks were present though not brisk. On June 9, five weeks after admission, he left the hospital quite well.

On May 22 a biopsy specimen was taken of a nodule, 0.3 cm. in diameter, attached to a small subcutaneous vessel in the right arm. The histological report was: "Polyarteritis nodosa in nodule from subcutaneous tissue of arm."

Two and a half years later, in Oct., 1942, he and his private doctor both reported that he had remained perfectly well.

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#### Partnership.—Expenses of New Partner

"LAMBDA" joined a partnership on Jan. 1, 1943, in replacement of a partner who left the practice on Sept. 30. "Each partner claims his own expenses." The inspector of taxes has agreed to allow "Lambda" the expenses of the outgoing partner for the previous year, but in fact these expenses cover a period of nine months only.

\* The root difficulty here is that a partnership is assessable to tax for any year in one sum on the amount of the *profits of the firm* for the previous year. In arriving at that amount the expenses deducted can reflect only nine months' expenses of the outgoing partner, though if a locumtenent was employed by the firm in the interval of three months that expense is also deductible. Consequently what is really the only way by which "Lambda" can have the equitable arrangement he desires—i.e., the allowance of a year's expenses from his share of the gross receipts—is by some re-allocation of the gross receipts among the partners themselves.

#### Diploma Expenses

R. H. incurred expenses in taking a special examination. Can they be regarded as deductible in calculating practice profits?

\* No. There are two grounds of objection: (1) that such expenses are personal and not incurred in the carrying on of professional work, and (2) even if that were not the case such expense is of a capital nature, as improving the knowledge of the practitioner.

### LETTERS, NOTES, ETC.

#### Parotitis following Trilene

Dr F. G. PATTRICK writes: Recent correspondence concerning trigeminal paralysis caused by trilene anaesthesia prompts me to inquire whether any anaesthetist has noticed swelling of the parotid glands following its use. Some months ago I gave an anaesthetic consisting of nitrous oxide, oxygen, and trilene to a boy of 9 for the removal of a leg plaster. The anaesthetic lasted about 15 minutes, and the child's recovery was uneventful, but about half an hour afterwards his neck became swollen and painful. When I saw him some 3 hours later he had the typical appearance of a child with mumps. The swelling, which was painful and tender, gradually subsided during the next 24 hours. I have found reference in the literature to bilateral parotitis following anaesthetics, but it has been attributed to the atropine premedication. This patient had no atropine previously, so I can only conclude the anaesthetic itself was responsible for his parotitis.

#### When the Stethoscope should be left in the Bag

Dr. G. H. GRANT DAVIE writes: I have just recovered from acute bronchiolitis. This was accompanied by frequent irritating coughs induced by bronchial and tracheal gurglings, profuse frothy, sticky, mucopurulent spit, with a maximum temperature of 102°, and, what is not so often described, the presence of an uncomfortable dull rendering intrapulmonary pain as though the lung was being slowly torn apart. This reached a maximum sharp cutting type of pain when intrapulmonary pressure was raised by coughing or nose-

blowing. Under treatment, in two to three days the acute symptoms lessen, temperature and pulse rate drop, respirations are less hurried and difficult, the pulmonary pain becomes more bearable, or perhaps is only apparent on intrapulmonary effort. These diminishing physical signs and symptoms should amply satisfy the physician in charge. But what is the procedure? Out comes the stethoscope, and the patient is put through a meticulous auscultatory examination involving inspiratory and expiratory effort over an appreciable period, at the end of which he is more or less panting, with increased cardiac rate, and shortly afterwards there is a return of the sickening intrapulmonary pain with increased exudation and cough. Thus physicians ignore the first principle of their teaching that an inflamed part should be kept at rest, and unwittingly cause their patients, who in turn do their best to help, the great disservice of compelling resolving bronchioles to work at pressure. Their clinical sense should tell them that all is well, and that the less disturbance these inflamed surfaces receive the sooner repair will take place, and, what is quite important, the comfort of their patients will be enhanced.

#### Rare Medical Books

There are several rarities to be sold at Messrs. Sotheby's auction room on Jan. 24-6, derived from a number of different collections. Interesting incunabula are the first edition, Bologna, 1487, of Savonarola's *De pulsibus viriis et egestionibus*; and a *Hortus Sanitatis*, Strasburg, 1497. There is a translation by William Ward of Alexis of Piedmont's textbook of diseases, 1595; and two London editions of Th. Barrough's *Method of Physick*, respectively 1590 and 1596. Earlier than these (London, 1552) is a slightly imperfect copy of the textbook of anatomy by Thomas Geminus: more covetable, perhaps, is the Southwark-printed, 1525, *Noble Experience of the Vertuous Handywarke of Surgerv*, whose author was Hieronymus von Braunschweig; and even rarer is a pharmacological treatise by the same author from the same press in 1530. The state of medicine and surgery in England and in France is compared by G. Arnaud in some memoirs, printed 1768, next to which may be mentioned Despierre's monograph on the diseases of sailors, Paris, 1767, and Rostinio's work on venereal disease, Venice, 1556; also from Venice, though not from the same printer, is Susio on fevers and bleeding, 1571. There are two books on preventive medicine by Trafichetti, 1565, and Fonseca, 1602; and in the same category, perhaps, can be placed Philip Moore's *Hope of Health*, wherein is contained a goodlie regimene of life, London, 1564. This Moore was better known as an almanac producer and prognosticator, though whether he was the original Old Moore is not here affirmed. Among others of lesser interest one may just note two manuscripts. One is interleaved with the seventh edition, 1631, of the *Rich Storehouse or Treasure for the Diseased*, by G. W. These leaves contain many prescriptions with the names of the seventeenth-century physicians responsible for them. The other is Richard Henshall's *New System of Health*, never published; it was composed in 1728 and dedicated to Drs. Henry Hall, Robert Bostock, and Richard Brecch.

#### Resuscitation by Rocking for Heat-stroke

Dr. F. R. W. K. ALLEN writes from Poona: I have been following with interest the various modifications of stretchers for applying Eve's method of resuscitation culminating in the illustration on page 494 of your issue of Oct. 16, 1943. In case of heat hyperpyrexia there is always a danger of failure of respiration. If such cases are treated by Eve's method of resuscitation there will be no need for any interruption in the measures being taken for reduction of the temperature. Both can be carried out simultaneously. It appears that all "heat-stroke stations" should be supplied with a rocking device. I have not met with any support here, and so I should be grateful for your readers' criticism on the subject.

#### Delayed Menarche

Dr. E. FRIEDMANN writes from the Royal Free Hospital: Though it is quite true that the menarche delayed beyond the 16th birthday is not an abnormality in itself, nor does it necessarily cause trouble, there is, however, one important point that needs special emphasis. The girl may be physically well developed and show no signs of endocrine immaturity as the absence of the menstruation might suggest. But from the experience of hundreds of cases of sterility we know that there must be a definite relationship between the onset of the menarche and infertility. Quite a number of patients attending a sterility clinic are those who did not menstruate until the age of 17 or 18, although from then on they had no gross menstrual irregularity. If we consider the katamenia from this important point of view, I should think that a girl who has not started to menstruate by the age of 16 at the latest should be treated with thyroid, oestrone, and vitamins in an attempt to prevent the development of a hypoplastic uterus. The great urgency of the social problem of infertility should stimulate us to prevent rather than to cure any condition liable to lead to sterility.

# BRITISH MEDICAL JOURNAL

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## LOCALIZED SUBCUTANEOUS OEDEMA WITH WEAKNESS OF LIMB MUSCLES A SYNDROME DUE TO POLYARTERITIS NODOSA

BY

RONALD MacKEITH, D.M., M.R.C.P.

*Temporary Surgeon Lieutenant, R.N.V.R.; Medical Specialist, Royal Naval Medical Service*

The three cases of polyarteritis nodosa described here are of interest for several reasons. They all showed as the two salient features a localized soft pitting oedema of the skin of one or more limbs together with asymmetrical muscular weakness—a clinical picture not previously described. Two of these patients recovered from the illness. All three cases were diagnosed in life, the diagnosis being confirmed by biopsy. The three cases were seen in one hospital in a period of 18 months, which suggests that Leishman (1937) was right in suggesting that this disease, though very varied in its forms, should be recognized more frequently. It may be observed that during this period, although polyarteritis was being looked for, in only one other case was it suspected, and this showed a clinical picture very similar to that of the three cases. The biopsies, however, were negative.

### Case I (an Engineer aged 27)

The family history was irrelevant. There was a previous history of a cough for 12 months and of a coryza towards the end of April, 1940. On May 1, 1940, while at work, the patient injured his right calf and had to take to bed. Two days later, while in bed, he found that he had great difficulty in moving the right thigh— attempts causing pain in the groin—and that he was unable to lift his right forearm off the bed or to raise the arm at the shoulder.

On May 6, 1940, he was admitted to St. James Hospital, London. He was of slim build and in fair general condition; his temperature was 99.6° F., the pulse rate 88, and the respiration rate 24. No abnormal signs were found in mouth, lungs, heart, or abdomen; his blood pressure was 135/85 (a week later it was 120/80). A mild degree of clubbing of the finger-nails was present. There was considerable weakness of the right deltoid and biceps muscles, which were tender on palpation. The right upper arm was swollen—the circumference being 9½ in., against 8 in. on the left side—from diffuse soft pitting oedema. The skin was not inflamed. There was no sensory loss or any paraesthesiae at this time or later. The muscles of the right thigh were weak and tender, and pain was felt on externally rotating the flexed thigh. There were two subcutaneous nodules on the outer side of the right calf, but no oedema there. The left arm and leg were normal. The patient was treated by rest in bed and a high vitamin diet (with bexax, cod-liver oil, ascorbic acid, and iron), and massage at a later stage.

**Investigation on Admission.**—Urine, nothing abnormal. Blood urea, 36 mg. per 100 c.cm. Blood count: R.B.C. 5.5 millions; Hb 92% (Haldane); platelets normal; W.B.C. 12,000—neutrophils 79%, lymphocytes 15%, monocytes 6%. (Nine days later: Hb 97%, W.B.C. 12,000, neutrophils 69%.) Sedimentation rate, normal. Sputum: no tubercle bacilli on 3 examinations; culture pneumococci. Radiograph of chest (May 13, 1940): Increased markings at both hila, and a small amount of fluid or thickened pleura at the left base. (A further chest radiograph two weeks later showed no change.) A radiograph of the right upper arm revealed no abnormality. Cerebrospinal fluid: Clear, colourless, 2 cells per c.mm.;

protein, 40 mg.; globulin nil; chlorides, 740 mg.; W.R. and Lange negative. Blood W.R. and K.R. negative. An electrocardiogram on May 26 showed poor T-waves and slight elevation of ST, with depression of ST. These changes were still present 10 days later.

**Progress in Hospital.**—For 2½ weeks he had a symptomless pyrexia and a rather longer-lasting tachycardia (Fig. 1). The swelling of

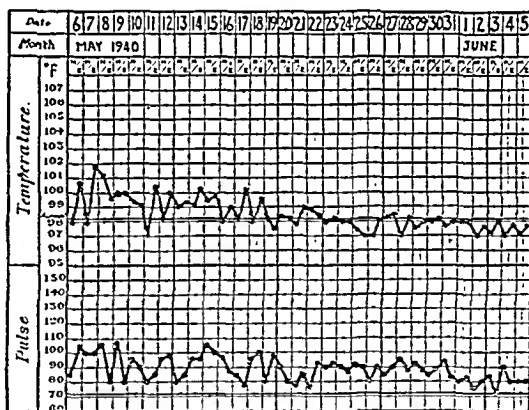


FIG. 1.—Temperature and pulse chart of Case I.

the right arm had increased the day after admission to 10½ in. circumference, but in a few days it began to diminish and in two weeks it was gone. The weakness of the right arm and shoulder persisted for 10 days before improving, but had cleared up in 4 weeks. A week after admission there was still tenderness at the insertion of the biceps muscle, and some pain was felt on using the triceps. There was also a tender nodule, about 0.5 cm. in diameter, beside the brachial artery at the level of the biceps tendon. The power of the right thigh improved from the time of admission. A week after admission one small tender subcutaneous nodule was observed on the outer side of the right calf, and also an erythema-nodosum-like lesion of the skin over the shin. On May 11 he complained of pain in the left orbit, but no lesion or oedema was seen. The patient started getting up on June 3, and for a few days after this the dorsum of the right foot showed a little soft oedema. There was no tenderness or weakness of muscles of the legs, and the ankle-jerks were present though not brisk. On June 9, five weeks after admission, he left the hospital quite well.

On May 22 a biopsy specimen was taken of a nodule, 0.3 cm. in diameter, attached to a small subcutaneous vessel in the right arm. The histological report was: "Polyarteritis nodosa in nodule from subcutaneous tissue of arm."

Two and a half years later, in Oct., 1942, he and his private doctor both reported that he had remained perfectly well.

**Case II (a House-painter aged 63)**

This man had had a chronic cough for many years. He took alcoholic drinks in moderation only. On Nov. 5, 1940, he developed "numbing pain" in the lumbar region and shoulders radiating down the arms. There was no weakness of the limbs. Two days later his ankles began to swell and he became short of breath. On Nov. 11 he was admitted to St. James Hospital.

On admission his general condition was fair. His temperature was 97.6° F., pulse 84 regular, and respirations 20. The heart was normal in size and sounds; the brachial arteries were thickened. There was soft pitting oedema ++ of the ankles, but nothing else to suggest congestive heart failure. He was not orthopnoeic. The lungs showed signs of diffuse bronchitis, but there was little sputum and no haemoptysis.

**Investigations on Admission.**—The urine was normal. There were moderate anaemia and a leucocytosis (R.B.C. 3.5 millions, Hb 77%; W.B.C. 15,200—neutrophils 85%, eosinophils 1%, lymphocytes 11%, monocytes 3%). The blood W.R., K.R., and gonococcal complement-fixation test were negative. The blood sedimentation rate was very rapid—53 mm. on 100 mm. column at 1 hour. The sputum showed no tubercle bacilli; one culture yielded a fair growth of *Friedländer's bacillus*. An x-ray film of the chest showed only the increase in vascular markings common in chronic bronchitis. Radiographs of the limbs revealed no abnormality in bones or joints. The blood urea six weeks after admission was 60 mg. per 100 c.cm., and

left wrist and hand. On the right side there was now no weakness or pain.

On Dec. 6 and 7 he complained of a "different sort of pain" in the abdomen. There was tenderness at the renal angles, and the urine, previously normal, contained albumin, with many red cells and a few leucocytes in the deposit. Some albumin and blood were present in the urine every day from this time till his death five weeks later; and in the last three weeks of his life there were increasing numbers of granular casts. On Dec. 6 it was observed that a mild clubbing of the finger-nails had developed since his admission.

On Dec. 9 he had a severe pain in the left leg and tenderness in the lateral part of the left popliteal fossa, but no fresh oedema. A week later he was becoming drowsy and losing ground. There was now oedema of the ankles, the back of the left thigh, and the left upper arm. The blood count on Dec. 17 showed Hb 72%, W.B.C. 15,600 (neutrophils 80%, eosinophils 5%). He was given a transfusion of a pint of citrated blood, and two days later the blood count was Hb 80%, W.B.C. 15,600 (neutrophils 84%, eosinophils 4%).

He was now (Dec. 19) complaining of severe pain, and the oedema was present in the right thigh as well as the left, and there was a manifest left wrist-drop. He was started on injections of vitamin B<sub>1</sub>,



Fig. 2.—Case II. Photomicrograph showing necrosis of arterial wall. Stained haematoxylin-eosin. ( $\times 95$ .)

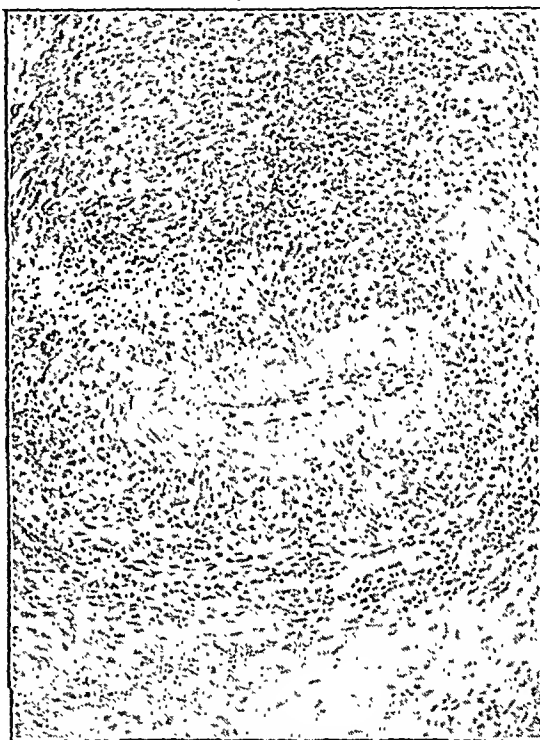


Fig. 3.—Case II. Photomicrograph showing polymorph infiltration in vessel wall. Stained haematoxylin-eosin. ( $\times 140$ .)

the plasma protein at this time showed a great rise in albumin. Total protein, 9.9% (normal 5.6 to 7.8%); albumin 7.55% (normal 3.4 to 4.9%); globulin 2.35% (normal 1.2 to 2.9%).

The patient was treated by rest in bed, with bexam, iron, and theophylline by mouth and simple analgesics for the pains.

**Progress in Hospital.**—Four days after admission he developed pain in the legs. The calf muscles were tender and movements of the ankle-joints were painful and weak. The ankle-jerks were absent, the knee-jerks faint, the plantar responses flexor, and the abdominal reflexes present. There was no pain or oedema in the upper limbs at this stage, but the triceps-jerks were absent. No inflammation of the skin or any nodules were present at this or any later stage.

Though the oedema of the feet persisted, the pain in the legs cleared up in a week; but before it had gone pain developed at both elbows. On Nov. 17 neither elbow could be fully extended; the right ulnar nerve was tender but not the left. In contrast there was pitting oedema of the dependent skin at the left elbow, but none on the right. There was also tenderness deep in the right antecubital fossa. A blood count at this time showed no leucocytosis (W.B.C. 6,200), though the B.S.R. was still very rapid—48 mm. at 1 hour. On Nov. 23 pain and soft pitting oedema had appeared at the back of the left thigh, and the pain at the left elbow was worse.

On Nov. 27 the patient complained of paraesthesiae in the right hand; but the legs and arms were much more comfortable, and the swelling at the left elbow began to diminish. A week later, however, he had a severe pain in the left forearm, with tinglings in the left hand, diffuse swelling of the left forearm, and weakness of the

2 mg. on alternate days. On Dec. 24 he was definitely better, with less pain and oedema but some mild paraesthesiae of the hands and feet. The knee, ankle, triceps, and supinator jerks were absent, and the responses from the biceps were faint. The blood pressure was 150/110; there were no signs of congestive heart failure.

The anaemia and leucocytosis were both increasing (Hb 66%; W.B.C. 22,000, neutrophils 97%, on Jan. 3, 1941). He became steadily weaker, his face getting thinner, with an earthy pallor. Oedema now appeared in the right as well as the left arm and increased, and in the legs it became generalized. A course of sulphapyridine was without any good effect. He died on Jan. 12, 1941.

The biopsy report on material taken on Dec. 9, 1940, from subcutaneous tissues and flexor muscles of the left arm was: "Polyarteritis nodosa. Hyaline necrosis of wall of small artery with surrounding acute purulent inflammatory reaction." (Figs. 2 and 3.)

**Necropsy.**—A necropsy was made the day after death. The bronchi contained much mucus and were somewhat dilated at their terminations. Both lower lobes showed diffuse bronchopneumonia. The heart muscle appeared quite normal. There were lines of redness along the descending branches of the right coronary artery, but no nodules or aneurysms. Atheromatous patches were present in both coronary arteries and in the aorta. No nodules were seen on the mesenteric vessels. The liver showed only slight venous congestion. Both kidneys had a smooth surface mottled from many

cortical infarcts. On section the cortex was of normal width; there were two small circular areas suggestive of aneurysm.

**Histological Report.**—The kidneys showed diffuse chronic nephritis and focal ischaemic nephritis, and also severe chronic purulent inflammation and necrosis of arcuate arteries, some with canalized organized thrombosis. Aneurysmal dilatation of an artery and a purulent infarct of the cortex were also seen. There was chronic purulent inflammation and necrosis of coronary arteries of the heart and of arteries in the mesentery. Tissue from the axilla showed chronic purulent inflammation of the axillary artery and of its branches in adherent nerve and muscle. Changes in other organs were bronchopneumonia, chronic septic spleen, congestion of the liver, and fibrosis of the myocardium.

### Case III (an Escalator Engineer aged 58)

This patient had a history of recurrent coughs. He took no alcoholic drinks. About August 10, 1941, he developed aches and pains all over and a dull pain at the navel. There were night sweats, and he noticed that he was passing less urine. He had an occipital headache, poor vision and weeping eyes, and some attacks of faintness. His appetite remained good. A week after the onset of these symptoms he began suddenly to have numbness and tinglings and weakness of the hands, progressing to uselessness, and similar paraesthesiae and a slighter degree of weakness of the legs and feet. Two weeks after the illness began the left side of his face became puffy and the ankles swelled. He was admitted to St. James' Hospital on Sept. 1, 1941.

He was in fair general condition, of sallow complexion; temperature 98°, pulse regular 76, vessel not thickened; respirations rapid (44) but not distressed. The heart size and sounds were normal. There was no orthopnoea; the lungs were clear. There was no venous engorgement or hepatic enlargement; his blood pressure was

peripheral neuritis. The patient was treated by rest in bed with a high vitamin diet. He was given aneurin 10 mg. by intramuscular injection daily for four days, and splints and physiotherapy for the limbs.

**Investigations.**—Circulation times (Sept. 12) normal (ether 8 and 10 seconds; cyanide 15 and 15 seconds). An x-ray film of the chest showed no evidence of disease of the lungs, heart, or mediastinum. Blood W.R. and K.R., negative. Blood urea variable—70 mg. per 100 c.cm. (Sept. 4), 36 mg. (Sept. 16), 70 mg. (Sept. 23). Plasma proteins (Sept. 16) were very high from excessive amount of albumin (total 8.45%—albumin 5.9, globulin 2.55; albumin/globulin ratio 2.3 : 1 (normal values: total 5.6–7.8%; albumin 3.4–4.9, globulin 1.2–2.9; albumin/globulin ratio 2–3 : 1). A blood count on admission (Sept. 2) showed anaemia and a neutrophil leucocytosis. (R.B.C. 4.3 millions, Hb 68%, C.I. 0.8; group O; W.B.C. 9,800—neutrophils 84%, eosinophils 4%, lymphocytes 10%, monocytes 2%.) Serum salts (Sept. 23): chloride 580 mg., potassium 14.5 mg., sodium 324 mg. (normal values: 560–620, 16–20, 325–350).

**Progress in Hospital.**—During his 3½ months in hospital the patient's temperature was often raised (Fig. 4). A course of sulphathiazole started on Sept. 13 had no effect. The blood pressure—200/110 on admission and 225/135 two days later—gradually fell to 160/90 (Oct. 23). The abnormal urinary constituents gradually diminished to a little albumin with a few red cells in the deposits. The oedema varied but never disappeared. There were never any signs of heart failure, right- or left-sided. The pain in the limbs varied; at one time he complained of shooting pains, but chiefly of the numbness and progressive weakness of the hands. The anaemia increased; three weeks after admission the Hb was 48%, with W.B.C. 7,200 (neutrophils 79%, eosinophils 7%).

On Oct. 1, a month after admission, he developed diarrhoea. The stools contained no mucus, blood, parasites, or pathogenic organisms.

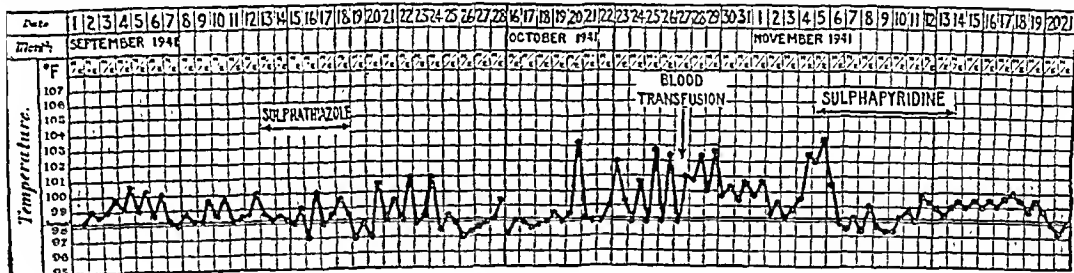


FIG. 4.—Temperature chart of Case III.

200/110. Slight tenderness was felt in the loins. The urine contained much albumin, the deposit showing many red cells, a few leucocytes, and some hyaline casts; no organisms were seen or grown on culture. There was much soft pitting oedema of the upper limbs, especially in the dependent part of the forearms and near the elbows; this was more extensive on the right side. There was also soft oedema behind the ankles, especially on the left. The face was free of oedema.

Examination of the nervous system revealed no defect of the cranial nerves. Both deltoids showed some weakness. On the right side there was slight power of flexion of the fingers but complete wrist- and finger-drop, and flexion and extension of the elbow were weak. On the left side he could not oppose the thumb and fourth finger, but flexion and extension of fingers and of wrist were good; there was fair power of flexion of the elbow but considerable weakness of extension. The lower limbs showed slight general weakness. The right triceps, biceps, and supinator jerks were absent, while on the left they were respectively sluggish, normal, and sluggish. The left knee-jerk was brisker than the right; the ankle-jerks were both sluggish. The plantar responses were flexor, the lower abdominal reflexes absent, and the upper normal.

The electrical reactions of the muscles were tested. In the left upper limb these were normal. On the right all muscles reacted to galvanism; to faradism the triceps and extensor muscles of wrist and fingers did not react; the deltoid and biceps reacted weakly; and the muscles of the flexor aspect of the forearm and the intrinsic muscles of the hand reacted normally.

There was on the right a gross loss of sensation of the hand and lower part of the forearm; and on the left, of the hand only. The legs showed diminished sensibility to light touch, of stocking distribution. Position and vibration sense were good. There was no tenderness of the muscles of the upper or lower limbs.

The combination of an asymmetrical polyneuritis with oedema suggested the probability of polyarteritis nodosa. Dr. E. A. Blake Pritchard saw the case; he thought it was not a syndrome due to

Per rectum several small submucous nodules could be felt. Sigmoidoscopy showed a normal mucosa. By the middle of October there was much soft oedema in the lumbar region as well as in the elbow regions and at the ankles. The muscular weakness had increased in the left wrist, in both arms, and in the dorsiflexors of the ankles. There was marked wasting of the intrinsic muscles of the hands and of all the limbs. The loss of pinprick perception in the hands was more extensive. In the feet there was analgesia on the right to the midfoot and on the left to the ankle.

On Oct. 23 the pyrexia became more severe without evident cause. On Oct. 27, as the anaemia and leucocytosis persisted (Hb 56%, W.B.C. 10,200—neutrophils 81%, eosinophils 2%), he was given a blood transfusion. During the following week he developed a cough and fever, with diarrhoea and signs of consolidation of the right lower lobe (Nov. 5). He was given a course of sulphapyridine, and the fever and diarrhoea cleared up. For a time he seemed to be losing ground, but at the end of November he was feeling better, the oedema was lessening, and no eosinophils were seen in a blood count (Hb 58%, W.B.C. 8,600—neutrophils 74%). The chest still gave many moist sounds. He continued to improve, though the hands and fingers were becoming contracted despite splinting and so on. At his own request he went home on Dec. 23, 1941, though he was still too weak to sit up in bed by himself.

**Further Progress.**—At home he remained in bed for three months, improving steadily. Six months after leaving the hospital he came to the out-patient department. His face was fat and ruddy; there was no oedema anywhere. Both hands were wasted and contracted—on the left a claw-hand, but on the right flexion at the metacarpophalangeal joints. The power in the upper arms and elbows was fair. The blood pressure was 245/150, and he had some morning headaches and giddiness. In Oct., 1942, he wrote to say that he was feeling fine; the left hand was still weak and contracted; but the right, which had been the worse, he was able to use for shaving and writing. The legs were still improving, and he could walk a mile or so.



**Biopsy Reports.**—A week after admission a biopsy specimen was taken of skin, subcutaneous tissue, and muscle from the back of the right forearm. The report on this was: "Slight chronic inflammation of fragment of skin, and fibrosis and degeneration of fragments of voluntary muscle. No evidence of polyarteritis nodosa." A second biopsy was made a month later (Oct. 9, 1941). The report on this was: "Degeneration and slight fibrosis of voluntary muscle. Changes consistent with polyarteritis nodosa in one small artery." (Fig. 5.)



FIG. 5.—Case III. Photomicrograph showing inflammatory reaction in vessel wall. Stained haematoxylin-eosin. ( $\times 190$ .)

### Discussion

Three cases of polyarteritis nodosa, in which the diagnosis was confirmed by biopsy, were seen in 18 months. In a further case, clinically similar, the biopsies were negative. (This was a woman, aged 66, who had had diabetes mellitus and probably hypertension for years. She developed stiffness, pain, and weakness in both forearms, with paraesthesiae in the fingers. Much soft pitting oedema of the forearms occurred, with some contracture of the fingers. There was cardiac hypertrophy, but no evidence of congestive heart failure. She had high plasma proteins; total 7.6% (normal 5.6 to 7.8%)—albumin 5.35% (normal 3.4 to 4.9%), globulin 2.25% (normal 1.2 to 2.9%). After two months the right arm and hand improved; the left remained contracted. Though the clinical picture and the high plasma proteins closely resembled the three cases described below, two biopsies showed no evidence of polyarteritis nodosa; this case therefore cannot be considered as proved to be polyarteritis nodosa.)

The chief features of the three proved cases are summarized in the Table. They showed, as the salient features, localized soft oedema of the subcutaneous tissues of one or more limbs, with asymmetrical muscular weakness. The aetiology of polyarteritis nodosa is still without any definite conclusion, but it is interesting that two of the cases started with aches all over and the other shortly after a coryza. All three showed a leucocytosis, but eosinophilia was not a feature. Skin nodules were present in one case only. (Harris *et al.* (1939) pointed out that eosinophilia and nodules are too rare to be of practical value in diagnosis.) In the two cases in which the estimation was made, the total plasma proteins were very high owing to increase of plasma albumin. This finding may be of diagnostic value. The treatments employed were simple: rest in bed, a high vitamin diet supplemented by injections of vitamin B<sub>1</sub>, and splinting and massage for the limbs. The progress of Case I suggests that it is possible to recover completely, while

in Case III there was apparently complete recovery from the acute attack, though certain sequelae remained.

### Summary of Cases

	Case I	Case II	Case III
Sex and age .. ..	M. 27	M. 63	M. 58
Previous history .. ..	12 months' cough; recent coryza	Chronic bronchitis	2 years' recurrent bronchitis
Onset .. ..	Sudden weakness right arm and thigh	Pains in back and dyspnoea	Aches all over
Oedema .. ..	Right upper arm	Successively in ankles, left elbow, left thigh, right elbow, and both legs	Elbows, forearms, ankles, and lumbar region
Nodules .. ..	2 in skin of leg	None	In rectal mucosa
Muscular weakness .. ..	Right arm and thigh	Left wrist-drop, etc.	Right wrist-drop, etc.
Muscle tenderness .. ..	Yes	Yes	No
Contractures of hands .. ..	No	No	Yes (late)
Reflexes .. ..	—	Impaired or absent in affected limbs	Asymmetrically impaired
Sensory disturbance .. ..	None	Paraesthesiae	Paraesthesiae; anaesthesiae
B.P. on admission .. ..	135/85	150/110 (five weeks after admission)	200/110
Urinary abnormalities .. ..	None	None at first; then albumin, blood, and casts	Albumin ++
Lungs .. ..	Thickened pleura (x-ray)	Increasing bronchitis	Intercurrent pneumonia
Clubbing of nails .. ..	Mild	Mild	None
Anaemia (Hb %) .. ..	92%	77%, falling to 57%	68%, falling to 56%; normal six months later
Leucocytosis .. ..	12,000 and 12,000	6,200 to 22,000	10,200 to 7,200
Eosinophils % .. ..	0.0	1.0, 0.5, 4.0, 0.0	4.7, 2.2, 0
Plasma proteins (%) .. ..	—	—	—
Total (normal 5.6-7.8) .. ..	—	9.9	8.45
Albumin ( " 3.4-4.9) .. ..	—	7.55	5.9
Globulin ( " 1.2-2.9) .. ..	—	2.35	2.55
Biopsy .. ..	Positive	Positive	Neg. Pos.
Course of disease .. ..	Recovered in one month. Remains well 2½ years later	Died after two months' illness	Recovered after six months; with residual contractures of hands and weakness of legs

### Summary

Three cases showing localized soft oedema of the subcutaneous tissues of the limbs with asymmetrical muscular weakness are described. The diagnosis of polyarteritis nodosa was confirmed by biopsy. A large increase in plasma albumin was found in the two cases in which this estimation was done. One patient recovered completely, one recovered from the acute illness with muscular contractures and hypertension, and one died.

I thank Dr. W. Allen Daley, Medical Officer of Health to the London County Council, and Dr. N. S. Craig, Medical Superintendent of St. James Hospital, for permission to publish these cases. I wish also to thank Miss E. Edwards, S.R.N., Miss Westlake, S.R.N., Dr. M. L. Playfair, and Dr. A. B. Britton for their help.

### REFERENCES

- Leishman, A. W. D. (1937). *Lancet*, 1, 803.  
Harris, A. W., *et al.* (1939). *Arch. intern. Med.*, 53, 1163.

The University Extension and Tutorial Classes Council, in co-operation with the Provisional National Council for Mental Health, will hold this year, provided enough applications are received, the usual course for medical practitioners on mental deficiency and allied conditions. The lectures will be given at the London School of Hygiene and Tropical Medicine, Keppel Street, Bloomsbury, and the date fixed for the course is April 24 to May 5. The University of London will grant certificates of attendance to those who attend regularly, taking both theoretical and practical work. The registration fee, to be paid at the time of application, is 10s. 6d., and the fee for the course is £5 15s. 6d. Cheques should be made payable to the Provisional National Council for Mental Health, and crossed Barclays Bank Ltd. All communications with reference to the course should be addressed to Miss Evelyn Fox, C.B.E., c/o University Extension Department, University of London, 39, Queen Anne Street, W.1. Intending candidates are asked to apply at the earliest possible date, but in any case by March 18. Detailed time-tables and other information will be sent out a week before the course opens to each person proposing to attend. Should the course have to be cancelled all fees will be returned.

## EMPHYSEMA OF THE LUNGS\*

BY

RONALD V. CHRISTIE, M.D., D.Sc., F.R.C.P.

*Professor of Medicine in the University of London, Physician to St. Bartholomew's Hospital*

## PART II

## Physical Signs

The mechanism by which loss of pulmonary elasticity may lead to enlargement of the thoracic cage has already been discussed. The diaphragm because it is no longer pulled upwards by the lungs, descends and becomes less convex, and its movement on inspiration is greatly diminished. Because of its loss of tone the diaphragm may also present an irregular outline in the radiograph. The intercostal muscles will also be unable to perform their proper function, as they are concerned with moderate inspiration and the chest is already expanded when inspiration begins, to expand the chest further the accessory muscles will have to be used, particularly the pectorals, and these raise the front of the chest as a whole in a "heaving" manner, such as occurs in a normal individual towards the end of a forced inspiration. Thus inspiration has to be performed by means of an unnatural inspiratory effort, and the patient with emphysema will encounter even greater difficulty in deflating his lung. Normally, expiration is largely, if not wholly, a passive act: the thoracic cage is pulled inwards by the elastic recoil of the lung. With loss of elasticity there must be loss of elastic recoil, so that if the lung is to be deflated it has to be squeezed. The respiratory musculature was not built for this task, and the intercostals have to be assisted by the accessory muscles of expiration: the muscles of the abdominal wall can often be felt to contract on expiration, which is prolonged as it is in other conditions, such as asthma and tracheal obstruction, in which the lungs have to be compressed by an active muscular effort. With so extensive an impairment of both inspiration and expiration it is not surprising that the vital capacity and chest expansion are reduced.

Many of the physical signs which can be elicited from the lung itself can be explained on the basis of loss of elasticity. I have already emphasized that, in the inelastic lung, distribution of expansion might be expected to be far from equal and should be greatest where the force is applied, which is on the peripheral parts under the visceral pleura. It would be reasonable to expect that, as the application of this force is repeated many thousands of times daily, the superficial air sacs next the pleura would in time become over-distended. With over-distension their supporting framework would be lost and further stretching would become easier, so that a true vicious circle might be established. It is easy to imagine that this mechanism could be the cause of the over-distension of superficial air sacs, with bulla formation, which occurs in emphysema, although the usual explanation given is that cough distends these air sacs. It is obvious, however, from the mechanism of coughing, which is discussed below, that the lung is compressed rather than distended, and it does not seem possible that cough could be responsible for the formation of bullae, except perhaps in poorly supported areas such as the apex of the lung. Presumably it is this superficial over-distension of air sacs and bulla formation which causes the remarkable hyperresonance of the percussion note—a note which is often more resonant than over a pneumothorax. Why this should occur has not been explained, but it may well be that the over-distended air sac acts as a sound-box or resonating chamber, in the same way as does a cavity. It is also easy to imagine how this distension might occur, more particularly along the edges of the lung, where so-called pleural sinuses exist. With each inspiratory effort on the part of the pectoral muscles the anterior chest wall is pulled outwards and upwards as a whole, and much of this force must be expended on pulling the lung into the pleural

sinuses so as to fill the potential gap between the chest wall and the heart. In time this part of the lung will become over-distended, so that there is a gap between the heart and the chest wall, filled by lung. This space can be clearly seen in the lateral view of a radiograph, and it explains a variety of physical signs. The absence of the apical impulse, loss of cardiac dullness, and distant heart sounds necessarily follow. The expansion of the lung, so that it covers the heart in considerable depth, may also in part account for the increase in antero-posterior diameter and the barrel shape of the chest. Similarly the loss of liver dullness must in part be caused by expansion of the lung into the pleural sinuses, although the low position of the diaphragm is of course another factor.

All these changes can be explained directly or indirectly on the basis of loss of elasticity; but it should not be forgotten that enlargement and deformity of the thorax and its contents are partly dependent on other factors, such as the elasticity and mobility of the thoracic cage. These factors vary with the age and build of the patient, and are presumably responsible for the inconstancy and unreliability of the physical signs of emphysema. There remain several physical signs which have not been discussed or explained. Breath sounds are usually faint, especially at the bases, where they may be inaudible; but as I do not know how vesicular breath sounds are produced in health it is difficult to discuss the reason for their suppression. A possible explanation, held by some Continental writers, is that vesicular breathing is produced by the jet of air thrown into the atrium from the alveolar duct. The absence of this mechanism in emphysema has already been discussed, and may be responsible for the suppression of breath sounds. Vocal resonance and fremitus are sometimes decreased in emphysema. I have no explanation to offer for this, as I do not understand the mechanism of conduction of the spoken voice in the healthy lung, although I know of several theories which do not fit the facts.

There are several factors which may contribute to the formation of the barrel-shaped chest, and, although these are not entirely independent of one another, their relative importance probably varies from patient to patient. I have already described how loss of elasticity contributes two factors towards this change: the first was the inspiratory position of the chest, and the second the expansion of the lung between the heart and the sternum. A third important factor must be the dorsal kyphosis, which is distributed throughout the thoracic vertebrae, and which may produce an increase in the antero-posterior diameter by the same mechanism as in Pott's disease. There are thus at least three separate causes for the deformity of the chest, and another factor must be the diminishing flexibility of the chest wall with advancing age. It is not surprising, therefore, that the barrel-chest phenomenon is variable, being marked in some cases and inconspicuous in others.

Thus loss of elasticity alone could directly or indirectly cause the dyspnoea of emphysema, almost all the physical signs, and a considerable proportion of the morbid anatomical appearances. There are, however, a number of changes characteristic of emphysema which I am unable to explain on the basis of loss of elasticity. These are the destruction and degeneration of alveolar walls and blood vessels, the degeneration and atrophy of the pleura, and the degeneration with loss of elasticity of the costal cartilages and the thoracic vertebral cartilages. All these structures are part of the respiratory apparatus, and it is reasonable to suppose that the cause of this widespread damage is also the cause of the degeneration of the elastic fibres themselves. The nature of this destructive agent is discussed below.

## Aetiology

In seeking the fundamental cause of emphysema I have described the fallacy of thinking in terms of over-distension and overstretching of the lungs. The lungs as a whole are not over-stretched, and we should think rather of some agent which produces destruction and degeneration of many of the structures concerned in respiration, both in the lung and outside it. With this in mind I propose to review briefly the various theories that have been suggested as the cause of emphysema.

The expiratory theory is that the air sacs become over-distended because they cannot be emptied. The inspiratory

\* An abridged version of the Goulstonian Lectures delivered before the Royal College of Physicians on March 4, 9, and 11, 1943.

theory claims that over-distension is produced because too much air is drawn into the lungs by the increased inspiratory effort which precedes coughing and which may be associated with asthma, manual labour, and occupations such as glass-blowing and the blowing of wind instruments. There is also a theory that emphysema is primarily due to a faulty position of the chest and that it is the enlargement of the thoracic cage which causes overstretching of the lung. Many criticisms have been levelled against these three theories, but I will only repeat that, from the evidence already described, all of them appear to be based on the false assumption that the lung as a whole in emphysema is truly overstretched and over-distended.

It has been claimed, from quite unconvincing evidence, that local impairment of nutrition is the cause of emphysema. I have pointed out that under resting conditions there is no diminution in the total amount of blood flowing through the lungs, and it is also true that in other diseases there may be more extensive atherosclerosis than is seen in emphysema, although the lung does not become emphysematous. For these reasons it is improbable that the vascular changes in the lung are of any aetiological significance.

It has been suggested that the lung changes are primarily degenerative or atrophic; but this is too easy a way of evading the issue, as it by no means explains the many aetiological factors known to be involved. The most obvious of these concerns respiratory obstruction. Almost all cases of emphysema have a long-standing history of chronic bronchitis or asthma, or both, and this is also true of emphysema in horses and cattle. The effects of cough and bronchial spasm on the lung, and their mechanism, are therefore of primary importance in any discussion on the aetiology of this disease. The mechanism of coughing is simple. There is a short inspiratory effort which by no means fills the chest to full capacity; the glottis is then closed, and the lungs are forcibly compressed by all the muscles of expiration, so that the pressure of air in the alveoli may rise to over 50 mm. of Hg (Kountz and Alexander, 1934; Rasmussen and Adams, 1942). The glottis is then opened and the strain on the ribs, the pressure on the pleura, and the pressure in the alveoli are suddenly released. In the case of the alveoli there must be a wave of pressure change passing from the bronchi out to the periphery of the lung. It is presumably this sudden release of pressure which is responsible for the sensation, usually experienced, that the lung is being distended. It is obvious, however, from the mechanism of coughing, that the lung is compressed and not in any sense distended. This building up of pressure followed by its sudden release must mean increased stress and strain on all the structures involved, especially on the alveolar walls, which are not robust and through which passes this wave of pressure change. A chronic bronchitic may cough scores of times in a day, and it seems reasonable to suppose that this type of stress and strain, or wear and tear, repeated over many years, could in time produce the loss of elasticity and degenerative changes observed in the alveolar walls. In many respects there is an analogy in hypertension, in which, without any overstretching of the blood vessels, there may be loss of elasticity and other degenerative changes, and these are ascribed by recent investigators to the chronic stress of raised pressure. Outside the lungs it is also reasonable to suppose that wear and tear might occur when cough is chronic. The pleura might suffer for the same reason as the alveoli, and the thoracic cage is also strained: one has only to place a hand over the costal cartilages while coughing to realize that the impact is considerable.

In asthma there may be the same degree of change in intra-alveolar pressure as in coughing, and although the change is not so sudden, it is repeated more often (v. Neergaard and Wirz, 1927; Hartwich, 1930). This stress and strain repeated many thousands of times a day should have the same effect as chronic cough. The mechanism of the experimental production of so-called emphysema by tracheal stenosis in animals is presumably the same (Paine, 1940a, 1940b). It is also true that during an acute attack of bronchial asthma the increased expiratory resistance may lead to distension of the lung, which tends to subside when the attack is over. This temporary distension does not rupture the alveolar walls, or in fact lead to any permanent damage, but it probably does add to the stress and strain produced by the other factors I have described.

Almost all patients with emphysema suffer from either chronic bronchitis or asthma, and in these cases the explanation of the pathogenesis of emphysema which I have given is the most likely one. It is also true that some patients with chronic bronchitis or asthma develop emphysema comparatively rapidly, while others never become emphysematous. The forcefulness of the cough is obviously an important factor, and age is another. To discuss the changes in resistance to wear and tear or to trauma that occur in senescence would in itself occupy several lectures, but no one would dispute that with age there is a decrease in the resistance of the tissues. This is particularly true of the elasticity of the blood vessels; and with advancing years there may also be diminished resistance in the lungs, and in the elastic structures of the thoracic cage, to the stress and strain of cough or of asthma, and this diminution in resistance may take place earlier in some individuals than in others.

There still remains to be explained the unusual case of emphysema with no previous history of asthma or chronic bronchitis. I have seen three such cases when shortness of breath preceded the onset of cough, and in one the diagnosis was confirmed at necropsy. I can only suggest that, very rarely, the stress and strain on the lung which occurs with ordinary breathing may be sufficient to destroy its elasticity.

Other aetiological factors have been suggested, and a hereditary tendency to emphysema is one. This may be so, but I have not seen it except indirectly as a possible familial tendency to asthma and chronic bronchitis. Hard manual labour is another, but my own belief is that this is only of importance in that it increases the incidence of chronic bronchitis and accelerates the process of ageing. It is also a striking testimony to the conservatism of medical teaching that there is scarcely a textbook of medicine which does not quote glass-blowing and the blowing of wind instruments as probable or possible causes of emphysema; and this in spite of ample evidence in the literature that no such aetiological relationship exists (Christie, 1939). The original statement of Laennec, made in 1819, based on no actual cases, has been copied from textbook to textbook over a period of 120 years.

### Diagnosis

I believe it is those with little clinical experience who think they have a clear conception of the diagnosis of emphysema. The pathology of the disease as taught is quite precise and the description of its clinical manifestations is equally so, but the differential diagnosis is not even mentioned in most textbooks. It is those with wide clinical experience who have expressed difficulty in interpreting the so-called physical signs of emphysema. I have discussed the diagnosis of emphysema with many clinicians, and have found a wide divergence of opinion as to the reliable signs of this disease. All were agreed that the physical signs as traditionally described could be of value in diagnosis but could also be misleading. Obliteration of the cardiac dullness, diminished chest expansion, reduction in vital capacity, and the radiograph were each suggested as being most valuable in doubtful cases. I can find no agreement—in fact, there is wide disagreement—with regard to the relationship of the barrel-chest phenomenon to emphysema. Some believe, and teach, that the physical signs associated with the barrel-shaped chest, if definite, necessarily mean emphysema, although they admit that the lesion may neither progress nor lead to symptoms. Others believe that the barrel-chest phenomenon may occur quite independently of emphysema, and that in these circumstances it is of no significance. Such a divergence of opinion as to the diagnostic criteria naturally makes for scepticism, and attempts to correlate the clinical diagnosis of emphysema with the facts as revealed by necropsy have led to further doubts. It has been stated that only a small proportion of those diagnosed at necropsy are recognized during life, and it has also been shown that many of those with barrel-shaped chests furnish no evidence of emphysema when they come to the post-mortem table (Cabot, 1927; Davidson, 1936; Roelsen, 1938). For this reason some writers have gone so far as to say that the physical signs of emphysema are meaningless. I believe that this is certainly untrue, just as I believe that the textbooks are misleading, to say the least, in the neat array of physical signs which they present.

In order to determine the reliability of these physical signs Dr. P. Hill and I have reviewed 72 cases diagnosed on the post-mortem table as generalized hypertrophic emphysema. All of these cases came from the medical wards of the London Hospital, but an accurate and detailed case history was not always available, as some were moribund on admission. A history of chronic cough was given in 94%, and in a quarter of these it was associated with mild or severe asthma. Dyspnoea on exertion was present in 78% of the 45 case histories in which mention was made of the presence or absence of this symptom. In the majority of cases, however, the physical signs of emphysema were not observed. In 35% there was enough evidence to suggest an "emphysematous chest," but in only 13% could this evidence be said to be complete. This series of cases suggests that a more reliable guide to a diagnosis of emphysema than the physical signs is a history of chronic cough or asthma, associated with dyspnoea on exertion. I have therefore investigated another series of 25 patients who gave such a history and in whom no cause of dyspnoea other than emphysema could be discovered. In 92% of them two or more of the physical signs of emphysema were present, and in these a diagnosis of "emphysematous chest" might have been made: in 90% expiration was prolonged, but the incidence of any other individual physical sign was not more than 72%, and only 44% showed the traditional picture of emphysema. The average age of these patients was 54 years, and as a control to this series I have analysed a group of 40 patients, all over the age of 45, none of whom had a history of either cough or dyspnoea. In 9 of them the chest might have been said to be "emphysematous," and 4 presented the classical physical signs of emphysema.

The only conclusion that can be drawn from these series of cases is that the signs of emphysema are unreliable: they may be absent in patients suffering from the disease, and are not uncommonly present in patients without emphysema. Several special diagnostic methods have been recommended; but these are seldom used, and their reliability has not been established. The vital capacity in emphysema is usually diminished. I have made this measurement on 25 cases, all of them with a history of chronic bronchitis and dyspnoea on exertion. In 20 the vital capacity was less than 70% of the normal standard, as calculated from the surface area, and in 13 it was less than 60%. There is a natural tendency during senescence for the vital capacity to diminish; but at any age a vital capacity below 60% of the normal is significant, as is less than 75% of normal before the age of 50.

The diagnostic value of the vital capacity is enhanced if this measurement is made on the type of recording spirometer which is employed in the routine estimation of the basal metabolic rate. Such a record not only gives a measure of the vital capacity but can also be used to indicate the loss of elastic recoil in the emphysematous lung. I have discussed these tests in detail elsewhere (Christie, 1934; Meakins and Christie, 1934): they are based on the fact that when a normal individual takes a deep breath his lungs recoil passively to their original size because of their elasticity. In emphysema this recoil is abolished or impaired, and the lung has to be compressed by the muscles of expiration. After a full inspiration, therefore, the lung is seldom deflated to its original size when the patient is asked to expire forcibly. There are two other manifestations of loss of elasticity which can be demonstrated by this type of respiratory tracing: after a full inspiration the patient is incapable of deflating his lung as efficiently as after an inspiration of moderate depth, and the level at which the patient breathes is irregular.

During the past ten years I have performed this test on 66 patients with chronic bronchitis and dyspnoea on exertion: in 30 these characteristics were obvious and constant, in 26 the tracings were suggestive of loss of elastic recoil, and in the remaining 10 no abnormality could be detected. Of 116 controls, 11 would not co-operate, none showed definite loss of elasticity, and only 4 were suggestive of slight loss of elasticity. The main value of these respiratory tracings is that it is only patients with emphysema who consistently show loss of elastic recoil: admittedly this is true of only about 50% of cases, but most of the others give tracings which are suggestive. The drawbacks of this test are obvious. Except in hospitals where

the basal metabolic rate is measured by means of a recording spirometer, special equipment is required. The test has to be performed by someone with special knowledge of respiratory tracings, patience is required to ensure that the subject knows what is wanted of him, and I do not expect that this test will be used except perhaps by those who have a particular interest in emphysema.

It is easier to measure the chest expansion than the vital capacity, but unfortunately this also diminishes with age. In my experience about 60% of patients with emphysema have a chest expansion of less than one inch, but I have seen it reduced to half an inch in a man aged 63 in whom there was no other evidence to suggest pulmonary or cardiovascular disease.

In recent years the radiograph has been suggested as a reliable guide to emphysema. This has not been my experience. In 11 cases in which the diagnosis was confirmed at necropsy, radiographs suggested emphysema in only 5. In 25 other cases, in which diagnosis was made on clinical grounds, the value of the x-ray film was approximately the same.

A diagnosis of emphysema based only on physical signs is therefore unreliable, since these depend largely on the barrel-chest phenomenon, which may occur independently of this disease. In my opinion the diagnosis should only be considered certain when dyspnoea on exertion, of insidious onset, not due to bronchospasm or left ventricular failure, appears in a patient who has some of the physical signs of emphysema together with chronic bronchitis or asthma. The absence either of dyspnoea or of physical signs should cast doubt on the diagnosis, but should not exclude it; the more physical signs present in a patient with chronic bronchitis or asthma, the greater is the likelihood that he has emphysema. I must confess, however, that in the absence of dyspnoea I am always uncertain as to diagnosis and prognosis, but when dyspnoea of the type described above appears in a patient with chronic bronchitis I am very seldom in doubt. A large series of cases will have to be followed up over many years before the necessary criteria for early diagnosis can be established. Until this has been done I feel that the terms "emphysematous" and "emphysematous chest" should be discarded, as it is their use which has been partly responsible for the lack of progress in the understanding of emphysema since its classical description over a century ago by Laennec. These terms are quite misleading, and should be replaced by some such expression as "barrel chest" or "barrel-chest phenomenon," reserving the diagnosis of emphysema for those patients who have the symptoms as well as the signs of the disease. I feel that if this were done the chances of progress would be increased, particularly with regard to the use of special diagnostic procedures.

### Treatment

The treatment of emphysema is essentially symptomatic, as elastic tissue cannot regenerate and nothing can restore the structure of the lungs. Until heart failure supervenes, the only symptom, other than cough, is dyspnoea on exertion, and I will first emphasize the value of ephedrine. Although there may be no evidence of bronchospasm or resistance to respiration, the administration of ephedrine not infrequently relieves the dyspnoea of emphysema. A possible explanation of this effect is that the bronchioles leading to the over-distended air sacs and bullae are less capable of changes in calibre than those leading to healthier parts of the lung; bronchospasm, although not clinically manifest, would in this case increase the proportion of the inspired air deflected to these useless parts of the lung, and the relief of bronchospasm with ephedrine would improve the efficiency of ventilation and thus relieve dyspnoea.

Several procedures, the purpose of which is to deflate the lung, have been described, and it is said that these increase the efficiency of respiration. Pneumothorax is one, and relief of dyspnoea from this procedure, both in man and in horses suffering from this disease, has been claimed. More popular in this country, and less dangerous, are respiratory exercises designed to teach the patient to deflate the lung and to increase the use of the diaphragm. A well-fitting abdominal belt will also raise the diaphragm by increasing intra-abdominal pressure, and, more recently, pneumoperitoneum has been suggested for the same purpose. All these procedures have been recom-

mended, and various theories have been put forward to explain the beneficial effects observed. Two effects are common to most of them. First, the diaphragm is raised so that its convexity is increased and its efficiency therefore enhanced, and it was for this purpose that I first suggested the use of the abdominal belt. Secondly, the lung is deflated by these procedures so that it contains less air. The decrease in volume is, however, very small—so small that it can hardly be measured—and the beneficial effects are probably for the most part due to increased efficiency of the respiratory musculature. It is also possible that with greater collapse of the superficial bullae efficiency of ventilation may be increased.

When heart failure supervenes oxygen should be given, as the added insult of anoxia to a heart that is failing for other reasons greatly lessens the chances of recovery. Recovery from heart failure in emphysema is uncommon, but I have recently had a patient who recovered from two attacks, during both of which he was moribund. In the first oxygen was administered continuously for one week, and in the second for 10 days. He subsequently died during a third attack, and the diagnosis of emphysema was confirmed at necropsy.

The treatment of emphysema is thus far from being hopeless, although it is essentially symptomatic. Ephedrine should be tried in all cases. Respiratory exercises or an abdominal belt, or both, may increase considerably the tolerance to exercise. And lastly, when heart failure supervenes oxygen therapy is of the greatest value.

### Summary

In this paper the disturbance of function in emphysema, and its mechanism as revealed by experiment at the bedside, are emphasized, and the bearing of these clinical observations on the natural history of the disease and its diagnosis is discussed. The primary lesion is loss of elasticity, the most common cause of which is the stress and strain of cough or respiratory obstruction on the structures concerned in respiration, the process being comparable to the loss of elasticity which occurs in blood vessels following hypertension. Almost all the symptoms and signs of emphysema, and also the over-distension of air sacs and formation of bullae, can be explained on the basis of loss of elasticity, and it is suggested that it is the wastage of ventilation on this "pathological dead space" which is responsible for the dyspnoea and the impairment of haemo-respiratory exchange which occur. The difficulties and fallacies in the diagnosis of emphysema are described, and it is suggested that the present state of confusion would be diminished if the diagnosis were reserved for those who have symptoms as well as signs of this disease.

### REFERENCES

- Anthony, A. (1936). *Verh. Dtsch. Ges. inn. Med.*, 48, 244.  
 Beitzke, H. (1925). *Dtsch. Arch. klin. Med.*, 146, 91.  
 Cabot, R. (1927). *Physical Diagnosis*, Baltimore.  
 Christie, R. V. (1934). *J. clin. Invest.*, 13, 295.  
 — (1936). *Quart. J. Med.*, 5, 327.  
 — (1939). *Edinb. med. J.*, 46, 463.  
 — and McIntosh, C. A. (1934). *J. clin. Invest.*, 13, 279.  
 — (1936). *Quart. J. Med.*, 5, 445.  
 Courmand, A., and Berry, F. B. (1942). *Ann. Surg.*, 116, 532.  
 Lassen, H. C. A., and Richards, D. W. (1937). *J. clin. Invest.*, 16, 9.  
 Davidson, M. (1936). *Proc. roy. Soc. Med.*, 39, 1315.  
 Hartwich, A. (1930). *Z. ges. exp. Med.*, 69, 482.  
 Hoover, C. F., and Gammon, J. E. (1915). *Arch. intern. Med.*, 15, 501.  
 Hurtado, A., Fray, W. W., and McCann, W. S. (1933). *J. clin. Invest.*, 12, 833.  
 — Kallreider, N. L., and McCann, W. S. (1935). *Ibid.*, 14, 94.  
 Kountz, W. B., and Alexander, H. L. (1934). *Medicine*, 13, 251.  
 Loeschke, H. (1928). *Handl. spez. path. Anat. Histol.* Berlin, 3, 612.  
 Meakins, J. C., and Christie, R. V. (1934). *J. Amer. med. Ass.*, 103, 384.  
 — and Davies, H. W. (1925). *Respiratory Function in Disease*, Edinburgh.  
 v. Neergaard, E., and Witz, K. (1927). *Z. klin. Med.*, 105, 51.  
 Paine, J. R. (1940a). *J. thorac. Surg.*, 9, 550.  
 — (1940b). *Ibid.*, 10, 150.  
 Peters, J. P., and van Slyke, D. D. (1931). *Quantitative Clinical Chemistry*, 2, Baltimore.  
 Rasmussen, R. A., and Adams, W. E. (1942). *Arch. intern. Med.*, 70, 379.  
 Roelsen, E. (1938). *Acta med. scand.*, 95, 452.  
 Tendelen, N. Ph. (1925). *Allgemeine Pathologie*, J. Springer, Berlin.  
 Thies, O. (1932). *Virchows Arch.*, 204, 796.

The Trustees of the Nuffield Provincial Hospitals Trust have set aside a substantial sum for grants towards the establishment of preliminary training schools for nurses for the benefit of groups of hospitals, both voluntary and municipal. Schemes will be considered from Regional and Divisional Hospitals Councils or other joint hospital bodies recognized by the Trust. For areas in which these bodies do not exist, the Trustees have agreed to receive schemes through the appropriate area committee of the British Hospitals Association, but they must cover facilities for local authority as well as voluntary hospitals.

## INFANT FEEDING IN RELATION TO MORTALITY IN THE CITY OF BELFAST

BY

JAMES DEENY, M.D., M.Sc., F.R.C.P.I.

AND

ERIC T. MURDOCK, B.Sc., Ph.D., A.I.C.

(Lurgan)

In the course of a recent study of the infant mortality problem in Belfast we have collected some facts relating to infant feeding. For this city the death rate of children under 1 year has been high, and during the past four years has ranged from 85 to 122 per thousand live births. In the survey data were obtained concerning 554 deaths, or 84% of the total deaths of legitimate infants occurring from June, 1941, to June, 1942, in Belfast (completed by Dec., 1942). The total legitimate births in Belfast for this period were 7,778, 3,359 occurring in the first six months. Material was also collected from a group of children who had survived 1 year of life in the city. This control sample was established by selecting every fifth child born during the first six months of the period, and, allowing for wastage, finally numbered 477.

In order to maintain constant values the information was obtained by one investigator (E. T. M.) from a personal visit to the parent or guardian. Parents usually possess vivid memories of the circumstances of the death of their children, and were generally willing to discuss the matter. Cases were excluded when the fatal illness was due to hardships resulting from previous air raids, and when families had moved from the city and could not be followed up. Information was recorded concerning the size of the family (and previous infant deaths), income, housing, the care and feeding of the child, domestic hygiene, the ante-natal and obstetric attention, cause of death, the medical, nursing, hospital, and other factors relating to the fatal illness—entailing more than 40 questions in each case. In the control group somewhat similar data were obtained. This paper deals only with the information we have secured concerning infant feeding.

### Infant Feeding in Belfast

Feeding is an important factor associated with infant mortality, and in any examination of the problem a knowledge of the general character of the infant feeding practised is necessary. This subject was considered under three main headings—viz.: (1) the principal foods given to ordinary children for the first six months of life; (2) the food given for the second six months; and (3) foods the infants received before the fatal illness. It is obvious that this method of inquiry does not yield results in great detail, but it will present a fairly accurate picture of the main methods of infant feeding used in the city.

TABLE 1.—Analysis of Feeding of Infants in the Control Group, during the First Year of Life

Method of Feeding	Aged 0-6 months	Aged 6-12 months
Breast-fed (with or without "supplement")	337 (71%)	157 (33%)
Cow's milk	61 (13%)	33 (7%)
Dried proprietary milk	40 (8%)	19 (4%)
Cereal foods	39 (8%)	58 (12%)
Cereal and "mixed feeding"	—	68 (14%)
"Mixed feeding" and cow's milk	—	142 (30%)
Total	477 (100%)	477 (100%)

For the children in the control group, which is representative of living children in Belfast, we found (see Table 1):

1. During the first six months almost three-quarters received breast milk, with or without a "supplement," as the principal food. Of the remainder, a slightly larger proportion were fed on cow's milk than on cereals or dried proprietary milk.

2. During the second six months the same children showed a change in diet, with a decrease in breast-feeding. Only one:



third received breast milk, another third were given "mixed feeding" and cow's milk, and the remainder were fed on such diets as cow's milk alone, dried proprietary milk, or cereal foods with or without "mixed feeding."

3. *The major feeding before the fatal illness* was studied in the mortality group, as we thought that this would give most information on the relation of feeding to mortality. From this, and by relating the figures obtained to the age at death (Table II), it was found that the feeding followed the general

TABLE II.—*The Major Feed before the Fatal Illness Classified according to Age at Death*

Feeding before Fatal Illness	Age at Death						Total
	Under 7 days	1-4 wks	4 wks-2 mths	2-5 mths	5-6 mths	6-12 mths	
Breast-fed (with or without "supplement")	2	2	29	21	23	24	126
Cow's milk	—	5	20	23	47	36	131
Dried proprietary milk	1	7	6	9	26	20	74
Cereal foods	—	—	—	4	12	20	38
Other methods	—	—	1	—	—	1	2
Total	3	41	56	57	108	106	371
Congenital or premature cases not affected by feeding	133	44	6	—	—	—	183
Total	136	85	62	57	108	106	554

trends experienced in such groups—i.e., the amount of breast-feeding diminished as age increased, with a correspondingly greater use of the other foodstuffs. Age of death seemed to be the major factor influencing the manner of feeding before the fatal illness.

#### Incidence of Breast-feeding

Nowadays so many babies receive supplements that it was thought advisable to use a broader definition of breast-feeding. Consequently, in the following consideration of the duration of breast-feeding the infant was classified as breast-fed if the major part of its diet was breast milk.

It is apparent that there is a substantial difference in the extent of breast-feeding between the mortality and control groups (Tables I and II). These findings cannot be directly compared, as the same aspects of feeding were not considered in the two groups. However, figures giving a simple comparison can be obtained from our data by determining the percentage of babies breast-fed at various ages. In the mortality group the percentage breast-fed was based on the number of infants alive at these ages, and was found by relating the duration of breast-feeding to the age at death as in Table III. This table also gives the duration of breast-

TABLE III.—*Number of Infants who Died classified according to Duration of Breast-feeding and Age at Death, and Number of Infants who Survived (Control Group) classified by Duration of Breast-feeding*

	Mortality Group (Dead Children)							Control Group (Living Children)	
	Age at Death								
	Under 1 day	1-7 days	1-4 wks.	4 wks., 2 mths.	2-3 mths.	3-6 mths.	6-12 mths.		Total Deaths
Unsuccessful attempt to estab- lish breast-feeding	—	9	6	1	—	5	4	25	14
Died before breast-feeding could be established	67	27	—	—	—	—	—	94	—
Not breast-fed	—	19	40	21	23	22	18	143	30
Breast-fed for:									
Less than 1 month	—	14	39	11	9	26	22	121	74
1 mth. but less than 2 mths.	—	—	—	29	7	17	7	70	35
2 " " "	—	—	—	—	18	11	3	32	33
3 " " "	—	—	—	—	—	27	18	45	50
4 " " "	—	—	—	—	—	—	—	50	56
5 " " "	—	—	—	—	—	—	—	—	—
6 " " "	—	—	—	—	—	—	—	—	—
9 months and over	—	—	—	—	—	—	—	—	—
Total	67	69	85	62	57	108	106	554	477

feeding for the control group. At 1 month of age three-quarters of the children in the control group were breast-fed. Of the infants in the mortality group, at 1 month only one-half were breast-fed—a striking contrast. The proportion breast-fed is considerably less at each month of age in the mortality group

than in the control group (Table IV). Despite the smallness of the numbers in the sample this conclusion is decisive.

TABLE IV.—*Comparative Incidence of Breast-feeding in Infants who Died and in those who Lived*

Age of Child in Months	Numbers Living		Numbers Breast-fed		Percentages Breast-fed	
	Mortality Group	Control Group	"M" Group	"C" Group	"M" Group	"C" Group
1	333	477	171	359	51	75
2	271	477	101	324	37	68
3	214	477	70	289	33	61
6	106	477	24	206	23	43
9	—	477	—	156	—	33

Duration of the fatal illness of infants in the mortality group does not account for a significant part of the difference between the mortality and control percentages of breast-feeding at each age; a special analysis shows that of the 333 in the mortality group who survived one month, 60% of whom 40% were breast-fed—were sick at this age, leaving 273 who were still healthy. Of the latter, the number breast-fed was 147, or 54% of the total not sick. Thus the omission of sick children from the mortality group only increases the percentage of breast-fed babies from 51 to 54, and this is still very significantly different from the 75% of breast-fed observed in the controls.

#### Social Factors and Incidence of Breast-feeding

The possible influence of some social factors as a cause of the marked disparity between the incidence of breast-feeding in the mortality and that in the control group was studied: income, housing, and domestic hygiene were considered.

*Income* in relation to breast-feeding was analysed by dividing the infants of both groups into three different income grades. These were based on the amount, less rent, available to the mother for household purposes per head (including the child in question) per week. In the mortality group the amount reckoned was the weekly average for the month preceding the fatal illness. A similar average when the children were 6 months old was taken in the control group. The proportion of infants breast-fed in each income level, at various ages, was determined for the mortality and control groups, and the results show that the variations in income considered did not affect the measure of breast-feeding in either group.

*Housing*.—In ascertaining the effect of housing, the infants of the two groups were arranged in classes according to the number of persons per room in each house, and the proportion of children breast-fed in each class found.

*Domestic Hygiene*.—The influence of domestic hygiene was considered by dividing the homes of the infants into three grades: (A) very clean and showing maternal efficiency; (C) dirty or showing maternal inefficiency; (B) intermediate conditions. These analyses (Table V) show plainly that changing values in housing or domestic hygiene did not appreciably influence breast-feeding.

#### Order of Birth and Other Factors

*Order of Birth*.—This has an important effect on infant mortality, and on this account the possibility of a relationship between birth order and breast-feeding was examined. The infants in the mortality and control groups were classed according to this factor, and the incidence of breast-feeding determined in the classes for the various ages. While the figures obtained (Table V) may indicate vague trends relating breast-feeding incidence and birth order, statistical treatment shows that these tendencies are not significant for the numbers involved.

*Cause of Death*.—The incidence of breast-feeding was considered in respect of the following three causes: (a) gastro-enteritis; (b) respiratory infections; and (c) other causes. "Other causes" include prematurity and injury at birth—from the latter group only eight babies dying survived one month. The slightly lower incidence of breast-feeding among infants dying from gastro-enteritis (Table V) is not statistically significant, and could be ascribed to chance variation.

*Occupation*.—As very few of the mothers were engaged in industry this factor was neglected. Any attempt to establish vocational grades based on the occupation of the father failed owing to the number serving in the Forces.

The age of the mother was not sought. It was considered that the numbers in the samples would not be sufficient to give a satisfactory analysis for the necessary age groups. (See Campbell, 1929; Burns, 1942.)

#### Statistical Note

In Table V the figures relating the factors to the incidence of breast-feeding at 1 month and at 2 months of age are given. Results at 3 and 6 months furnish the same conclusions, but are not included in the table. A number of "sorts" for each social factor were

Of the former 51% were breast-fed at one month, while 75% of the latter were breast-fed at that age. This result is in agreement with the finding of Grulee *et al.* (1934) that the infant mortality rate is much higher in artificially fed children.

Our results show that the social factors of income, housing, and domestic hygiene have no significant influence in determining the extent of breast-feeding in either the mortality or the control group. This endorses the biological nature of the process of breast-feeding. The investigation of the effect of order of birth or cause of death on breast-feeding revealed

TABLE V.—Incidence of Breast-feeding at Ages of 1 Month and 2 Months related to Various Factors

		1 Month				2 Months			
		Numbers Breast-fed		Percentages Breast-fed		Numbers Breast-fed		Percentages Breast-fed	
		Mortality Group	Control Group	"M" Group	"C" Group	"M" Group	"C" Group	"M" Group	"C" Group
(i) Income less rent per head per week	Under 10s. . . . .	75	85	61	77	51	74	43	67
	10s. and under 15s. . . .	52	118	65	75	27	114	35	72
	15s. and over . . . . .	44	156	48	75	23	136	31	65
(ii) Housing: Number of persons per room (including the child in question)	Less than 1 . . . . .	30	96	62	75	14	85	37	66
	1 but less than 1½ . . . .	57	158	47	77	34	142	33	69
	1½ and including 2 . . . .	38	67	49	77	24	63	39	72
	More than 2 . . . . .	46	38	53	68	29	34	43	61
(iii) Domestic hygiene	Condition A . . . . .	56	165	47	76	29	150	31	69
	Condition B . . . . .	86	157	65	75	51	140	41	67
	Condition C . . . . .	29	37	48	71	21	34	40	65
(iv) Order of birth	First births . . . . .	55	133	56	73	33	118	43	64
	Second births . . . . .	28	69	49	71	14	61	29	63
	Third births . . . . .	30	51	48	82	16	46	30	74
	Fourth and fifth births . . .	22	58	46	82	13	55	33	77
	Sixth births and others . . .	36	48	54	75	25	44	45	69
(v) Cause of death	Diarrhoea and enteritis . . .	44	—	48	—	25	—	33	—
	Respiratory infections . . .	63	—	55	—	41	—	39	—
	Other causes . . . . .	63	—	52	—	35	—	38	—

involved in calculating these figures. The standards of the social factor were related (a) to the age at which breast-feeding ceased, and (b) to the age at death. From analysis *a* the number of children in the standard classes of the social factor at each month of age was determined, and analysis *b* gave the total number of children alive in the standard classes at these ages for the mortality group.

The significance of the figures in this table was tested by a  $\chi^2$  analysis. All differences from the expected figures for a "no relationship" consideration may be ascribed to chance. For each analysis, *P* is greater than 0.3—except in the case of birth order in the control group, when, with  $\chi^2 = 11.8$  and  $n = 8$ , *P* is between 0.2 and 0.1.

#### Comment

In the first part of this paper it has been shown that three-quarters of the children who had survived one year in Belfast were principally breast-fed, with or without a supplement, during the first six months of life. Of the small numbers of these children not breast-fed less than one-third were fed on cereal foods—the remainder received dried proprietary milk or cow's milk. For the larger part of the second six months one-third were breast-fed. This analysis of the feeding methods employed takes into account only the nature of that feeding. Such important considerations as the quality, quantity, or nutritive value of the foods could not be examined. Assessing the feeding practised in the city by the prevalence of breast-feeding or by the nature of the artificial foods given, the infant feeding in general use can be considered as adequate. This conclusion is supported by the finding, previously reported, that the incidence of gastro-intestinal and respiratory infections in the control group is low, although these two diseases are the cause of 42% of the deaths in the mortality group (Deeny and Murdock, 1943).

Even if the wider definition of breast-feeding employed in this study is taken into account the figures obtained for the control group show an incidence of breast-feeding in Belfast comparable to that of similar groups in other cities with a lower infant mortality rate. In addition a greater proportion of infants are breast-fed for a longer time (Blessing, 1937; Spence, 1938; Robinson, 1939; Hughes, 1942).

The study reveals a marked difference in the incidence of breast-feeding between the infants who die and those who live.

no appreciable relation. The consistency of these findings is noteworthy. No statistical relationship could be demonstrated throughout the subdivisions of each factor considered, either in the mortality or in the control group.

From the data it has not been possible to determine any further relation between the incidence of breast-feeding and mortality than that shown. However, it is interesting to consider the significance of this lowered incidence of breast-feeding in the mortality group. Would an increase of breast-feeding in this group reduce the mortality rate appreciably? We suggest that it would not, and that this lowered incidence of breast-feeding should be regarded more as an effect than as a cause of unsuccessful reproduction.

#### Summary

Facts concerning infant feeding obtained in a study of 554 deaths (84% of the total) occurring in one year in Belfast, and in a control group of 477 living infants, are presented.

The extent of breast-feeding in the infants who died was much less than in the control group.

The factors of income, housing, domestic hygiene, order of birth, and cause of death are shown to have no appreciable influence on the extent of breast-feeding in Belfast.

A statistical treatment of the results is given.

This work is a portion of a study of the infant mortality problem in Belfast which is being presented to the Statistical and Social Inquiry Society of Ireland. We wish to thank the Medical Research Council of Ireland for its generous assistance. We are grateful to the Director, the Senior Statistician, and Staff of the Statistical Branch of the Department of Industry and Commerce, Eire, for machine compilation of the data and technical advice, and appreciate their courtesy and kindness.

#### REFERENCES

- Blessing, R. (1937). *J. Pediat.*, 10, 792.
- Burns, C. M. (1942). "Infant and Maternal Mortality." University of Durham.
- Campbell, J. (1929). Ministry of Health Reports on Public Health and Medical Subjects, No. 55, London.
- Deeny, J., and Murdock, E. T. (1943). *Ulster med. J.*, 12, 117.
- Grulee, C. G., Sanford, H. N., and Herron, P. H. (1934). *J. Amer. med. Ass.*, 103, 735.
- Hughes, E. L. (1942). *British Medical Journal*, 2, 69.
- McNeil, C. (1942). *Ibid.*, 2, 271.
- Robinson, M. (1939). *Arch. Dis. Childh.*, 14, 259.
- Spence, J. C. (1938). *British Medical Journal*, 2, 729.

## AN UNUSUAL CASE OF CEREBRAL MALARIA

BY

CHARLES S. D. DON, M.D., M.R.C.P.

Temp. Major, R.A.M.C.; Medical Specialist

AND

P. F. MEYER, M.D.

Captain, R.A.M.C.; Graded Physician

This case is reported because of the large number of parasites in the blood film and the severe clinical signs, in spite of which recovery followed.

## Clinical History

The patient, a soldier aged 22, was admitted to a C.C.S. in North Africa on July 10, 1943. We subsequently learnt that while on local leave in North Africa he became ill, but attributed the illness to the heat and did not consult a medical officer. He had no clear memory of how he reached this C.C.S.; he last remembers travelling in a train with other soldiers, who finally took him to the central M.I. room of this area.

He was admitted late at night, about five or six days after the onset of the illness. On examination he complained of headache and vomiting. He was drowsy but not unconscious, and could answer questions reasonably well. The temperature was 102.4° F. The spleen was easily palpable. The urine was of normal colour. Blood slides showed a very heavy malarial infection. The thick film was crowded with parasites. Examination of the central parts and the edges of the thin film revealed that, on an average, 35% of the red cells contained parasites. Of the infected cells 82% had one ring, 17% had two rings, and 1% had three or four rings per cell. Several crescents of *Plasmodium falciparum* were also seen.

He was given 10 gr. of quinine dihydrochloride in 20 c.c. of water intravenously and 12 gr. by mouth at 11.30 p.m., the latter dose being repeated in six hours. Next day his condition was only fairly satisfactory; he was still drowsy, but he took 10 gr. of quinine six-hourly by mouth without vomiting. The temperature remained normal all day. A blood film showed large numbers of parasites to be still present. He took fluids fairly well, but passed only very small amounts of urine.

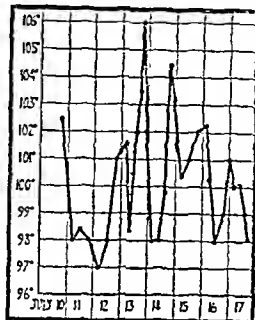
Early on the morning of July 12 the patient was found to be quite unconscious, cold, and collapsed. The tongue was hard and dry. The temperature was 97° F., the blood pressure 80/60, and the pulse 90 per minute. Hiccup was present, and breathing was shallow. As the patient appeared to be dying he was given an immediate injection of nikethamide (coramine). No urine had been passed since the previous night and the bladder appeared to be empty, but when a catheter was passed an ounce of urine was obtained which contained albumin but no blood. Microscopically, granular and hyaline casts were seen. A glucose-saline drip was put up, and by this route he was given in the course of the day 30 gr. of quinine dihydrochloride and two blood transfusions, each of 500 c.c., without a reaction of any kind. The patient was Group B, and each donor was of this group. The serum and red cells of the patient and of each donor were cross-matched and the results read microscopically at the end of one hour. A blood film of the patient showed large numbers of parasites to be still present. The haemoglobin before the transfusion was 70% (Sahli). By evening his condition had improved; the B.P. had risen to 105/80, and the temperature was 101° F. No urine was passed that day.

The following morning—July 13—the patient was semiconscious, and was able to take fluids by the mouth. The temperature was normal, the conjunctivae showed slight jaundice, and a specimen of urine voluntarily passed was typical of that seen in blackwater fever. Spectroscopic examination revealed the presence of oxyhaemoglobin. No red cells were seen in the centrifugized deposit, but granular and hyaline casts were present. While the compatibility of the transfused blood appears to have been established by indirect grouping and careful direct cross-matching, the possibility remains that the haemolysis observed was not due to quinine but to antibodies in the recipient's blood which could not be detected by the methods at our disposal. There was no history of any previous blood transfusion. The intravenous drip was continued; no further quinine was prescribed, and the patient was given by mouth one drachm of sodium bicarbonate hourly to alkalize the urine rapidly. In the course of the day he was given two intramuscular injections of mepacrine methanesulphonate (atebrin musonate), each of 0.1 g., and the urine gradually returned to a normal colour. At 6 p.m. the temperature was 103.6° F.; he was given mepacrine hydrochloride (atebrin) 0.1 g. by mouth, and this was repeated in 6 hours. At 9 p.m. the temperature, which had been taken hourly, had risen to 106° F., and the patient, after having remained semiconscious all day, became delirious and restless. Cold sponges were given half-hourly until 11 p.m., when the temperature had fallen to 102° F.

The intravenous drip was stopped, as oedema of the sacrum was found to be present; he was passing urine freely.

On July 14 the patient's general condition was much improved; for the first time he was quite conscious and rational. The morning temperature was 98° F. A blood film showed no parasites; the red cells exhibited a marked degree of macrocytosis, and megaloblasts were present. The urine still contained albumin and casts. Mepacrine hydrochloride was continued in a dosage of 0.1 g. i.d.s. That evening the temperature rose to 104.8° F.

On July 15 his general condition was better, but he was found to have thrombophlebitis of the left axillary vein (this arm was used for the drip) with oedema of the forearm and hand. The morning temperature, which so far had always been normal, was 100.4° F.



Temperature chart of the case.

There were rales over the lower lobes of both lungs but no dullness. It was decided that he had a hypostatic pneumonia, and was put on sulphadiazine 1 g. four-hourly. The temperature reached 102° and 101° F. on the next two nights, and thereafter settled, remaining normal all day on July 21. By this time the lung signs had disappeared.

## Summary

A case of cerebral malaria is reported in which 35% of the red cells were infected by one or more parasites of *Plasmodium falciparum*.

The most-pronounced cerebral symptoms came on after the patient had been on large doses of quinine for 36 hours.

Transient haemoglobinuria followed 30 gr. of intravenous quinine and two blood transfusions.

Hyperpyrexia was found to be developing after three days of intensive quinine treatment.

Hypostatic pneumonia complicated recovery.

We wish to thank Major-Gen. E. M. Cowell, the D.M.S., North African Force, for permission to submit this report for publication.

## EFFECTS ON RATS OF PROLONGED FEEDING WITH THE STAPLE AFRICAN DIET

BY

JOSEPH GILLMAN, D.Sc., M.B.

(From the Department of Anatomy, University of the Witwatersrand, Johannesburg)

It is known from numerous surveys and observations that pulmonary tuberculosis and other diseases of the respiratory tract are especially prevalent among the Africans (South African negroes). It is also common knowledge that cirrhosis of the liver and especially primary cancer of the liver are very often encountered in this people. In an extensive investigation into the incidence of cancer in South Africa, Berman (1940, 1941) has shown that in a series of 253 cases of cancer of all organs in adult male Africans working in the Witwatersrand gold mines no fewer than 222, or 90%, were primary in the liver. This remarkable state of affairs is even more strongly emphasized when it is remembered that liver cancer is the rarest neoplasm in Europeans.

Several factors are regarded as contributory to this high incidence of cancer, one of which is cirrhosis, which is almost invariably associated with liver cancer. There is a considerable body of opinion which regards this susceptibility to liver cancer

in the pigmented peoples as due to some racial factor. Des Ligneris (1940) has shown that extracts from the cancerous and non-cancerous livers of Africans are capable of producing neoplasms of the skin when painted on the backs of mice. The extracts from normal Europeans are said to be less potent in this respect. A similar experience has been reported by Hieger (1940).

### Effect of African Diet on Rats

Malnutrition among the Africans is widespread in South Africa. The overwhelming majority feed on a diet consisting largely of maize meal (mealie pap) and sour milk. This forms the staple from the time of weaning throughout life. Before invoking a racial or a genetic factor in modifying the incidence of disease it seemed highly desirable to ascertain the effect of the African diet on normal animals. Accordingly 125 rats weighing from 40 to 50 g. were fed exclusively on mealie-meal porridge and sour milk. The mealie-meal porridge was concentrated to form a solid mass, while the sour milk was prepared from fresh milk allowed to ferment in a warm room. The animals received liberal amounts of this food. Apart from thinning of the hair over the abdomen and hind legs and roughening of the tail, no obvious signs of acute avitaminosis were recognized.

After 14 months 12 rats were killed and a full post-mortem examination was performed. The others are being studied biochemically. In all of those killed some degree of liver pathology was evident macroscopically. This varied from diffuse enlargement of the whole liver with obvious fatty change to a widespread nodular cirrhosis, the latter usually involving the left side of the liver. In one case there was complete atrophy of the left lobe, with enormous compensatory hypertrophy of the right lobe—so much so that the enlarged lobe extended almost into the pelvis. In this instance the remains of the left lobe could be seen as two small appendages of cirrhotic tissue.

In this series of rats it seemed that the liver first enlarged and underwent fatty changes and later cirrhosis supervened, or else complete atrophy of the affected lobes occurred, with corresponding enlargement of the right side. The heart was grossly enlarged, and in 9 cases one or both lungs showed recent or old-standing inflammatory lesions with areas of bronchiectasis or abscess formation. The fat in the mesentery, retroperitoneal, or subcutaneous regions was abundant. The skull was very much thickened, especially in the occipital region. The suture lines could be readily identified by the zones of great vascularity. The upper incisor teeth were particularly affected; many of them were broken, some fused, and others loose. The pituitary was enlarged, the thyroids were atrophied, and the suprarenals were small and of greyish colour. In four cases the lymph glands of the peri-oesophageal region and above the lesser curvature of the stomach or above the abdominal aorta were of dark-brown colour, due to the presence of haemosiderin. The jejunum in those cases of advanced cirrhosis contained a dark viscid material which gave the reaction of blood. It is noteworthy that although many thousands of rats were examined post mortem over a number of years no lesions in the liver of the kind described above were ever observed.

### Comment

The significant features of this feeding experiment in rats are the gross pathology in the liver, the frequency of lung lesions, the enlarged heart, the abundance of adipose tissue, the thickened skull, and the dental affections, all of which occurred without any recognizable manifestations of acute vitamin deficiency.

The production of liver damage by means of a diet which forms the staple of the overwhelming number of Africans in South Africa is not without its sociological implications. It may also have repercussions in other parts of the world where economically impoverished individuals are forced to live on a diet similar to that of the African in the Union of South Africa.

This investigation was carried out in the Department of Anatomy, and all facilities were generously provided by the University of the Witwatersrand, Johannesburg. This and subsequent aspects of the problem represent, and will represent, the collaborative efforts

especially of Dr. Leon Golberg of the South African Institute for Medical Research, and of Christine Gilbert, Dr. Theodore Gillman, Joyce de Bruijne, Marianne Cassirer, and Joel Mandelstam of the Department of Anatomy. The work is proceeding actively to discover the factors responsible for the lesions produced experimentally in the rat.

### REFERENCES

- Berman, C. (1940). *S. Afr. J. med. Sci.*, 5, 54.  
 — (1941). *Ibid.*, 6, 145.  
 Des Ligneris, M. J. A. (1940). *Amer. J. Cancer*, 39, 489.  
 Hieger, I. (1940). *Ibid.*, 39, 496.

## Medical Memoranda

### Periarthritis Nodosa diagnosed Clinically

Following on the annotation on periarthritis nodosa published in the *British Medical Journal* of May 15, 1943 (p. 608), this case record may be of interest.

### CASE HISTORY

A woman aged 34 was admitted to the Meath Hospital under my care in June, 1942, complaining of "asthma" for the past week. Previous to this attack she had never suffered from asthma or bronchitis or from any other serious illness. On admission her temperature was normal and her pulse rate 118. There was evidence of acute bronchitis, but otherwise physical examination revealed nothing abnormal. A chest radiograph was negative. The urine contained some albumin on admission, but no casts at any time. Investigation for protein sensitivity to foods, flowers, and animal emanations was negative. During her stay in hospital her temperature was occasionally slightly elevated, and her pulse rate after the first week settled down to 80. After a period of five weeks in hospital, during which time she was treated on general lines, the patient went home feeling fairly well.

In Sept., 1942, she began to have further attacks of asthma, for which she was treated with a stock vaccine by her general practitioner, who stated, however, that even a small dose of the vaccine often gave her quite a severe general reaction; and finally the treatment had to be abandoned. Shortly after this she got a thrombosis of the right long saphenous vein, which gave rise to fever at night-time. She recovered completely from the thrombosis, but in Nov., 1942, started to complain of extreme general weakness and malaise and a raised evening temperature. A blood culture done at this time was reported to contain *B. proteus*, but this was considered to be a skin infection. Owing to the presence of petechial haemorrhages on the chest and back, a blood examination was also carried out, with the following results: R.B.C., 4,100,000 per c.mm.; W.B.C., 26,000 per c.mm.; Hb, 65%; colour index, 0.8; platelets, 110,000 per c.mm. Differential count: polymorphonuclear leucocytes 85%, lymphocytes 12%, large mononuclears 3%. Prothrombin clotting time, 35 seconds.

The patient was readmitted to hospital with a temperature of 99° and a pulse rate of 96. On examination this time, in addition to her chest condition she had a very loud grating to-and-fro pericardial friction rub, heard all over the precordium, but the heart sounds underneath did not appear to be altered. There was abundant albumin in her urine, and a catheter specimen revealed pus, red cells, and granular and hyaline casts. Her blood urea was 36 mg. per 100 c.cm. She was put on a nephritic diet. During the first week her temperature rose until it touched 103°, and her pulse rate became elevated to 120. At this stage she was treated with sulphathiazole (0.5 g. q.q.h.), but this gave rise to severe vomiting within the first 24 hours, and was discontinued. A second blood culture done a week after admission grew a staphylococcus—possibly also a skin infection—but the patient was started immediately on large doses of sulphadiazine, and during the next three weeks she received two courses each consisting of 25 g. Repeated white cell counts were done to check sulphonamide treatment; in the course of these a leucocytosis of 42,000 per c.mm. was recorded, with an eosinophilia of 9%. A fortnight or so after admission all signs of pericarditis had gradually disappeared. During her second period in hospital the patient had several attacks of asthma. At times also transitory painful lumps of about the size of a grain of rice appeared on her scalp and eyelids, and remained for about three days. In the middle of December she developed an angioneurotic oedema of the right arm. A little later there was a definite ulnar neuritis of this arm. Throughout her stay her urine was loaded with albumin, and casts were always present—granular, hyaline, and fatty. Her blood urea at all times remained within normal limits. She was discharged at the end of February at her own request.

Shortly after her return home she developed oedema of the legs, which gradually became a generalized oedema associated with ascites. During this time her urine on boiling became almost solid with albumin. In April, 1943, she had painful subcuticular lumps of about the size of a rice grain on the anterior surface of her forearms. Bullae then developed around each lump, and after from four to five days these burst, leaving punched-out crater-like ulcers with bluish-purple margins. At the same time the fingers, especially those corresponding to the ulnar distribution of the right hand, became blue, and dry gangrene ensued. The toes also became blue, but to a less degree. The patient's condition thereafter deteriorated rapidly until, about three weeks before death, the ulcers had coalesced to

form deep gangrenous excavations between the bones of the forearm, in which muscular aponeuroses could be seen. She required a great deal of omopon during the terminal stage of her illness to combat pain. On May 18, 1943, she died.

A post-mortem examination was unfortunately out of the question, and pathological confirmation is therefore lacking, but from the clinical course of the disease I think there is little doubt as to its true nature. Alternative diagnoses of rheumatic pericarditis, acute nephritis, septicaemia, and subacute bacterial endocarditis were all considered in turn as various signs arose, but none appeared entirely to satisfy the symptomatology. The appearance of nodules and the extensive patches of gangrene on the arms, together with the obvious signs of a vascular lesion of the extremities, suggested the true diagnosis.

I am grateful to many for their help in this case, but particularly to Dr. W. O'Donnell, Prof. W. J. E. Jessop, and the late Prof. W. Boxwell, as well as to my house-physicians.

Dublin.

CYRIL MURPHY, M.D., F.R.C.P.I.

### Tetanus following Appendicectomy

The following case seems to be worth reporting because it developed after an operation and was successfully treated without opening up the wound.

The patient was a well-built man aged 29, employed in the N.F.S. For two weeks before admission to hospital he had been complaining of pain and paraesthesia in the finger-tips of the right hand. A diagnosis of brachial neuritis had been made by a consultant physician.

He was admitted to hospital on June 6, 1943, with a typical history of acute appendicitis of 12 hours' duration. Operation was immediately performed, and an acutely inflamed appendix was revealed. The appendix was unobstructed and not perforated, and there was but little local peritonitis. A routine appendicectomy was performed without any unusual soiling of the peritoneum or abdominal wall with the contents of the appendix, the abdomen being closed without drainage. The operation was followed by an uneven recovery until the ninth day, except for slight pain in the hand due to the brachial neuritis. On that day the patient complained of an aching pain in the lumbar region. Examination revealed tenderness of the lumbar muscles, but no spasm. Further questioning disclosed that the ache had been present in a mild form on the sixth day. A diagnosis of lumbago was made.

On the tenth day after operation there was slight stiffness of the jaw, and examination of the lumbar muscles showed a slight but definite spasm. A tentative diagnosis of tetanus was made, and this was substantiated later in the day by the development of difficulty in swallowing. The patient also complained of the sensation of being periodically kicked in the back. This was presumably due to the onset of localized tetanic spasms. 180,000 i.u. of A.T.S. was immediately given intravenously, and chloral and potassium bromide, 20 gr. of each, were administered four-hourly.

The patient's condition deteriorated for the next two days, and he complained of tightness of the chest. Marked opisthotonos, abdominal rigidity, and trismus developed, but the bromide and chloral sufficed to keep the spasms local and infrequent. On the third day however, paraldehyde, 4 dr. twice a day per rectum, was required to control the spasms. Later the paraldehyde had to be given six-hourly in doses of 6 dr. to produce the required effect. Tribromethol was not used because of the increased liability to respiratory complications, and pethidine and chlorotone were found to be less efficacious than paraldehyde.

The fifth day, when several generalized spasms were experienced, was probably the worst day. Then improvement began with disappearance of the rigidity of the abdominal wall. On the seventh day 100,000 i.u. of A.T.S. was given. As the condition improved less-sedative drugs were needed. Nutrition was maintained at a fairly adequate level throughout with glucose and milky fluids, without having to resort to a stomach tube. It was very important to feed the patient rapidly and efficiently just before the next dose of sedative was due. Then he was just conscious enough to feed, and yet the trismus was reduced and swallowing did not provoke the onset of generalized spasms.

A bacteriological diagnosis of tetanus was not made. There was a slight purulent discharge from the wound, swabs from which revealed no evidence of tetanus bacilli. Their absence was probably due to the fact that a specimen could be obtained only from the superficial part of the wound. The wound was not explored.

There was no history of any injury, and the appendicectomy wound was the only possible focus for the growth of the tetanus bacilli. The catgut used at the operation was made by a reputable firm of manufacturers. When the tetanus became manifest it was not possible to trace the batch of catgut which was used and so test it for the presence of spores. Present-day catgut is an unlikely source of tetanus spores. It seems likely that the wound was contaminated by spores from the bowel lumen. It is stated by many authorities that tetanus spores are occasionally found in the lumen of the human bowel.

I wish to thank Mr. A. H. Southam for permission to publish this case and for his helpful criticism.

A. JOLLEYS, M.B., Ch.B.,

Surgical Registrar to Out-patients, Manchester Royal Infirmary.

## Reviews

### MENTAL GROWTH OF CHILDREN

*The Mental Growth of Children from 2 to 14 Years. A Study of the Predictive Value of the Minnesota Preschool Scales.* By Florence L. Goodenough and Katharine M. Mauter. (Pp. 130. 52.50 or 15s. 6d.) Minneapolis: University of Minnesota Press; London: Oxford University Press.

This is No. 19 of the series of monographs from the Institute of Child Welfare of the University of Minnesota. In it the results of repeated tests of the intelligence of the same children over a substantial period of time are described. The tests used are the Minnesota pre-school scales, revisions of the Stanford Binet and the Arthur performance scale, and the Minnesota College ability tests. At all ages the tests proved of predictive value. It was found that there is a good deal of inconstancy in the results of tests, especially in the early years, so that single tests are apt to be misleading and the longitudinal method here advocated would seem to be much more reliable. It proved difficult to follow many children through the whole 12-year period, but others of corresponding status were brought into the series, and the authors consider that their results are statistically valid.

Details of method and of results are given, and it would appear that individual mental growth does not always proceed at a fixed and uniform rate, though in the majority of cases constancy rather than inconstancy is the rule. Irregularity is most noticeable at early ages: there may be early precocity which does not last or early slowness with subsequent acceleration. Such irregularities are not necessarily due to external causes only. The old pre-school tests have not proved to be reliable, and new tests have been and still need to be worked out. The present study has shown that trustworthy indications of special abilities and differences of mental patterns can be detected at a much earlier age than was supposed. There is a suggestion that there may be a sex difference in the age at which mental tests begin to have a predictive value for future intellectual standing. It would appear that there is an initial feminine precocity which may be reversed later on. Further work is required and will be undertaken to amplify and confirm the findings.

This is a well-documented book with a useful bibliography at the end, and it will prove interesting and valuable to all who are concerned with the mental development of the child. The authors make it clear that there are many unsolved problems in the field of mental testing and that much work still remains to be done.

### THE HUMAN FOOT

*The Foot.* By Norman C. Lake, M.D., M.S., D.Sc., F.R.C.S. Third edition. (Pp. 452; illustrated. 15s.) London: Baillière, Tindall and Cox, 1943.

Mr. Lake's book has not undergone any drastic changes during his preparation of a third edition. The most significant changes are the closer attention given to those foot conditions which are seen more frequently in wartime, such as those associated with cold, damp, or excessive strains.

True frost-bite is stated to be a much rarer condition than trench foot, but with the present tendency to rapid movement in military tactics, compared with the more static methods in the last war, the incidence of trench foot is likely to fall. On the other hand, true frost-bite has become more common as the number of high-flying airmen increase. The reference to foot strain in industry and military service is important. Long hours of standing on a concrete floor bring many industrial workers to their doctors or to hospital, where this general excessive strain on a static foot is found to be a frequent cause of disability, though aggravated in many cases by more obvious deformities such as flat-foot. The soldier who complains of pain in the foot with no obvious cause may well respond to a more gradual introduction to "foot-slogging" than is customary.

Without doubt this is an exceedingly useful book for the doctor in general practice and the orthopaedic house-surgeon, and it should help the regimental medical officer to keep the Army soundly on its feet.



## TECHNIQUE OF PASTEURIZATION

*Pasteurization.* By Harry Hill, F.R.San.I. (Pp. 152, 10s.) London: H. K. Lewis, 1943.

Much has already been written about the public health aspects of pasteurization, and convincing evidence has been brought to show the need for heat treatment of milk in this country if a great deal of unnecessary disease is to be prevented. What is required now is a small book on the technique of pasteurization for the use of plant supervisors and operators, for medical officers of health and sanitary inspectors, and for laboratory workers in the public health field. The small volume by Mr. Harry Hill entitled *Pasteurization* goes some way towards meeting this need. The author sets out to convince the reader of the necessity for pasteurization, and then goes on to consider the various processes by which pasteurization of milk may be effected. Neither of these aims is achieved with complete satisfaction. The discussion on the public health aspect is too condensed to be convincing, and the description of pasteurization technique is too general to be of much help to those who already have some knowledge of processing but would like a great deal more. It is curious that the author should have attempted this part of his task without including a single diagram, chart, or photograph in the book, and only three tables. Everything is left to the reader's imagination—the appearance, size, and lay-out of pasteurizing equipment, the internal structure of rotary pumps and of plate and tubular heaters, the design of the different types of bottle-washing machines, the relation between temperature and creaming capacity, and numerous other practical points for which simple textual description is inadequate. However, for those who want merely a general idea of the methods by which milk is pasteurized the book will be found of value.

## Notes on Books

Mr. H. C. RUTHERFORD DARLING's handbook *Surgical Nursing and After-treatment*, first published 26 years ago, has now reached an eighth edition (J. and A. Churchill; 12s. 6d.). In his preface the author acknowledges the co-operation of his colleagues at the Prince Henry Hospital, Sydney, for many hints and suggestions in revising his text and bringing it up to date. Admittedly surgical nursing is best learnt by actual experience in a well-equipped modern general hospital; but practical knowledge needs reinforcement, and the purpose of this little book is to elucidate the details and to reduce the duties of a nurse to a state of orderly sequence, so that practice and theory may be integrated. Much of the information and guidance in its 660 pages will prove helpful to surgical dressers and practitioners, as well as to the nurses for whom it was written.

Two sanitary inspectors, Mr. H. HILL and Mr. E. DODSWORTH, have collaborated in preparing a handbook for public health students entitled *Food Inspection Notes* (H. K. Lewis and Co.; 6s.). It is designed as a brief guide to present-day knowledge of the subject, stripped of all superfluous matter, and within its limitations should prove useful for revision before the candidate takes his examination. The legal aspects of the matter are not touched on.

## Preparations and Appliances

## PLASTICS IN SPLINT-MAKING

Mr. JAMES P. CAMPBELL, M.B., F.R.C.S.Ed., deputy surgeon-in-charge, Harlow Wood Orthopaedic Hospital, near Mansfield, Notts, writes:

Splint-making is a craft which is as old as the medical profession itself and is one which has a wide appeal, as it affects the work of the general practitioner and specialist alike; none more so than the orthopaedic surgeon, for whom it is an integral part of his daily work. The use of any new material in splint-making is therefore bound to arouse interest even though it is still in the experimental stage. A final statement as to its durability cannot be made until it has been put to the test of time. Plastics in one or other of their many forms may prove a valuable addition to those materials already in use in splint-making.

Any material which is light in weight, is easily moulded, and which retains its shape when fashioned is worthy of a trial in the manufacture of splints. "Perspex" (methyl methacrylate)—one of the group of plastics—is such a substance which

has the added advantages of being non-absorbent, practically non-inflammable, and (so far as we know) non-irritant to the skin. It is as transparent as glass and casts no shadow, nor is there any distortion to x rays. In addition, it is tasteless and odourless and resists both acids and alkalis.

Perspex is supplied in sheets of varying size, and the sample under trial were 3/16 in. in thickness, but other thicknesses can be obtained. It can be cut and drilled when cold, but it is important to remember that bending and moulding can only be performed when it is in the plastic state, and this requires a temperature approximating that of boiling water. If attempts are made to bend it at too low a temperature it will crack, and cracks cannot be repaired, as one might imagine, by heating to the plastic state.

**General Principles.**—Perspex can be cut in simple shape with a hack-saw, but curves are more easily cut with a fine bladed fretsaw, and a little water will be found helpful when the saw is being used. Holes can be drilled with an ordinary drill such as that used in wood-work and metal-work. The edges can be rounded off with a file and if necessary smoothed with glass-paper or emery cloth. Moulding requires preliminary heating either in boiling water for two minutes or in front of a fire until the material becomes malleable. It can then be readily moulded to the desired shape, which must be retained until it is cool, and this may be hastened by immersion in cold water. Further adjustments in shape can be made by reheating. Simple curves can be moulded by hand, but the more complex forms require a cast similar to those used in making block-leather splints. Two pieces of perspex may be cemented together with diakon cement, which is perspex in liquid form. The edges must be clean and fit closely; the cement is brushed on one half and the other quickly applied; light pressure is maintained for 12 hours in a warm temperature to allow the cement to set. The splint may be polished with special polishes—No. 1 and No. 2—to remove minor scratches and to give a finish to it.

**Method of Splint Construction.**—In making a splint from perspex the pattern in paper is first drawn on the paper-covered perspex and then cut out with a fretsaw. The edges are rounded off with a file and glass-paper. The perspex is then heated evenly throughout its length over a stove until it is soft and plastic. It is then bandaged to a cast and immersed in cold water for 1/2 to 1 minute. This process is repeated until the desired shape is obtained. Small drill-holes are then made at the appropriate levels for the straps to retain the splint in position. Before finally fixing the buckles and straps the splint is polished.

Splints made from perspex have certain advantages over metal and leather splints. They are lighter and less conspicuous; they are more hygienic in that they can be removed and washed with soap and water; they require less labour in manufacture as the finishing is more simple and padding or lining is unnecessary. The material can be used over and over again by simple heating and remoulding.

Perhaps its most useful field will be in cases of anterior poliomyelitis, as the lightness of the splint is of great importance in this condition, particularly in childhood, and perspex fulfils this need. This also applies to some types of nerve injuries such as wrist-drop of radial nerve paralysis. A further group of cases in which perspex splints may have definite advantage is where soiling is liable to occur. This applies to corrective splints for the lower limbs in infants and young children in the treatment of the deformities of rickets and where splints are required in incontinent patients.

The cost of splints made from perspex, so far as this can be estimated, may well be less than that for similar splints in metal, as the material costs almost the same and time in finishing a perspex splint is much less than that required to line and finish a metal splint.



B. Whitehall (*Johns Hopk. Hosp. Bull.*, 1943, 73, 265) records a case of severe cerebral malaria due to *Plasmodium falciparum* in a soldier aged 25. Recovery followed the use of quinine intravenously. The urine and blood-pressure findings agreed with those of acute glomerular nephritis.

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## PULMONARY EMPHYSEMA

Pulmonary emphysema and its ally chronic bronchitis are two of the most distressing conditions with which a physician can be faced. The inexorable progress of the disease induces a despair in both patient and doctor, which the weary repetition of "mist. tuss. expect." does little to relieve. Many a physician thinks himself fortunate if he can divert such a patient to his houseman or to the casualty officer. So when a physician-physiologist turns his attention to such a chronic disease as emphysema, as Prof. R. V. Christie does in his Goulstonian Lectures published in this and last week's *Journal*, we welcome the brave attempt to throw new light on an old problem.

Laennec<sup>1</sup> gave the first detailed description of pulmonary emphysema. He considered the primary condition to be a bronchial catarrh which caused partial obstruction of the smaller bronchioles: as inspiration was a more powerful act than expiration, air tended to be trapped in the alveoli, which filled out and burst. Gairdner<sup>2</sup> and others, however, contended that the primary condition was some disease causing collapse or fibrosis of parts of the lung, which was followed in turn by distension of the remaining alveoli. Freund<sup>3</sup> and Loeschke<sup>4</sup> believed that spinal deformity and fixation of the chest in a position of inflation caused emphysema, and operations to correct this deformity were devised. Degenerative changes in the lungs, both vascular and nutritional, have also been called in to explain emphysema. A common assumption is that emphysema is associated with over-distension of the lungs, and many a student has treasured in his mind a picture of the purple-faced trombone player rending his alveoli in a mighty effort. But Christie states that the emphysematous lung only appears distended when seen at necropsy, because, unlike a normal lung, it does not collapse. He shows that the residual air in emphysematous subjects is increased only slightly, and that the lungs are often no more distended than normal lungs in moderate inspiration. As Christie has pointed out previously,<sup>5</sup> no man need hesitate to join a brass band for fear of emphysema.

Sir John Floyer in 1698 noticed that the emphysematous lung lacks elasticity. Writing of broken-winded horses in his *Treatise of the Asthma*, he described the "rupture and dilatation of the bladders of the lungs" so that "the air blown into any lobe will not be expelled thence by the natural tone of the muscles of the bladders." As Thomas Watson<sup>6</sup> commented nearly 200 years later: "Really this

is a capital piece of pathology for the seventeenth century." Loss of the normal pulmonary elasticity forms the basis of Christie's theory of the mechanism of emphysema; he considers it the most important abnormality in the emphysematous lung. He found the intrapleural pressure in several emphysematous subjects to be raised and often atmospheric, even at the end of inspiration. The elastic tension of the lung produces the normal negative intrapleural pressure, the abolition of which Christie takes as an indication of a loss of pulmonary elasticity. The weakened inelastic alveoli tend to dilate. The resulting enlargement is most noticeable close to the surface of the lung, where the pull of the chest wall and diaphragm is greatest: emphysematous bullae are commonly situated in this area. Expiration, as is well known, is largely a passive movement produced by the elastic recoil of the lung, and if this is abolished the chest would expand, owing to the overaction of the muscles of inspiration, thus producing the emphysematous deformity. Christie has shown that such expansion actually occurs when the pulmonary tension is abolished by an artificial pneumothorax.

The oxygen saturation of the arterial blood in emphysema is diminished in proportion to the severity of the disease and can be increased by giving oxygen (Meakins and Davies<sup>7</sup>). The ventilation in the lungs is therefore clearly deficient. The blood  $\text{CO}_2$ , on the other hand, is much increased and so is the alveolar  $\text{CO}_2$ ; this suggests that a free gaseous interchange can take place through the alveolar walls. What is the explanation of this diminution of the oxygen and increase of the carbon dioxide in the blood and alveolar air in emphysema? Defective respiratory mechanism does not cause it, for the volume of the tidal air is not decreased. Insufficiency of functioning lung causes decreased  $\text{CO}_2$  elimination as well as decreased  $\text{O}_2$  absorption: so this cannot be blamed. Nor can one blame poor ventilation of the alveoli from distortion of the terminal bronchioles: gaseous exchange is so quick that such a defect could not impair the exchange of gases. Christie's explanation is that the inspired air tends to be drawn into the dilated and avascular alveoli and bullae at the expense of the more normal alveoli, which come to depend almost entirely on diffusion for their ventilation. Such an unequal ventilation in emphysema would account for both the insufficient oxygenation of the blood and the failure to eliminate  $\text{CO}_2$  from the lungs. The dyspnoea is clearly due to the high blood  $\text{CO}_2$ , which even a much-increased bicarbonate reserve fails to prevent.

As to the actual cause of emphysema, Christie contends that the repeated strains on the alveolar walls during coughing or the obstructed breathing of asthma account for the loss of pulmonary elasticity. He draws attention to the almost invariable association of chronic bronchitis or asthma with emphysema, and to the fact that several workers have recorded increased alveolar pressures in these conditions. This theory, he admits, does not explain the occasional instances of emphysema in which there is no evidence of bronchial disease, but it helps to clarify much that was hitherto obscure. Nevertheless, the older theory of chronic obstruction will probably continue to have its supporters. As long ago as

<sup>1</sup> *Traité de l'Auscultation Médiate*, 1819.<sup>2</sup> *Mithy. J. med. Sci.*, 1849, 9, 242.<sup>3</sup> *Dtsch. med. Wschr.*, 1913, 39, 603.<sup>4</sup> *Handb. spec. path. Anat. Histol.*, Berlin, 1928.<sup>5</sup> *Edinb. med. J.*, 1939, 46, 363.<sup>6</sup> *Principles and Practice of Physic*, 4th ed., London, 1857.<sup>7</sup> *Respiratory Function in Disease*, Edinburgh, 1925.

1885 Brown-Séquard<sup>8</sup> noticed that when stimulation of the mid-brain produced bronchial spasm in a dog the alveoli dilated. This observation has since been confirmed, and it has been suggested that bronchial spasm may be present in all cases of emphysema, even when it is not clinically demonstrable. Kountz and Alexander<sup>9</sup> have shown that administration of adrenaline improves the vital capacity of patients with uncomplicated emphysema, as well as of those with bronchitis and asthma, thus supporting this suggestion. Chronic obstruction would also explain the intrapleural pressure changes. Christie, as Cabot,<sup>10</sup> Davidson,<sup>11</sup> and others before him, has found emphysema at the necropsy of patients who showed none of the classical signs of the disease during life. The barrel chest—the commonest diagnostic criterion—may also often be a postural deformity unassociated with emphysema. Of more value is the history of increasing dyspnoea on exertion in a chronic bronchitic or asthmatic.

A quick glance at these investigations might lead the practising doctor to think that they are largely of academic importance. But they point to three valuable methods of treatment which, though not new, are often neglected. Christie emphasizes once more the value of ephedrine—often very effective in relieving the dyspnoea of emphysema even when bronchial spasm is not evident. Respiratory exercises designed to improve diaphragmatic breathing and mobilize the lower chest are also most useful, especially in cases of marked thoracic deformity. Finally, Christie agrees with Kountz and Alexander in recommending the use of an abdominal belt which helps to raise the diaphragm. Application of these practical measures should ensure at least that the emphysematous patient leaves hospital with less dyspnoea, a more mobile chest, and a better-corseted abdomen.

### A NEW BRITISH JOURNAL

This week sees the publication of the first number of the *British Journal of Industrial Medicine*, whose advent was allded in these columns in an annotation a short while

<sup>12</sup> It owes its origin in the first place to that active group comprising the Association of Industrial Medical Officers, which was formed in 1935 to bring together medical men employed whole-time in various branches of industry so that they could pool their experiences and forward their common aims. As the editorial pen records, the new association got much valuable guidance from Sir Wilson Jameson, who was then dean of the London School of Hygiene and Tropical Medicine. The association grew rapidly and now has more than 300 members, to whom the new journal will mostly look for its inspiration and original work. The *B.J.I.M.*, which is being published from Tavistock Square by the British Medical Association, will, it is hoped, play more than a passive part in furthering knowledge in the field of industrial medicine. Its very existence should stimulate those whose professional work brings them into contact with industry to look at old problems with new eyes, to find fuller answers to

old questions, and to start asking new questions, the answers to which will come out in work that can with truth be described as original.

Although, like the other three special quarterly journals published by the B.M.A., the new quarterly is first and foremost scientific in nature, the list of contents of No. 1 shows that the Editors are not afraid to provide that good mixed diet held to be the height of nutritional excellence. This pleasant foretaste of editorial policy convinces us that the *B.J.I.M.* will appeal to a much wider audience than the relatively small number of men now engaged whole-time in industrial medical practice and research. As Lord Moran says in his most apt foreword, written in a style which has his hall-mark: "The firms that in bulk bear the main burden of the day are generally too small to have a whole-time works doctor. They will look for help to the general practitioner, and there is nothing in the nature of industrial medicine which is beyond the competence of a sound practitioner." Lord Moran agrees, of course, that special training is required for factory work and that an industrial doctor must be familiar with working conditions and industrial hazards: "But first and last he must be a good doctor. If he is, all the rest will be given unto him."

No. 1 of the *B.J.I.M.* can certainly give him a good deal. It starts off with an article by Prof. Major Greenwood entitled "The Evolution of an Industrial Society." The author in one sentence shows how much of what we may call "industrial medicine" is simply part and parcel of medicine as a whole: "Had our ancestors wholly neglected the evils of life in factories, left young persons without the protection of laws and inspectors, disregarded extra-domestic evils, *but rehoused the people* [our italics], I think the rate of mortality would have begun to fall a century sooner." In one sense, then, industrial medicine is domestic medicine writ large, as we are reminded by the inclusion in this issue of the *B.J.I.M.* of articles on heating and ventilation by Dr. T. Bedford, on nutrition and the industrial worker by E. H. Capel, on some foot faults related to form and function by Mr. W. Sayle Creer. Heating and ventilation and nutrition—housing and food—are after all the first problems of domestic medicine and of social medicine. Some aspects of these problems may well first be studied in the factory and the workshop, and the lessons learnt be applied afterwards to the home—the medical province, as we like to believe it, of the family doctor.

There are of course the special problems of industry, more especially those of toxicology, as the article by Alice Stewart and L. J. Witts on chronic carbon tetrachloride intoxication reminds us. But perhaps the largest scope for inquiry by the medical man who has a whole-time or part-time special interest in industrial medicine is provided by the study of the individual undergoing the various stresses and strains of any given environment. How, for example, will the woman whose overactive thyroid has been removed stand up to her job in the textile factory? The factory and the workshop also give the doctor and the welfare worker an opportunity to find out how people live and to give them that instruction in personal and communal hygiene which this war has so clearly shown to

<sup>8</sup> *C. r. Soc. Biol.*, Paris, 1885, 37, 354.

<sup>9</sup> *Medicine*, 1934, 13, 251.

<sup>10</sup> *Physical Diagnosis*, Baltimore, 1927.

<sup>11</sup> *Proc. roy. Soc. Med.*, 1936, 39, 1315.

<sup>12</sup> 1943, 2, 584.

be necessary. What can be done in the way of investigating health and disease in a large group of employed people is a lesson that we in this country have learnt from the Post Office Medical Branch, under its recent chief medical officer, Sir Henry Bashford, who saw this first number of the *B.J.M.* to press and who contributes an article to it on some aspects of sick absence in industry. His appointment as Medical Adviser to the Treasury made it impossible for him to continue in his post as Chief Editor, in which he was succeeded by Dr. Donald Hunter before the first number came to light. We would, however, like here to record that he has been the moving spirit behind this new venture. The last article in No. 1 is contributed by a distinguished representative of industrial medicine in the U.S.A., Dr. Orlen J. Johnson, who writes on medical service in industry in the United States. This shows that the new journal, though British, is not going to close its columns to articles from men working in other countries on the common problems of industrial medicine.

### AN INCREASE IN DIARRHOEAL DISEASES

Those who study the epidemiological tables of the *Journal* find almost every week something to stimulate their interest. Thus in the issue of Jan. 15 they noted with some excitement that notifications of diphtheria for the English great towns had dropped below 500 in the last week of 1943, which suggests that prophylactic immunization is already having an appreciable effect. On the other side of the picture, as the analysis on page 125 last week showed, is a recent increased incidence of scarlet fever, and—much more serious—a sharp rise in the war years of notifications of dysentery and of deaths from enteritis in children under 2 years of age. Indeed in 1943 more than three times as many children died of enteritis than of diphtheria in the large towns of England and Wales. It may be that a proportion of cases certified as dying of enteritis should be attributed to other causes, but this error is not likely to vary much from year to year, and does not explain the steady trend upwards of deaths from 1,812 in 1940 to 2,569 last year. An even more striking increase in the notifications of dysentery (from 2,843 in 1940 to 7,772 in 1943) can only partially be explained by a greater awareness and better diagnosis of this, now endemic, infection. These increases in diarrhoeal diseases at a time when the infant mortality rate is improving must give us pause.

Dysentery in this country is a mild disease of high infectivity, and if, as is often stated, its incidence reflects the standard of personal and public hygiene in the community we must suppose that there has been some falling-off in these standards since the war began. A variety of reasons suggest themselves: a great increase in communal feeding, the multiplication of day and residential nurseries, labour shortage interfering with the cleanly handling of food and milk (a number of milk-borne outbreaks of dysentery have lately been reported), and probably mass movements of troops and civilians. But we need also to consider if there has been some lowering in the host-resistance due to improper feeding or physical or mental fatigue. Dysentery is mainly spread by the contamination of food with soiled

fingers, but too often the mildness of the disease means that the culprit cannot easily be detected. Add to these missed cases the contact and convalescent carriers, now shown by selective culture media to be much more common than was formerly believed, and it is understandable how difficult a disease dysentery is to eradicate. Only a high standard of personal hygiene in the community, and particularly among food-handlers, will control its spread, and propaganda to this end is urgently needed. The Food and Drugs Act (1938) gives the M.O.H. new and wide powers in dealing with premises and personnel where food is sold.

Infantile diarrhoea, if less prevalent than dysentery, is a much more fatal infection, and ranks next to neonatal deaths and pneumonia as a cause of infant mortality. Its aetiology is complex, but its ravages could be largely prevented if a majority of mothers could or would breast-feed their babies for 6 to 9 months. Here again enlightened propaganda<sup>1</sup> and much concerted effort by family doctor, ante-natal and child welfare clinic, maternity department, and the mothers themselves would encompass a great saving of lives. While some 80% of mothers delivered in institutions and 95% of those confined at home breast-feed their babies for the first few weeks of life, the proportion has dropped to 50% or less at 3 months and 30 to 40% at 6 months. With a great increase in institutional midwifery much depends on the nursing staff of the maternity unit in establishing satisfactory breast-feeding, and no unit is doing its job properly that cannot discharge about 90% of wholly breast-fed babies. Too often, however, much painstaking effort in the maternity home is undone when the mother, returning after 10 days to the worries of a household, either cannot or will not continue with breast-feeding. In this she may be aided and abetted by her family doctor, who is sometimes too ready to recommend artificial feeding when a little encouragement and advice would ensure continuance of Nature's way. Nor are welfare clinics entirely blameless, especially when their posters proclaim the virtues of this and that brand of dried milk. It must not be forgotten, however, that infantile diarrhoea affects principally poor-class urban children, so that factors other than artificial feeding operate. For example, are the salvage campaign and the collection of pig-food, which helps to breed flies, a contributory cause of the greater prevalence in the war years? Is there a falling-off in the cleanliness of milk due to less careful handling and poorer distribution? Are children with minor digestive upsets too readily certified and too easily admitted to hospital, and is hospital cross-infection more prevalent because of shortage of nurses? Again, outbreaks of neonatal diarrhoea, with its appalling mortality, have been more common in recent years, and this infection, too, occurs mostly and in its severest form in bottle-fed babies. The attack on the whole problem of infantile enteritis seems to be along the lines of intelligent advice and propaganda for the mother about breast-feeding, more effort in maternity units to attain a 90% discharge of wholly breast-fed babies, and, most important, more help when the mother again takes up the onerous duties of housewife.

<sup>1</sup> See Rep. on Publ. Hlth. and Med. Subjects, No. 91: *The Breast-feeding of Infants*, 1943. (4d.)

### INFANT MORTALITY IN BELFAST

The most notable feature of the mortality experience of the present century is the decrease in infant mortality, which has fallen by two-thirds in England and Wales. Striking as this reduction is, much lower rates have been attained by some countries. Infant mortality in the large towns of Great Britain has lagged behind the country as a whole. That conditions of life in big cities need not be associated with a severe mortality risk to infants has been demonstrated in America, where very low rates have been recorded—e.g., in 1942 the infant mortality of New York was only 29 per 1,000. It is obvious that there is ample room for improvement in the British rates, and it seems to be within the bounds of possibility that infant mortality in large cities can be reduced to at least 25 per 1,000. The city of Belfast is unfortunate in having one of the largest infant death rates in the United Kingdom. The deaths of infants in this city have fluctuated from 1 in 12 to as high as 1 in 8 in recent years, and judging by existing standards about three-quarters of these deaths were preventable. To put it another way: over 500 babies die yearly who apparently could be saved. An investigation into the various aspects of this mortality in Belfast has been made by Deeny and Murdock.<sup>1</sup> The data comprised the deaths between June, 1941, and June, 1942, and a random sample of one-fifth of the children born in the first six months of this period who survived the first year of life. Premature birth and injury at birth accounted for one-quarter of the deaths; another quarter was due to respiratory diseases, and one-fifth to diarrhoea and enteritis. The environmental indices—income and housing conditions—were related to infant mortality: the former had the larger association, but rather surprisingly no significant relation could be demonstrated between dirty homes and mortality. The deaths from diarrhoea and enteritis and respiratory infections formed a larger proportion of the total infant deaths in the lowest income group than in the highest. An attempt was made to determine the adequacy of the medical attention by examining the individual cases. Medical aid was sought as promptly in the illness that ended fatally as in non-fatal sickness. The authors found that parents were quick to call in the doctor, and the poor secured medical attention as early as those who were better off. Nutrition is of first importance in the rearing of healthy children, and the relation of feeding to infant mortality is discussed by the authors elsewhere in this *Journal*. The proportion of breast-fed babies was lower among the dead than among those who lived. The proportion breast-fed was practically constant in both groups of infants for the subgroups of income per head, number of persons per room, domestic hygiene, and for order of birth and cause of death. These factors had no significant influence in determining the proportion of breast-fed babies, and no relation was established between breast-feeding and mortality. The authors conclude that an increase in the proportion of breast-fed infants would not lower the infant mortality, and that the smaller proportion found among the dead was an effect rather than the cause of unsuccessful reproduction.

### SURGICAL SCIENCE MOVES FORWARD

The Scientific Report of the Royal College of Surgeons of England for the past academic year makes cheerful reading. There is a record of painstaking care of the surviving material from the Museum scattered widely over the Home Counties. Shortage of staff and difficulties of transport can be understood by most, but the attention and skill needed to conserve material from the depredations of mice,

moulds, and men can only be appreciated fully by those responsible for the care of museums. It is encouraging to read of the plans made for collection of material in special fields by College representatives chosen for their interest in them. Donors have been numerous and their gifts many and valuable. The odontological collection of the Royal Society of Medicine has been given to the College as a contribution towards the future reconstruction of the Museum.

The College has decided on its future policy concerning the Museum. An opportunity is now presented to provide not only a unique collection of anatomical and pathological material but an educational instrument of untold value. Medical museums are essentially educational. The day has long passed when they were the repositories of the surgical triumphs of bygone surgeons and bleached specimens hallowed by a famous name. The historical value of the latter far outweighed their pathological interest. It is to be hoped that in the new Museum a place will be found for Hunter's specimens, a place where honour can be done to Paget and Lister and where specimens illustrating classical work will be on view. The greater part of the Pathological Collection it is hoped will grow into a national type-collection of pathology adequately documented with clinical histories and illuminated with histological detail—these for the specialist as his reference library. For the student who wishes to see pathological processes let us hope there will be a place. The anatomical series can never be reconstituted as Hunter formed it—a collection to illustrate the relation of form to function—but perhaps it will be possible to suggest somewhere the great idea which Hunter had and which was so fruitful both before and after Darwin. In this collection, too, the collections for the specialist will be necessary, and it is to be hoped that examples of superb prosectorial skill will be available for the student of human structure.

The Research Laboratories are obviously in battle dress. Experiments on the production of casein digests suitable for intravenous medication, the prevention of liver damage during antisyphilitic treatment, the treatment of infective hepatitis, and new surgical suture material are all of topical as well as of scientific interest. As reports on these various problems will soon be published they do not call for discussion here. More significant than the problems has been the way in which these laboratories and their staff have become responsible for a large-scale clinical experiment. It must be rare for a research laboratory to have available sixty hospital beds where new methods of treatment can be worked out (under proper supervision) and where there is continuous interchange of ideas between the hospital ward and the laboratory. A significant paragraph in the report states: "This year's work has made it abundantly clear that in future there should be available to those working in the laboratories easy access to a hospital ward which is dedicated solely to the study of disease. The constant stimulus which comes from team work is immeasurably facilitated by direct contact with and responsibility for the treatment of the sick." Perhaps in the near future some such research hospital might be established on or near the College site. With the existing Research Laboratories, and the imminent developments in the Department of Pathology close by, a research centre of unlimited usefulness would soon come to maturity.

We much regret to announce that Prof. W. W. C. Topley, M.D., F.R.S., late Director of the Division of Bacteriology and Immunology, London School of Hygiene and Tropical Medicine, died suddenly on Jan. 21, after attending a meeting of the Agricultural Research Council, of which he had been Secretary since 1941.

<sup>1</sup> *Ulster med. J.*, 1943, 12, 117; and *Infant Mortality in the City of Belfast*, Statistical and Social Inquiry Society of Ireland.



## Reports of Societies

### ORGANIZATION OF LUPUS TREATMENT

A joint meeting of the Sections of Dermatology and of Epidemiology and State Medicine of the Royal Society of Medicine was held on Dec. 16 to discuss the organization of the treatment of lupus vulgaris. Dr. A. C. ROXBURGH presided. The subject was introduced by Dr. F. S. AIRY, who said that there was no true conception of the incidence of lupus in this country, its distribution, the facilities available for its treatment, their adequacy, the extent to which those afflicted availed themselves of the opportunities for treatment, and the success of the measures adopted. He suggested an incidence of one case per 1,000 of population, which would mean 45,000 lupus sufferers, and would justify the establishment of local treatment centres. Just as public health authorities had tackled diphtheria, so propaganda should be used to persuade lupus patients to seek treatment at an early stage. Lupus was a sociological as well as a medical problem.

Sir HENRY GAUVAIN (in a paper read in his absence) said that there should be recognized accessible centres where cases of suspected lupus could be sent for diagnosis. Severe cases of lupus in children should be treated at a resident hospital school, and adults seriously affected, in colonies. Correspondence in the *British Medical Journal* had evoked enthusiastic testimony to the Finsen-Lomholt lamp. Its drawback was its expense. He believed that, Denmark being now in enemy hands, it would be legal to undertake the manufacture of the lamp in this country. But it was deplorable that Finsen treatment should have become a fetish.

Dr. A. BURROWS praised light treatment for its efficacy. Localized patches of lupus were ideally treated at Finsen light centres; more extensive cases could be successfully treated by light, but the applications might have to be protracted over a long period. It used to be said that lupus patients did not suffer from other forms of tuberculosis, but that idea had been exploded. In many cases the patients could carry on their ordinary lives while under treatment, but segregation was sometimes desirable. Segregation had the advantage of ensuring hygienic surroundings and aseptic dressings; its drawback was the psychological effect. The proper method of organization would be *ad hoc* centres with some residential accommodation for special cases over short periods. He thought that about ten centres in England would be sufficient.

#### Incidence of Lupus Vulgaris

Dr. F. R. G. HEAF said that lupus vulgaris was a comparatively rare condition. In the five years 1931-5, out of a total of 3,624 non-pulmonary tuberculosis cases treated at L.C.C. centres, 59 were of lupus of the skin. In 1938 in Lancashire 2,032 cases of all forms of tuberculosis were notified, of which 805 were non-pulmonary, and the skin cases of lupus numbered 26. On the Lancashire registers in 1942 the number of active cases was 191, and of quiescent cases 85. In Manchester in 1940 there were 15 new notifications and in 1941 17. As treatment was costly and called for a specially trained staff, it should be located in centres which served at least a population of 5,000,000. The establishment of such centres called for regionalization and for co-operation between local authorities. He estimated that there were annually about 10 new cases of lupus per 1,000,000 population, and that five beds per 1,000,000 were required, with out-patient facilities to treat approximately 50 cases per 1,000,000. If there was much disfigurement, permanent residence at an industrial settlement like Papworth would have to be considered when the activity of the lesion had been overcome.

Dr. HENRY MACCORMAC said that he was under the impression that tuberculosis of the skin was a notifiable disease, as were other forms of tuberculosis, and therefore there should be official records of the number of cases. He believed it was an extremely rare disease, though that was no reason for neglecting it. Any attempt to regiment people into institutions would create great difficulty, but it might be possible to establish a system of occupational centres like that in Denmark.

Lupus had a geographical distribution. It was common in Scandinavian countries and, he believed, unknown in Australia.

Dr. W. J. O'DONOVAN said that if lupus vulgaris was a problem of any size and had been neglected it would declare itself in the reports of the medical boards. In the whole of one Command, covering a quarter of the country, in which all difficult contagious conditions were referred to him, he had seen since the beginning of the war only 4 cases of lupus vulgaris, and those were slight. Up to the outbreak of war this was a diminishing problem, thanks to the greater care of public health, food inspection, and smoke abatement. When he began to assist Dr. Sequeira at the London Hospital there was a multitude of horrific cases, but these diminished as the years went on, while the number of early cases sent by school medical officers increased. In a paper in 1925 Sequeira said that the Minister of Health had conferred upon local authorities ample powers to set up clinics, and he believed these were sufficiently used in the areas in and around London. The key to the lupus problem was accurate initial diagnosis. It took him five years, during which he saw lupus daily in numbers of cases, before he was positive as to the state of the skin of the patients who came under treatment. Lupus was a manageable problem. He considered that the treatment at the centres could be applied, under a skilled and experienced sister, by nurses of the category familiar in the Army as V.A.D.s. At St. Louis he noticed that many of the nurses and hospital attendants had themselves suffered from lupus, and such people, if educated and courteous, should be the very best to persuade other patients to submit to the necessary treatment.

#### No Large Public Health Problem

Dr. A. M. H. GRAY said that lupus was not a large public health problem, and therefore had not been dealt with to any considerable extent from that point of view. At the same time, dermatologists would feel that it was only right for some active steps to be taken. The problem with adults was more difficult than with children, for some of them were unable to obtain work. Some arrangements for occupational therapy were desirable. Dr. Heaf had suggested that the treatment should be centred on general hospitals with teaching schools, but in London this would mean that the number of cases at each hospital would hardly be adequate from the teaching point of view. He would prefer to see cases of lupus transferred to one or two centres where treatment could be organized on a fairly large scale. Dr. J. A. H. BRINCKER pointed out that according to Lomholt the incidence of lupus in Denmark was about 1 in 1,000 of population. An investigation in London following upon Lomholt's visit ten years ago revealed very few cases. Dr. J. T. INGRAM said that in Leeds during the last fifteen years, from an area having a population of about 2,000,000, there had been 559 cases of lupus attending the out-patient department. Of this number 138 for one reason or other had no treatment. Of the 421 cases treated 324 were apparently cured, and in 175 of these the cure had persisted for from five to ten years. About 27 cases out of the total had been marked down as incurable, but any case of lupus returning to adverse psychological, nutritional, or environmental conditions was liable to relapse. Colonization was necessary for only a very small proportion of cases.

Dr. R. T. BRAIN said that many physiotherapists appeared to be frightened of ultra-violet light. He had often referred a patient with lupus to a local light centre, and had been told that he could have two or three treatments for a week, and then must wait for two or three months. He could not understand that attitude. It was important, of course, that the patient should not have latent phthisis, and it was the custom to refer patients to a clinician for examination of the chest. The kidneys also should not be forgotten, because a damaged kidney would be disturbed by the intensity of the radiation. But these conditions excluded, a patient could be given a very high concentration over a long period. Sir WELDON DALRYMPLE-CHAMPEL said that he would have liked to hear a little more about the competence of the general practitioner to make a provisional diagnosis of the disease. A certain amount of extra instruction in this disease should be given to medical students—enough at all events to enable them to suspect a case of early lupus and refer it to an expert for diagnosis.

## Correspondence

### Research in Ophthalmology

SIR,—I have read with interest the editorial entitled "Research in Ophthalmology" in your issue of Oct. 2 (p. 426), and while this undoubtedly merited a critical reply from some senior member of the profession, so far none has been forthcoming. One must assume that the reasons advanced for the undoubted paucity of basic ophthalmic research during the past decade in this country, which you so rightly deprecate, have the tacit approval of ophthalmologists. None has seen fit to join issue with you when you attribute a large measure of the fault to those junior ophthalmologists who "slip with such ease into the routine work of well-paid refraction clinics and thus side-step junior hospital appointments with their facilities for research."

This is, however, a most biased picture of the actual situation. In the first place it must be insisted that the causes which have operated to bring about the present unsatisfactory position reside at a much higher level in the ophthalmological hierarchy than the humble, overworked, and certainly underpaid ophthalmic clinical assistant and refractionist. The eye-hospital junior surgical appointments, with or without the facilities for research which you mention, are far too few to go round, so that a large number of practitioners genuinely interested in the academic side of the specialty are grounded at their particular level with little hope of advancement and with hardly any encouragement from above. For the most part they are excluded from the general work of the hospital and confined almost rigidly to the routine of the overcrowded out-patient departments. Their lot is one of discouragement and stultification, and until this pernicious system in eye hospitals receives its final quietus (and no movement to make an end of it is yet discernible from those responsible) it seems a pity to saddle this almost inarticulate stratum of the ophthalmic world with any major share of liability for the poor output of ophthalmic research.

However, the essential reason is the one you mention—"that the time is past when advances in knowledge can be attained by relatively simple methods by a single investigator," and particularly is this true in eye work. Surgical ophthalmology has already reached a very high stage of development, and medical ophthalmology can only advance in step with advances in general medicine as they occur. In fact, therefore, it is to medical ophthalmology that we must in the future devote the major part of our effort in ophthalmic research; but so long as ophthalmology is regarded as primarily a surgical specialty, and its academic associations continue to be inspired by this conception, the dearth of research is likely to continue.

For the past few years a section of the ophthalmic profession with these matters in mind have been endeavouring to establish a Faculty or College of Ophthalmology, and it is likely that in the near future their efforts will meet with success. Such a development is likely to result in a greater general level of interest and co-operation in ophthalmic research throughout the country than the isolated local establishment of professorial chairs attached to various universities and ophthalmic institutions, which, though laudable developments in themselves, are too restricted in nature to exert any widespread or rapid influence on ophthalmic education and research generally.

It is currently accepted throughout the ophthalmic profession that a regulated portal of entry into the profession which is nationally available and which is based upon high standards of both clinical apprenticeship and academic knowledge is long overdue. None of the present diplomas in ophthalmology satisfactorily equates the criteria mentioned, nor do the projected alterations in the F.R.C.S.Eng. (so far as one knows their details) seem likely to meet the requirements of the majority of ophthalmologists in practice.

It is the absence of such a central co-ordinating and stimulating institution in ophthalmology which is the most

important single factor in the very marked meagreness of ophthalmic research in this country.—I am, etc.,

London, W.1.

LIONEL M. GREEN,  
President, Association of British  
Ophthalmologists.

### Consultant and Specialist Services

SIR,—The letter of the Presidents of the three Colleges fills me with some uneasiness at the methods employed. They refer to an existing committee of the Colleges, which consists, among others, of eleven representatives from the non-teaching hospitals. As a consultant and member of the staff of a non-teaching hospital I should be very interested to know how these representatives are nominated and elected; as a Fellow of the Royal College of Surgeons and a member of the Royal College of Obstetricians and Gynaecologists I cannot recollect ever having been given an opportunity to nominate or elect such representatives.

The next point on which I should like more information is the steps taken by the Colleges "to ascertain what consultants and specialists are available at the present time." What are the steps that are being taken?

But perhaps the most disquieting statement is that "the result of this survey will not be published; it is for the personal guidance of the Minister." These appear to be unusual methods in a democratic country. How does a consultant know whether or not he has been put on this list or left out if it is all so secret? I sincerely hope that information may be published that will allay these misgivings.—I am, etc.,

Hove.

H. J. McCURRICH.

### Future of the Mental Health Services

SIR,—Last year, when it appeared a matter of urgency to present the Minister of Health with some considered ideas on this subject, the Royal Medico-Psychological Association, like certain other bodies, prepared its tentative recommendations. Now, with rather more breathing space, the association has set up a new planning committee, under the chairmanship of Brig. J. R. Rees, designed to represent every branch of the specialty. It is hoped that in each division of the association a local committee will meet to discuss and represent the views not only of the members of the R.M.P.A. but also of any, or all, psychiatrists in that area. The committee thus hopes to receive a number of considered plans, but, in addition, it will welcome all relevant suggestions put forward by any group or by individual physicians. The mental health of the nation is of paramount importance, and accordingly the future organization of the mental health services merits most careful thought.

All such communications can be sent to me as below, anonymity being preserved if desired.—I am, etc.,

11, Chandos Street,  
London, W.1.

W. GORDON MASEFIELD,  
Hon. Secretary, Medical Planning Committee,  
Royal Medico-Psychological Association.

### Returned Prisoners of War

SIR,—May a psychologist congratulate Major P. H. Newman (Jan. 1, p. 8) on his statement of the difficulties of the returned prisoner of war. It might be criticized as only naked-eye pathology, but no claim is made to anything deeper; psychiatrists welcome his first-hand experience and observations, and what might be a defect becomes an advantage when the object is to appeal to the ordinary doctor to recognize and understand the condition of these men. Yet my experience in the treatment of ex-Service men after the last war leads me to amplify or qualify some of his statements. Thus the choice of escaping and sabotage as one way of leading a constructive life is too simple a view, even when qualified by the remark that the choice depends upon temperament. I believe it is technically the duty of every prisoner of war to try to escape, but when I listened to a radio account of a man who succeeded after four attempts, though the victim of savage punishment and the witness of the shooting of a fellow venturer, I recognize his state as probably identical with that of other men whose repeated efforts to escape depended upon a pathological compulsion that persisted in other form—a tendency to fugues, for example—after return to civil life.

A more useful broadcast would be extracts from Major Newman's account of the effects of the deprivations and frustrations of the men behind the barbed wire.

Major Newman, perhaps because of the surgical outlook that persistently regards nerves as corporal structures, avoids that thought-stifling witch word *neurosis*, though he falls down once on *neuritic*. This makes more surprising his view that individual psychological treatment for any returned prisoner of war is "debatable" because "it may carry with it a public acknowledgment of mental abnormality, which must at all costs be avoided." This reminds us of, "He's not mental, doctor; it's his nerves," and is a poor reason for depriving the men of treatment that is now available for civilians in psychiatric clinics all over the country. I can assure Major Newman that the difficulty he pictures is quite familiar, and the solution is to remove the stigma from "mental." To-day I saw a letter from an ex-N.C.O. with 3½ years' service in the R.A.F., invalidated out for what he says was "anxiety psychoneurosis," who asks for treatment, and writes, "I find life very hard at the moment as I am not doing any regular work," then describes how he worked for six months, but "became worse and came back home where I have been ever since, doing odd jobs of work for my parents." Would Major Newman deny this man individual treatment (supposing it is desirable) lest it might involve public acknowledgment of mental abnormality?

I hope he will carry on the good work and place himself on the side of the psychiatrists, some of whom were struggling on behalf of their soldier patients a quarter of a century ago—often in the face of somewhat sadistic moral judgments used as diagnostic criteria—for the same understanding and tolerance that he now seeks for the troubles of the men whose cause he champions.—I am, etc.,

London. W. I.

MILLAIS CULPIN.

### The Prisoner-of-War Mentality

SIR.—As a slight relief from the depression which Dr. Richardson Billings's letter (Jan. 15, p. 90) might have caused in the minds of relatives of prisoners of war in the Far East, I should like to mention that in the beginning of this month I received from my elder son, Major G. F. Harrison, R.A.M.C., who is a prisoner of war in Camp A, Hong Kong, three postcards, dated respectively March 14, July 11, and Sept. 12, in one of which he said: "We have a very good library, and, when there is time, I am sampling the contents with pleasure." In another, after mentioning that he had read the whole of Shakespeare's works, he said he was glad to have the opportunity "to read stuff I never seemed to have time for before." Incidentally, in one card he said that he had seen in a local paper dated June 18, 1943, mention of an article of mine that had been published in the *Spectator* for the week previously. This quotation must have been derived from a German broadcast in which the article was mentioned during the week following June 11.—I am, etc.,

London. S.W.1.

L. W. HARRISON.

### Shock Therapy

SIR.—Dr. Winnicott's letter (Dec. 25, p. 829) should be taken not so much as a challenge to innovations in psychiatry but as a warning for us all to pause awhile and think seriously about the general direction in which medical progress is taking us to-day. We live in a world of "action and reaction." If a certain course of action is pursued long enough that it is not favourable to or in keeping with the internal economy of the "organization" or "organism," some catastrophe will be precipitated. In broad principle this is an inescapable truth and is universally applicable: if we think in terms of nations the catastrophe will be revolution or war; if in terms of industry, a strike; if in terms of the physical body, physical illness; if in terms of the mind, neurosis or psychosis.

We know very little more about the actual acquisition of disease than our forefathers did, or the real reason why a person falls ill. True we know a great deal about bacteria, viruses, etc., and enormous advances have been made in controlling the growth of these organisms; but what has modern medicine given us to enable a man to say: "I am proof against

disease" (unless of course he has been artificially immunized)? Is it really to the advantage of the human race that all our energies should be devoted to the "repair shop"? The more efficient we make the palliative side of medicine, the less urgent will be the need to look to ourselves, our habits of life, etc., as possible "courses of action" which are unfavourable to, or not in keeping with, the internal economy of the human organism.

Other contributors have ably pointed out that psycho-analysis does make an endeavour to understand why a person is ill as well as how. It is more than a mere therapy; it is a science based on the understanding of the interplay of conscious and unconscious forces. In judging the therapeutic properties of any "cure" we fall into error if we consider only the effect it has upon the symptoms of the illness and ignore the known pathology of the condition. In 1917 Freud outlined the psychopathology of depression (*Mourning and Melancholia*), and since then analysis has shown clearly that it can be regarded as a normal phase through which the child passes (though, of course, seldom observed as such). It would seem that the advocates of shock therapy will have to do one of two things: either think of the therapy in terms of what happens in the transference relationship with their patients by the introduction of fits, or else work out a new pathology in a physiological setting and demonstrate how the fit alters this structure.

It may not be without significance that nearly all the reports on shock therapy given by the administrators minimize the anxiety experienced by the patient and stress the harmlessness of the procedure. As a psychiatrist I have now had the opportunity of seeing quite a number of patients who have received this treatment at different centres. When telling me about the treatment they have nearly all stressed the terrifying nature of the procedure. This marked discrepancy of findings is, I think, most enlightening. It can be taken as a clue to the nature of the unconscious transference relationship initiated by the fit—one in which the aggressive component predominates, with its affect of hate and the reaction formation of terror; they are thus canalized and bound into this relationship and the patient is thereby freed. If this be true, then it would follow that the patient would repress the memory of his actual experiences and substitute some pleasing account for the benefit of the physician, and only later, to a sympathetic but otherwise disinterested person, can they tell the real facts. I would even go so far as to say that all reports given by these patients to any member of the staff of the hospital might be so biased as to be quite worthless, but would be very interesting as to what a patient can say and do under a certain set of circumstances which are not in keeping with his internal economy. This mechanism was clearly seen in a case of paranoia with delusions of persecution I was treating with insulin coma. He quite rapidly lost his delusions and substituted an ingratiating attitude. During the three months after conclusion of this treatment there was a gradual diminution of this "pleasing" attitude, and then a fairly sudden swing to the negative phase in which I was the predominating character in his delusional system of persecution.—I am, etc.,

Bishops Stortford.

D. N. HARDCASTLE.

SIR.—With reference to Dr. Winnicott's letter in your issue of Dec. 25, which has just reached me, the views of one who has used electric shock therapy in private practice in addition to psychotherapy may be of interest. As yet I am in the dark as to how electric shock works, but I do know to some extent what it does. In general, it has every appearance of acting primarily as a powerful and prolonged general tonic, so marked that it will rejuvenate to the extent of removing the ravages of several years (plus anxiety signs) from a paranoiac without in such a case altering the ideas one whit. I consider that it does this through a stimulation of the pituitary gland, and an indirect further stimulation of the whole endocrine orchestra, easily seen in the frequent upset of the ovarian rhythm. Acting on this view I have recently used subconvulsive doses, giving two or three at a time, with a total result in suitable cases as good as if convulsive doses are given.

I consider that heavy dosage may produce further effects—possibly fracture of the physical associational fibres in the frontal area. In some cases this may be of value, when a

patient is unwilling or cannot afford to undergo a prolonged course of psychotherapy, and in which treatment the association tracts of unhappy childhood may be "leucotomized." After due warning to the patient that such treatment is a surgical operation, I have attempted this twice, once with apparent success.

In general, I try to reserve electric shock for the middle-aged depressive, whose state is of physical origin, and only give it on occasion in the course of a session of psychotherapy as a physical tonic, making it quite clear to the patients that it will make them "feel" better in body and give them more factual energy, but that it will not alter the "feelings" of their minds in the least, which must be worked through and made fully conscious in the ordinary way. I quite agree that giving it to a child smacks of barely unconscious sadism.—I am, etc.,

Dublin.

L. F. DONNAN.

SIR.—As the result of analytical observations (using the method of analytical psychology) I am able to support Dr. Winnicott's statement; the process at work in shock therapy, from the patient's standpoint, is essentially akin to suicide, though, of course, actual suicide does not occur. The method of analytical psychology is different in many respects from that of psycho-analysis, so that it is a striking fact that two people using different methods arrive at almost identical conclusions.

I should like to point out that our view, derived as it is from the detailed study of individual cases, receives the strongest support from the reported efficiency of shock treatment for depressive cases, in which real suicidal impulses are common. If this conclusion be correct it would be extremely difficult for psychiatrists using shock treatment to see what is going on when the shock is applied, because they are participating in a method whose aim is to prevent the necessary information being revealed. Naturally these psychiatrists would deny the possibility of suicide coming into the picture at all. This has actually been demonstrated in your correspondence.

It is certainly bad psychiatry to use shock therapy as it is being used to-day, and the ethical question cannot be brushed aside in the cavalier fashion which some of your correspondents assume.—I am, etc.,

Nottingham.

MICHAEL FORDHAM.

### Significance of Dysphagia in the Psychopathic

SIR.—In the article describing a case of conversion hysteria v. Dr. Ranyard West (Nov. 27, p. 676) there are several points in the case which I think are worth further explanation. In spite of the extremely psychopathic history which the patient showed, may I ask if the diagnosis of myasthenia gravis was ever considered in this case? In the early part of the history it is stated that the patient could drink fluid in the morning, though not easily, but later in the day the fluid went the wrong way. This dysphagic symptom is extremely suggestive of myasthenia gravis, where muscular effort becomes increasingly difficult as the day progresses. We also know that in myasthenia gravis there are normal remissions of the disease which might account for the improvement of the patient with psychological treatment. The fact that the analysis took forty sessions seems to imply that the treatment took a long time to become effective.

Recently I have seen a case of a girl who was considered as a psychiatric problem for three years, whereas, in actual fact, she was a clear-cut case of myasthenia gravis. One psychiatrist had missed the myasthenic facies, and considered she showed the typical *belle indifférence* of the hysteric. The fatigue which she complained of was also put down as a neurotic symptom. It is true that in the early stages myasthenia gravis can be extremely difficult to diagnose, particularly differentiating it from a hysterical condition.

I do not say that Dr. West's case was one of myasthenia gravis, but certain points in the history are rather suggestive. I would also add that I consider dysphagia to be a very rare hysterical symptom.—I am, etc.,

M. CAMPBELL,  
Squadron Leader, R.A.F.

### The Mosley Incident

SIR.—Now that the conditioned release of Sir Oswald Mosley from detention under 18B has lost its sensational news value it may not be improper to consider those of its aspects which are of interest to the medical profession. They are two in number: one relates to herd psychology and the other to constitutional and ethical procedure.

**Herd Psychology.**—The "patient" in this case is a private citizen with a private citizen's rights, including that of entertaining and maintaining his own political faith. This country is at war with nations who contest that right and who do all in their power to suppress it, and it is largely to maintain what we believe to be an individual freedom of faith that we are fighting. But owing to the war it became necessary to prevent the patient from actively spreading his gospel without interfering with his freedom of faith and without any intention of inflicting punishment. A large proportion of the herd became confused in their reaction to the conditioned release of the patient, and showed by their behaviour and by their written and spoken word that his punishment by severe suffering or even by death was the object of their desire. And, as is not unusual, the herd instinct may be described in this instance as quite illogical and indefensible.

**Constitutional and Ethical Procedure.**—The patient, being ill, had a right to medical advice, and his medical advisers, strengthened by the opinion of eminent consultants, reported that his health and perhaps his life would be endangered by further detention. At this point a question arises which is one of constitutional and ethical importance. Has this patient also lost his right to professional secrecy in regard to the nature of his malady? And further, if he had not lost it, did he attempt to exercise it? The nature of the patient's malady and the treatment prescribed were publicly disclosed, whether with or without the doctors' consent we are unaware. At any rate the disclosure gave rise not only to uninformed and hysterical criticism in the Press but to ignorant and foolish questions in the House of Commons. In both instances a lamentable ignorance on the part of the public was brought to the surface. A doctor's responsibility is not only to treat his patient's local disease but to treat his patient as a whole.

We may hope that no further incident of this kind may happen, but we may justifiably ask for an authoritative statement in reply to the constitutional and ethical questions which I have raised. Without prejudging the issue I would suggest that the medical report given to the public would have satisfied all legitimate demands if it had contained only words to this effect: "In our opinion the health and perhaps the life of Sir Oswald Mosley will be endangered by his further detention."—I am, etc.,

Oxford.

E. FARQUHAR BUZZARD.

### Vulvovaginitis in Children

SIR.—In his article on the treatment of gonorrhoea in the female Brig. Osmond has necessarily given a restricted account of vulvovaginitis in children, but I regret that he has not stressed the importance of in-patient treatment under the best hygienic conditions. Many of these children come to us in a depressed state of general health, infested with vermin, and with impetigo and other skin diseases. A survey of admissions since 1939 shows that only 48% were found to be gonococcal before or after admission, so that the majority of vulvovaginitis infections under 10 years of age are due to other organisms—e.g., the staphylococcus, *B. coli*, streptococcus, etc.—and the primary lesion is usually found in a site other than the genital tract. Frequent bathing, good food, fresh air, and regular discipline do wonders for these children, and without such an improvement in general health no chemotherapy can give the maximum results.

In our experience gonococcal vulvovaginitis that is not sulphonamide-fast is best treated with sulphadiazine, as (in our hands) no toxic manifestations have been observed, such as may occur with the routine administration of sulphapyridine and (to a lesser degree) sulphathiazole. Resistant infections (and a relatively large proportion of such are sent for admission subsequent to failure as out-patients elsewhere) are notoriously difficult to treat. Encouraging results are being afforded by the local application of penicillin filtrate, but

restricted supplies do not yet allow of dogmatism. In the present state of our knowledge it would appear to be wisdom for all gonococcal vulvovaginitis infections to be considered as individuals and for no empirical treatment to be given as a routine measure. Furthermore, emphasis must be laid on the necessity for keeping these children under close observation for at least six months after the initial infection. Only thus will "relapses" be avoided and the danger of spread to other children in the home or the school be eliminated.—I am, etc.,

London, W.1.

G. M. SANDES.

### School Medical Service

SIR.—Dr. Ganlin's letter (Jan. 15, p. 90) would appear to be based upon a misunderstanding of the Education Bill. Were the position to be as he envisages it, then I fully agree that the results would be disastrous. The present routine cleanliness inspections are, however, carried out under the powers given by Section 122 of the Children's Act, 1908. This section it is not apparently proposed to repeal. It would appear to follow that the powers given by Section 52 of the Education Bill are supplementary to those already possessed and not in substitution thereof, which is a much more satisfactory position, though I doubt, personally, whether the proposed new powers will prove in practice to be of much use, since only cases of gross infestation are likely to come to the notice of the teachers.—I am, etc.,

A. C. TURNER,  
Senior Medical Officer,  
City of Leicester Education Committee.

### Nightwear for the Troops

SIR.—I was amazed recently at the information given me by the wife of an A.C.2 that no provision of nightwear is made with the uniform. Further, an application for coupons to make good the deficiency was refused on the grounds that it was unnecessary. If this is the official policy in such ranks of the Services I am concerned, not as was my informant that those who refuse to lower their standards must provide nightwear at their own expense and that of their family's coupons, but that those with low standards receive no encouragement to raise them; rather they have the official seal set on them. One of the revelations, brought to light by evacuation, of the low standards of personal hygiene prevalent in the population was the absence of nightwear. In *Our Towns*, which so admirably surveys the many deficiencies found, one of the suggested remedies lies in adequate education. For many years, of course, health visitors and teachers have worked along these lines, but have been handicapped in part by ignorance that certain habits existed; and they in common with others were shocked when the closer contacts of evacuation showed them up. If every child spent a period at a residential school he would learn certain principles of hygiene by putting them into practice which he would never learn from blackboard instruction; but even if this were possible it would not be until the next generation that the full effect could be felt, whereas there is, in the masses of young adults now under discipline in the Services, a good field for practical health education.

Perhaps in some directions the opportunity is being used and the question of nightwear may seem relatively unimportant, but is it not true that such a simple process as changing the clothes helps to keep down the parasite population and thereby mitigate the disease and discomfort caused by parasites? In modern warfare there will inevitably be large numbers of men stationed permanently well behind the front line, and it is surely not necessary for the same standard to be applied to them. What do the medical officers to the Services think, or are they not consulted in such matters? I believe these remarks do not apply to the women's Services, so why the sex differentiation?—I am, etc.,

Leicester.

JANET M. DONE.

### Prostigmin in Delayed Period

SIR.—Dr. E. Friedmann, in the *Journal* of Jan. 1, suggests that prostigmin should be tried "in all cases of delayed period except those of endocrine origin and those in which pregnancy has been established." He classes as "unsuitable patients" those with "obvious endocrine disturbances, a history of long-

standing amenorrhoea, or obvious menopausal symptoms," and relates that he has treated nine such patients "unsuccessfully."

What does he mean by "obvious endocrine disturbances" or "obvious menopausal symptoms"? The fact of the endocrine disturbance or menopausal symptoms being obvious or not depends only upon the powers of observation of the observer; the word "obvious" has nothing whatsoever to do with the condition of the patient and cannot describe it. What is obvious to one person may not be so to hundreds of others, and because a particular doctor does not notice a disturbance it does not mean that a disturbance is not present.

I would like to draw the attention of your readers to the fact that no good can result from Dr. Friedmann's recommendation that prostigmin be administered in "the treatment of delayed period," though they will possibly succeed in lulling their patients into a false sense of security if they act upon it.

He says that the drug should not be "tried where pregnancy has been established," yet in 30 out of his series pregnancy was the cause of the "delay"; pregnancy was "later discovered on clinical or biological investigations or the patients were known to be pregnant." Why does he recommend to others a procedure different from the one he himself has adopted? "Pregnancy," Dr. Friedmann says, "is not disturbed . . . prostigmin is safe . . . there is no tendency of the drug to interfere with the course of pregnancy." How is Dr. Friedmann to know that pregnancy has not been disturbed in some of his "successful cases"? It would seem beyond his power to establish a diagnosis of pregnancy in "a case of delayed period" without resorting to a "wait and see" policy or to help from laboratory tests.

He records that 24 of his cases were "poorly selected." Did he select them, and if so, why? He injects sterile water into 10 women: he observes, "No bleeding occurred." These cases must have been properly selected! For what reason does the injection of sterile water here prevent the menstrual flow? There is no reason why even a "delayed period" should not appear after such an injection, but in his cases the period obligingly waits for the "proper prostigmin course" which followed.

His experiments prove nothing and help nobody, and one wonders what ultimate good Dr. Friedmann hopes to have done by them. Should it not be the doctor's foremost endeavour first to decide whether the "delay" has occurred in the course of a harmless physiological process, or as a symptom of maladjustment leading to displacement and undue pressure on vital organs? Dr. Friedmann does not give any evidence that he even thought of assessing the influence of faulty functioning in his "diagnosis," which, therefore, was not a full and reliable diagnosis.

Is it not reasonable to consider and establish first the cause or causes, to ask first why a woman has a delayed period? Is it not misguided to produce the period at all costs, to "try prostigmin" and to proceed with "further clinical work to reveal the interesting effects of prostigmin in cases of dysmenorrhoea"? Dr. Friedmann will not find the means whereby to alter faulty functioning among the multitudinous variety of drugs on the market to-day, and though he may produce the period he does not put right the cause of the delay in such cases. And before proceeding with further useless experiments and recommending others to do likewise he would do well to become conversant with the work of F. Mathias Alexander, whose approach to all problems is first to establish beyond doubt the cause or causes, and who has provided a technique by means of which problems of faulty functioning can be solved.—I am, etc.,

London, W.1.

DOROTHY S. RADCLIFFE DREW.

### Heroin in Labour

SIR.—Dr. James Ross (Jan. 8, p. 59) expresses a view with regard to the safety of heroin in labour which is in conflict with pharmacological findings and recorded clinical experience in respect of this drug. That a drug stated to be five times more depressant to the respiratory centre than morphine (Dilling, *Materia Medica*, 16th ed.) should have this remarkable degree of safety in labour calls for some comment.

Favourable reference is made to heroin as an analgesic drug in labour in Williams's *Obstetrics* (7th ed.), where a dosage of 1/12 gr. is stated to have "no deleterious effect upon the child



providing the drug has not been given during the three hours preceding delivery." Clark in *Applied Pharmacology* (6th ed.) states that heroin "is in no way safer than morphine," and refers to heroin as being about 10 times as toxic as morphine. Heroin was introduced by Dreser in 1898. If Dr. Ross is correct in his estimate of its value in labour it is indeed remarkable that recognition of the value of heroin in this respect has been so long delayed.—I am, etc.,

Turriff, Aberdeenshire.

A. T. FORBES.

### Diet and Peptic Ulcer

SIR,—I am afraid that Dr. Maurice Webster has misunderstood Sir Arthur Hurst's meaning. One may disagree with Sir Arthur's speculative theories, as I do, but his factual observations cannot be assailed. I sympathize with Dr. Webster, but however hot his hyperchlorhydria may feel, a cold impersonal approach must remain the basis of all scientific investigation.

It is a practically daily observation, which is not sufficiently appreciated, that although hypochlorhydric patients are temporarily relieved by alkalis, their cure depends entirely on the administration of sufficient hydrochloric acid. "Heartburn" is a most deceptive symptom, and easily misleads the unaware practitioner, because his whole attention is focused on HCl as the cause of peptic ulcer. All authorities agree that HCl by itself cannot produce the ulcer. My own view is that hyperchlorhydria is the first manifestation of the pre-ulcerative stage. All foods give a quantitative physiological secretory response. It will surprise many of your readers that gastric stimulation of water gives a positive response (Rehfuß *et al.*). The important point, however, is to discover what happens when the stomach is empty, for it is at that moment that the sufferer becomes aware of his symptoms. Whenever the stomach contracts it produces acid, but why should the stomach contract so violently when it is empty even a long time before any signs of chronic ulcer become apparent? The most likely explanation is that it reacts to some form of irritation, probably local. My explanation is that this occurs when the normal mechanics of the intestinal tract are upset—i.e., when iso-peristalsis is interfered with—by one cause or another. All the trouble begins from that moment. The implications of this thesis, however, are too complex to be dealt with in the short space of a letter.—I am, etc.,

London, W.1.

J. JACQUES SPIRA.

### Riboflavin in Hereditary Syphilis

SIR,—Recent articles in the *Journal* have shown the importance of the vitamin riboflavin as a therapeutic agent in inflammations of the eye and skin found in acne rosacea and also in cases resembling pellagra. In the keratitis associated with acne rosacea blood vessels and infiltrates are found in the superficial part of the cornea and, in aggravated cases, ulceration. The beneficial effect of riboflavin in rosacea inflammations of the eye has been known for several years; but it is not so widely known that this vitamin has also a curative effect in interstitial keratitis due to hereditary syphilis. Interstitial keratitis is characterized by the ingrowth of adventitious vessels into the substantia propria of the cornea as well as infiltration of cells. The following two cases show that riboflavin may be a therapeutic agent by itself.

**Case 1.**—A youth aged 18 attended the out-patient department of the Chelmsford Hospital with a keratitis accompanied by circum-corneal injection. Slit-lamp examination showed the lesion to be situated in the substantia propria of the cornea. No mention is made in the notes of corneal vessels. Wassermann and Kahn tests proved negative. Treatment by atropine and ascorbic acid failed to cause any improvement; sulphonamide tablets did not help. Carious teeth were extracted without avail. On Oct. 2 riboflavin (1 mg. t.d.s.) was substituted for the ascorbic acid. Compared with the former treatment it acted like a charm. On Oct. 16 the circum-corneal injection had disappeared as well as the corneal opacity. Shortly afterwards he joined the Army, having passed his medical tests.

**Case 2.**—A girl aged 13, sister of the patient in Case 1, attended the clinic on Jan. 20, 1943, both eyes having been affected by interstitial keratitis of several weeks' duration. The case was typical. There was photophobia and lacrimation. Both eyes showed the typical salmon patch due to corneal vascularization. Corneal opacity and iridocyclitis were present. Teeth were typically Hutchinsonian. Wassermann and Kahn tests were positive. The

cause of the lesion in the brother's eye was now apparent. As he was several years older, the toxin had become more attenuated, the W.R. negative, and he showed a much milder corneal lesion. As riboflavin had caused such a marked effect in his case the same treatment was given to the sister. Notes record that on Feb. 20 the eyes were free from corneal injection. Later a complete course of novarsenobillon was given combined with riboflavin. Slit-lamp observation on Nov. 5, 1943, showed the cornea free from infiltrates and the corneal vessels represented by a few hair-like lines.

I ought to mention that in a case of acquired syphilis with deep vascularized keratitis and severe iridocyclitis in one eye treated by arsenical injections, riboflavin as an adjuvant did not appear to help. In the case of a young man with a vascularized keratitis of unknown origin, where the W.R. was negative and where syphilis could be excluded, riboflavin did not afford the expected improvement.

Will riboflavin prove a remedy in other manifestations of hereditary syphilis? In acne rosacea the ophthalmologist watches with interest the improvement which the administration of the vitamin effects in the skin of the face. In like manner the syphilologist may find a use for riboflavin in his department.—I am, etc.,

Chelmsford.

S. G. CORNER.

### Spontaneous Hypoglycaemia

SIR,—In your issue of Dec. 11 Dr. R. D. Lawrence expresses the view that spontaneous hypoglycaemia as an explanation for many minor indispositions has been overdone recently. Dr. Luntz, while supporting Dr. Lawrence, states that both hyper- and hypo-glycaemia are but "symptoms," but he rightly emphasizes that the nervous type of hypoglycaemia is a different phenomenon from that of hyperinsulinism, which term should be reserved for islet tumours of the pancreas. However, this statement, which suggests that the level of sugar in the blood is a "symptom," is one to which exception must be taken. Hypo- or hyper-glycaemia of itself can surely never be a symptom. The symptoms in neurotic patients to which Dr. Luntz refers are inevitably the reactions of the patients' nervous system to hypoglycaemia—if levels above 70 mg. per 100 c.cm. B.S. should be called by this name.

There is now evidence that individuals with cerebral dysrhythmia (about 10% general population and 26% of psychoneurotics) are particularly susceptible to lowering of the blood sugar, even to normal fasting levels. We have reported such a case, in which the electro-encephalogram (E.E.G.) was unstable below 100 mg. per 100 c.cm. yet stable above this level (*Lancet*, April 24, 1943). In these cases the symptomatology should not be regarded as purely hypoglycaemic, but as due to the increase of cerebral dysrhythmia which occurs. Our findings show that the normal E.E.G. does not exhibit instability at levels of blood sugar above 40 mg. per 100 c.cm., while dysrhythmics become unstable at higher levels. It has long been known that the onset of hypoglycaemic symptoms, as well as the onset of coma (Fraser, R., MacLay, W. S., Mann, S. A., *Quart. J. Med.*, 1938, 25, 115), are not related to any one level of blood sugar, and vary from individual to individual. No doubt constitutional abnormalities of electrocortical stability are among the factors determining these differences.—We are, etc.,

DENIS HILL.

WILLIAM SARGANT.

MOLLIE HEPPENSTALL.

### Chemistry of Vitamin Therapy

SIR,—The articles on vitamins in the *Journal* of Jan. 15 show, if I may say so with the deepest respect, a lack of appreciation of the chemistry and functions of these bodies. The addition of 25 mg. ascorbic acid to the diet of any person who already has enough can make no difference. If Prof. Davidson had first estimated the urinary excretion of vitamin C, and then confined his treatment to those whose excretions were below the minimum physiological standards of Harris, the recorded results would have been different. Similarly with the case of the compound vitamin capsule: what good can a jumble of vitamins do if the recipients are already taking a sufficient diet?

The weakness of both these experimental groups is that the individuals were all apparently well. My colleague and I offered for your acceptance some months ago a series of 600 analyses where the vitamin C excretion had been estimated

by Harris's three-hour technique, and which showed a significant difference between the apparently well and the sick; whereas the well averaged comfortably above Harris's line, the sick were consistently below it. So any addition of vitamin to the well cannot have any demonstrable effect. Vitamins are not fuel; they are catalysts whose presence is necessary for metabolism, but an excess of catalyst will not increase the magnitude of the chemical reaction.—I am, etc.

Caernarfon.

GRIFFITH EVANS.

### The Rocking Stretcher

SIR.—Judging by the descriptions of rocking stretchers published in recent numbers of the *Journal*, there must be a competition to design some device or pivot to allow ordinary stretchers to be rocked. Mechanically these inventions are ingenious, and no doubt give great satisfaction to their inventors. Unfortunately, however, a rocking stretcher is intended for the resuscitation of the drowned or otherwise unconscious patient who is not breathing. I wonder how many of the inventors have considered the difficulty of safely securing an unconscious patient, who is limp and lifeless, to a rocking stretcher. To practise with a conscious subject is easy, but to fasten a toneless body on to a rocking stretcher by tying the ankles and wrists to the stretcher pole, as some inventors seem to consider satisfactory, is to court disaster. Serious damage to the limbs would be the least result, and I can imagine fractures of all types, even of the cervical spine.

I have recently had the experience of endeavouring to resuscitate an electrocuted girl of medium height and weight by means of a rocking stretcher. From this I can say that unless a proper brace, fitting between the patient's legs, dividing and fastening over the shoulders (similar to that provided on stretchers manufactured by Messrs. Siebe Gorman), is employed to keep the patient in position, an unconscious patient who is limp and flaccid would very quickly slide off the stretcher.

The inventors of rocking stretchers would be surprised to find how difficult it is to keep an unconscious patient safely fastened on to a rocking stretcher. Perhaps before any further methods of pivoting stretchers are invented they would do well to pause and consider this point.—I am, etc.,

Southwell, Notts.

T. A. LLOYD DAVIES.

### Cleansing Gas-contaminated Persons

SIR.—In the *Journal* of July 17, 1943 (p. 81), you published an article by Dr. Pollok Donald on a new method of gas training, together with a diagram illustrating a miniature gas-cleansing station. I entirely concur with Dr. Donald as to the apathy with which this subject is treated. If this apathy did not exist your correspondence columns would be full pointing out Dr. Donald's glaring mistake. It may be that he intended this to be so in order to gauge this apathy, as he says that his object is "not to instruct but to show how instruction may be given in a way acceptable to all concerned." His object is good but his diagram is dangerous.

If Dr. Donald is a gas instructor he should have read the official handbooks, in which case he would hardly have put his eye douche in the third compartment from the entrance to the station. This is most important, and the immediate treatment of blister gas in the eyes should be stressed to everyone in the country. The basis of all training is common sense, and this applies especially to anti-gas training. If anything falls in the eye obviously the first thing to do is to remove it mechanically. With a liquid, equally obviously the way to do this is to wash it out with large amounts of water. Applying common sense, the water should be warm to prevent spasm. As blister gas begins its foul work immediately it is only common sense to remove it at once. The penalties for delay are painfully obvious.

What happens in the gas-cleansing station in the diagram? The wretched patient arrives in a panic suspecting blister gas in the eye. Is his eye washed out at once? No. He has to go through endless formalities with labels, string bags, etc., and eventually is persuaded to have his outer clothing removed. He then goes through an air-lock, and entering another compartment is reduced to his birthday suit. Still clutching his

valuables, which have been horribly in the way of undressing, he enters yet another compartment, where he joins the queue for the eye douche (singular). The proper place for eye douches (plural) is at the reception ("dirty") end of the gas-cleansing station, and liquid gas in the eyes must be attended to at once. It is advisable to have a store of anti-gas ointment in the "dirty" end. This is not marked on the diagram, but is doubtless not overlooked in practice. And this reminds me, every family should have a stock of anti-gas ointment (preferably No. 5) in good condition.—I am, etc.,

F. PITT PALMER.

Cmndr., R.N. (ret.)

### Treatment of Coryza

SIR.—Adverting to Mr. Carew-Shaw's letter (Dec. 25, 1943, p. 830) regarding the treatment of coryza with ephedrine and argyrol in normal saline, I would like to point out that it appears to be quite beyond the ordinary pharmacist's facilities to produce a stable solution of these components. Undoubtedly many doctors will have been interested in Mr. Carew-Shaw's advice, and I feel that they should know that a stable solution is apparently only available in the form of a proprietary product. Unless this is made clear others will prescribe argyrol, ephedrine, and normal saline, as I did, only to find that a precipitate appears almost immediately, and that the resulting unstable solution causes congestion and crusting of the nose, as Mr. Carew-Shaw has observed.—I am, etc.,

London, W.I.

A. PINEY.

### Fact and Fancy in Poliomyelitis

SIR.—My attention has been drawn to the leading article in the *Journal* for July 31, 1943. This is in part a review of the book published by the Bruce Publishing Company, St. Paul, Minnesota, and presented by Dr. J. F. Pohl and myself, with the foreword written by Dr. Frank Ober, professor of orthopaedic surgery, Harvard University, and commentary by Dr. Miland Knapp, professor of physical therapy, University of Minnesota.

At the onset you state: "It is permissible to regret that Sister Kenny was not content to remain an outstanding practitioner of her particular art, and that she succumbed to the temptation to rationalize her methods by providing a scientific basis for them." I may here emphatically emphasize the fact that there was no one on earth more content to pursue the even tenor of my way than I, right from the onset in my early Australian days, and that all my activities have been by special request. The public presentation of my work in Australia was made by special request. My visit to the United States was arranged by my own Government and a group of medical men in Australia, who wrote to the senior orthopaedic surgeon of the world-famous Mayo Clinic. My association with the University of Minnesota was made by special request. My association with the University of New York was by special request. My position as honorary director of the Elizabeth Kenny Institute was accepted by special request.

You say that I have formulated an entirely new concept of the disease. This is also the opinion of all medical observers. It was first published by Dr. Wallace Cole, professor of orthopaedic surgery, and Dr. Miland Knapp, professor of physical therapy, University of Minnesota, in the *Journal of the American Medical Association*, June 7, 1941. In this paper they state that the concept of the disease is entirely the opposite of that previously recognized, and this new concept had been proven in 100% of cases. This is also the opinion of Dr. Frank Krusen, professor of physical therapy, Mayo Clinic, published in the paper presented in the *Staff Bulletin*, Aug., 1942. In this paper Dr. Krusen admits that he thought I was unbalanced when I arrived in the United States and presented my ideas, but added that he admitted "she has presented to us an entirely new concept of the disease anterior poliomyelitis and a satisfactory treatment for this concept." Before my arrival in the United States the percentage of recoveries according to statistics published in the *Journal of Bone and Joint Surgery*, Oct., 1941, was 13. Since my arrival in the United States the recoveries are 88%. I have also been requested to assist in preparing a book on the muscle physiology and function. This is now in operation.

I am quite sure that if your Association could see its way clear to send a suitable physician to Minneapolis we would be in a position to present sufficient evidence to prove that the old concept of the symptoms presenting themselves in this disease was incorrect. I am also happy to say that I could prove to him that there is a certain condition existing in this disease which indicates that portion of the body in which the disease is likely to attack, and by the prompt administration of treatment the progress of the disease can be arrested in a great many instances. It has also been acknowledged that the physical therapy procedures introduced by me have proved most advantageous in other types of neuromuscular injuries and war wounds.

I quite understand your criticism. As a matter of fact it is extremely mild in comparison with the criticism I first met with in this country by those who now strongly support my work. Therefore I would very much appreciate the publication of this explanation.—I am, etc.,

Minneapolis.

E. KENNY.

### Photomicrography with Ordinary Cameras

SIR,—I was much interested in the article on photomicrography with ordinary cameras by Dr. W. N. Leak (Dec. 18, p. 787), and would like to point out that colour photomicrographs and the method of taking them with ordinary cameras were demonstrated by me at the Dermatological Section meeting of the Royal Society of Medicine held in London on March 19, 1942, when I showed colour photographs and photomicrographs of sections of two rare skin diseases.

The method of taking colour photomicrographs without the use of any special apparatus is as follows: "The section is placed and focused under the microscope in the ordinary way, then the microscope with the slide in position is tilted into the horizontal position and the reflector adjusted to give good illumination. The miniature camera, a Zeiss Ikon, is brought up to the ocular of the microscope in the same horizontal plane till it just touches firmly. All extraneous light is excluded by means of some suitable covering—e.g., a piece of dark cloth wrapped round the junction. Film used was Kodachrome A (for artificial light). One photoflood light was used and reflected as described above. The camera lens was set for infinity, the aperture used was  $f/3.5$ , and the exposure was one-fifth of a second. One-tenth of a second was also tried, under the same conditions, but was not sufficient. I hope to make further trials of this simple method of taking coloured photomicrographs as it does not require any special apparatus" (vide *Proc. roy. Soc. Med.*, 1942, 35, No. 4). I might add that the colour photomicrographs referred to above were shown in the scientific and technical section of the 1943 Annual Exhibition of the Royal Photographic Society of Great Britain in London.

Colour photomicrographs are very much more interesting to look at, and lend themselves as an ideal means of projection lantern for demonstration at meetings, etc.—I am, etc.,

Leicester.

F. A. E. SILLCOCK.

### Emulsions

SIR,—May I suggest that there is another aspect of emulsions than that mentioned by you on Dec. 18 at page 803, one which is really of great importance to practical medicine, though it is seldom considered. The work is very old. So far as I remember, Pickering, in the last century, showed that a solution of phenol in water might have little disinfecting power; but if an emulsion of some inert oil, or very fine inert solid particles, were added the bactericidal power was increased. This was followed by many others, and, so far as disinfectants go, gave rise to those with "high coefficient."

There is a boundary between a drop of water in oil or of oil in water. This boundary is due to electric charges—molecular attraction, if that term is preferred—which cause the drops to be round, and which also include surface tension phenomena. The less the diameter of the drop the greater the force per unit area; so that when the diameter is extremely small the force is comparatively very great. The explanation of Pickering's work would be that the molecules of phenol are attracted to the interface, so that the concentration per minute area is very great; whereas the concentration per c.c.m., say, is comparatively small. The bacteria also have charges

on their boundaries, and are also attracted to that interface (oil-water), so that they are exposed to the comparatively strong concentration of phenol there.

This subject is a very large one and concerns many things in medicine, such as the function of the blood corpuscles, tissue cells, and so on. The odd thing is that, although it is mentioned in textbooks on physiology, it seems to be completely ignored in practical medicine; yet it is of much importance in that sphere.

Dealing with dermatology, I should say that the subdivision of the remedial agent increases its "potency," because the charges at the interfaces will react with charges on the prickly cells, or on the prickles themselves; so that in the first case there will be stronger reaction between the agent and the cells; in the second, the agent will be able to pass more readily between the prickles and affect the cells underneath. The result might be a variation in the outermost cells or in those below them. I know of no proof that the prickly cells have a charge, but they are chitinous, and there is definite proof that emulsions wet chitin more readily than water—the nail, for example.

The "value" of an emulsifier will depend on its ability to reduce the oil (to use popular terms and not phase-theory terms) to extremely minute drops; and that is why some of the modern emulsifiers are more useful. So the "value" can be estimated by such determinations as the surface tension, number of globules, opacity, and so on. The detergent effect of soaps is due to this property—it is really a fine emulsion. A solvent will wash away a greasy mark on the skin by dissolving the grease, and often substances from the cells of the skin. A soap acts by emulsifying the grease so that it is washed away with the dirt by plain water. If the soap is alkaline it will also affect the cells; if it is superfatted it will tend to supply some fat to the cells (it also annuls the alkalinity of the soap due to dilution).

All this business of charges, etc., is very intricate and requires a good knowledge of mathematics. But it is not necessary for the practitioner to know that: only that he shall understand the results and be able to apply them in practice. So I suggest that there is really great scope for some medical man who is lucky enough to know sufficient maths. to write up an account of it—as to how, when, and where it may affect practice. For instance, it must be concerned in the problem of feeding and digestion of milks; for the globules of fat vary in diameter and the protein adsorbed to the globules varies. One peculiarity concerns the dermatologist—namely, that there is evidently some practical difference between solutions, emulsions, and ointments. One can compare the effect of a "blob" of ointment containing, say, 30% of calomel with a solution of mercury biniodide 1 in 1,000, or more dilute as preventive against spirochaetes.—I am, etc.,

Kingston-on-Thames.

W. F. COOPER.

### Malaria among Troops in W. Africa

SIR,—Your leading article (Jan. 15, p. 84) starts with a most misleading sentence. Your writer can have little personal knowledge of the place or he would remember month after month of perpetual Turkish baths, with no possibility of a change to a better climate till his next leave was due. He would remember the thirst produced by this heat and the boredom after sundown, and would probably think that he had consumed more alcohol than was good for any man. Could he forget yellow fever? Malaria would have bothered him little more than influenza in an English winter. Malaria is a mere fraction of West African unhealthiness.—I am, etc.,

O. G. WILDE.

\* By "unhealthiness" in inverted commas was meant a reputation for unhealthiness. It was not intended to imply that there were not other causes of ill-health in the climate of the West Coast of Africa and other tropical countries. The statement was an expression of the writer's own experience of life in many tropical climates, and is, he believes, generally speaking, true. Probably it is the heavy mortality from black-water fever—the result of malaria—which has usually been responsible for the gaining of such reputations. Yellow fever was in the past, again as a result of mortality, perhaps in the New World an even greater originator of evil reputations, but at the present time things have greatly changed.—ED., *B.M.J.*

## Obituary

### MAITLAND RADFORD, M.D. D.P.H.

Dr. Maitland Radford, whose death at the age of 59 occurred on Jan. 19, was one of those excellent medical officers of health who are able to achieve the most satisfactory administrative results with the minimum of officiousness and dissension. This ability was due partly to his wide knowledge of public health and his very alert and progressive mind, partly to his tact, arising from a natural sensitiveness to the feelings and opinions of others; partly to his charm, which was assisted not a little by his keen but kindly sense of humour and ready wit; and partly to the conscientious and energetic way with which he pursued his objects without the slightest regard to personal ambition. In spite of his urbane and generous manner, and though the overriding of other people's opinions was so far from being a pleasure to him that it was often an obvious embarrassment, nothing would induce him to do or say anything which conflicted with what he thought was right. In respect of his principles he was adamant and fearless.

Maitland Radford was the son of Ernest Radford, a barrister who lived at Hampstead, and who was also a progressive thinker and a friend of Shaw, Wells, William Morris, and Bradlaugh at a time when many of their ideas, which are now commonly accepted, were regarded with suspicion and even with hostility. There is little doubt that this background of controversy in the cause of rational thought and action had a profound influence on Radford's outlook and character. He was educated at Abbotsholme School, Derbyshire, and completed his medical studies at University College Hospital, where he qualified in 1912. In 1914 he took his M.B., B.S. (London), and during the war joined the R.A.M.C. as a temporary medical officer and was posted to No. 3 General Hospital in France. Later he returned to complete his study of public health at the North-Eastern Fever Hospital and Queen Mary's Hospital, Carshalton, and during this period he married Muriel Ann Lloyd, also a doctor, and the daughter of Dr. Henry Lloyd of St. Asaph, Wales. In 1920 he took the M.D. in State Medicine and D.P.H. (London), and in March, 1921, was appointed assistant M.O.H. to the borough of Shoreditch, where, after promotion to deputy, he became medical officer of health in 1927. He is still remembered in that borough for his efficiency, his easy and courteous manner, and especially for the great interest he showed and the considerable improvements he made in the maternity and child welfare scheme.

But though Dr. Radford devoted much energy to his immediate work he was not a man to allow the local trees to obscure his vision of the public health wood—or, as he might have said, the public health jungle—as a whole. He took a deep interest in general problems of public health, particularly in housing and health propaganda. He was a founder-member of the Central Council for Health Education and had much to do with the inception of that important body. For many years he was its honorary treasurer, and at the time of his death held the position of vice-chairman. He was also an active member of the Society of Medical Officers of Health, which he joined in 1920 and in which he was president of the M. & C. W. Group in 1931-2 and president of the Metropolitan Branch in 1940-1. In 1934 he became M.O.H. of the borough of St. Pancras, where his many good qualities were speedily recognized. He was chairman of the St. Pancras Division of the B.M.A. in 1936 and again in 1943. In 1938 he was a vice-president of the Section of Public Health and Hygiene.

The work of an M.O.H. is not often of a very dramatic kind, nor do the general public for whom he works often appreciate or even realize what is being done for them by a capable man in his position. It is, however, no exaggeration to say that there is no member of his staff or of the borough council who will not regret the loss of his leadership and that he will survive in the minds of many, not only as a memory, but as a permanent influence on their thoughts and actions.

C. H. writes: Radford was, in the best sense of the word, an intellectual. Essentially humble, his scintillating mind leapt from idea to idea, flashing a light just long enough to make clear his point before the beam passed with amazing swiftness to yet another idea. It is surprising that he found satisfaction in an administrative life. One could picture him as a university don, as a teacher, for he was above all a thinker. In the Central Council for Health Education he was a fountain of ideas, prodding the conventional, flicking the timorous with a wit which was as kind as it was charm-

ing. His interest was in ideas and principles, and he could be passionate in their defence. A good treasurer, though he knew and cared nothing for accounts; an efficient vice-chairman, though procedure left him cold, he would have been chairman, and a great chairman, in a few months' time. He leaves a gap which cannot be filled.

### F. WILFRED WILLWAY, M.D., M.S., F.R.C.S.

We regret to announce the death on Jan. 6 at the early age of 36 of Mr. Francis Wilfred Willway, temporary assistant surgeon to the Bristol Royal Hospital and a former Hunterian Professor of the Royal College of Surgeons. He was the son of the late Dr. Frederick Willway of Streatham, and studied medicine at King's College Hospital, whence he qualified in 1930 after graduating B.Sc. (London) with honours in 1928. In successive years he took the M.B., B.S., the F.R.C.S., the M.S., and the M.D., and after working as surgical registrar and casualty officer at King's he became in turn senior house-surgeon at the Royal East Sussex Hospital, resident surgical officer at the Royal Manchester Children's Hospital, and assistant surgeon to the West End Hospital for Nervous Diseases.

#### Prof. GEOFFREY JEFFERSON writes:

British neurosurgeons deplore the death of Wilfred Willway. It is unlikely that any of us will again see such a combination of debonaire heroism and sound practical utility as his life showed, not paralleled even by Hans Zinsser, who had a shorter battle to fight and was an older man. Few people realize that death is close upon them, and none that I have known have treated the knowledge with Willway's good-natured disdain. Its gradual inevitability over a period of years failed to impair either his cheerfulness or his rooted determination to utilize to the full his many gifts in the service of his fellow men. He often spoke of his impending death and his determination that the knowledge should not deflect him from his duty. This was particularly evident at the height of the air attacks on Bristol, where he overdrove his ailing body. What was extraordinary about Willway was that he expressed no bitterness at the shortness of his days, no complaints that he would never see the fruition of his plans and dreams. None the less he accomplished a great deal. Some of his work cut into new ground (leucotomy), and he deserves great credit for his enterprise there, but he did also a great deal of solid work on more conventional lines. He had a brilliant, a mobile, intelligence and a great disregard for the sanctity of the opinion of his elders, from which all edge was removed by the knowledge that all that he had to say he said at once. And how entertaining he could be! We neurosurgeons cannot afford these losses from our ranks that the last three months have brought. Willway and Eden were a notable pair, and however time chances to fill the gaps those brave personalities are for ever lost.

#### A surgical colleague writes:

Wilfred Willway was one of the most brilliant students of King's College Hospital. He had that type of brain which makes its possessor able to play four games of chess and conduct a conversation at the same time. He never failed in any examination, took the F.R.C.S. (England) and M.S. (London) at an early age, and then the M.D. "just for fun," as he explained. He was a great teacher, whose students admired and loved him as did all his friends. As a man he was full of kindness and humility and yet charged with enthusiasm for his work and the welfare of his patients, students, and friends. Coming to Bristol from London, Willway entered fully into the teaching and professional work of the Bristol Hospitals and Medical School. He was a pillar of strength to the hospitals' staff, who, because of his sound organizing powers, gave him charge of the war emergency arrangements at the Royal Infirmary. Willway was Bristol's first neurosurgeon, and he was rapidly achieving a wide reputation for his work at the infirmary and the Burden Neurological Institute. He was particularly interested in the surgical treatment of mental disease and had performed more leucotomies than any other surgeon in this country. His papers on this subject in collaboration with neuropsychiatrists are highly important. For years he made a heroic struggle against the ravages of a remorseless chronic malady which from time to time laid him low, but each time he came up smiling again and would laughingly chat about the prognosis. His courage was admirable, and in the course of a long day's operating it is reported that on one occasion he fainted twice. His tall spare frame, high forehead, and rather prematurely bald head, with merry eyes behind his large glasses, were the introduction to a personality which was widely loved and will be sadly missed. He was on a plane above most people, and Bristol is a poorer place for his departure.

## G. H. PEARCE, M.D., M.R.C.P., D.P.H.

Dr. George Herbert Pearce, who died on Jan. 6, had been a member of the B.M.A. for 45 years. He was vice-president of the Section of Public Medicine and Industrial Diseases at the Bradford Annual Meeting in 1924, was chairman of the Dewsbury Division in 1931-2 and represented it at nine Annual Meetings, and became a member of the Insurance Acts Committee in 1936. He took the Scottish triple qualification in 1897, the D.P.H. of Cambridge in 1905, the M.D. of Durham in 1914, and the M.R.C.P. in 1935. His successor, Dr. W. J. Frajin, sends the following appreciation:

The death of Dr. G. H. Pearce removes one of the most prominent personalities in public health during this century. He had been M.O.H. for Batley for almost 30 years before his retirement 5 years ago. His great gifts of personality and ability soon began to be felt in his profession and his influence extended far beyond the boundaries of Batley. He worked hard to improve the status of the medical officers of health in the country, and those of us who belong to the younger school of M.O.s.H. owe a great debt to his untiring efforts on our behalf. He was an outstanding figure in the Society of Medical Officers of Health, serving as its president in 1932. He was well known at the Ministry of Health and was a friend of nearly all its leading medical officers. At Batley he produced a public health department which was probably second to none in the country. He was a gifted administrator, and as he was also a barrister-at-law his legal knowledge proved a great asset. He approached his problems fearlessly, the health and welfare of the people of Batley being his first concern, and with a stern sense of duty he attacked all obstacles. From his staff he demanded first-class efficiency. He was deeply touched when the Batley councillors combined to make him a presentation on his retirement, for he had the erroneous idea that he was not a popular man. He always contended that if an M.O.H. did his duty he could not expect to be popular with the community. Those of us who mix among the people of Batley know how much Dr. Pearce was respected for this quality of devotion to duty. During his retirement he did part-time service for the Ministry of Pensions at Leeds, a work which gave him great joy and satisfaction. He attended regularly the meetings of the Yorkshire Branch of the Society of Medical Officers of Health and was a very valued member, owing to his rich experience in procedure. He was ever ready to help the younger members of the profession with his wide knowledge and sane counsel. His fine Victorian courtesy of manner made him a charming companion socially, and this was particularly evident in his home.

## PROF. ALFRED VOGT, M.D.

Prof. Alfred Vogt, the famous ophthalmic surgeon and director of the University Eye Clinic, died at Zurich on Dec. 10, after a long illness, at the age of 64. He had resigned his chair at the university earlier in the year on account of ill-health.

Alfred Vogt was born in Switzerland on Oct. 31, 1879, and after studying at Aarau Gymnasium he went to the Universities of Basel and Zurich, graduating M.D. in 1902. There followed a series of house appointments, at the end of which, in 1909, he became chief resident physician at Aarau Hospital. There he was to spend the next nine years till his appointment as professor extraordinary at Basel, where in 1920 he was elected to the chair of ophthalmic surgery at the university. He was immediately put in charge of the research department, where he devoted himself with characteristic energy to the problems of senile cataract. He edited at this time Haefliger-Semich's popular manual, *The Pathology of the Lenticular System*. In 1919 he perfected the slit-lamp microscope, which is a binocular mechanism based on an optical system, for the focal illumination of the eye, as well as being responsible for the introduction of novel operative procedures into ophthalmic surgery. His celebrated *Text-book and Atlas of the Slit-Lamp Microscopy of the Living Eye* was published by Springer from 1921 to 1931. To facilitate the detailed examination of the retina he introduced infrared rays into ophthalmology, and, in order to study the true nature of snowflake and glassblowers' cataracts, he carried out experimental studies on the effects of various rays on the eyes. His subsequent researches, prosecuted with his usual thoroughness and enthusiasm, dealt with the healing of detached retinæ, with his discovery of glaucoma of the lens capsule, and with various forms of cataracts. In his investigations on the optical constants of the eye and on the crystalline lens he approached Helmholtz in versatility. In 1923 he was invited to assume the chair of ophthalmology at Zurich and the direction of the University Eye Clinic. It was from Zurich then that he achieved the widest international celebrity, though his basic work was done during his Basel years. He brought to the problems of ophthalmic surgery extensive knowledge of biology, internal medicine, and physics. As often happens to historic and popular figures, public attention has been focused on his skilful

operations, his brilliant technique, and the long pilgrimage of distinguished men who flocked to his clinic; but his fundamental contribution to medical science has been overlooked. However, in December, 1942, the Swedish Medical Society of Stockholm awarded him its most-coveted Gullstrand Medal, presented every ten years to the most distinguished ophthalmologists. We mourn with our Swiss colleagues the untimely death of one whose name ranks among the greatest of surgeons and whose work will long remain the embodiment of all that is best and noble in the traditional culture of Europe.

R. E. G. A.

Dr. RICHARD BEVAN LLEWELLYN, who gave long and faithful service as assistant medical officer under the Glamorgan County Council, died at his home at Llanishen, near Cardiff, on Dec. 1, aged 56. Fifth son of the late Alderman William Llewellyn, a former chairman of the Glamorgan County Council, he studied medicine at the University of Edinburgh and graduated M.B., Ch.B. in 1913, and later in the same year was appointed to the post he held until his death. During the last war Dr. Llewellyn served as a temporary captain in the R.A.M.C. in the Near East and Far East, and he joined the B.M.A. in 1917. He is survived by his wife.

Worcester and district has lost its leading ophthalmologist by the death after a short illness of Mr. BERNARD HAMILTON ST. CLAIR ROBERTS. He died at his residence near Worcester on Dec. 19. He had suffered from an infantile paralysis since childhood. St. Clair Roberts was the son of the late J. W. Roberts, L.D.S., of Dudley. He studied medicine at Mason's College, University of Birmingham, and was one of the senior prosectors in anatomy. He qualified M.R.C.S., L.R.C.P. in 1900 and was house-surgeon at Wolverhampton Eye Infirmary, senior house-surgeon at the West Bromwich District Hospital, and for three years house-surgeon at the Birmingham and Midland Eye Hospital. He was early appointed ophthalmic surgeon to the Guest Hospital, Dudley, and held that office until 1940, when he was appointed consulting ophthalmic surgeon. He came to Worcester in 1908 and was the first consultant to settle in the district. In 1911 he was appointed surgeon to the Worcester Eye Hospital, and he took a very active part in the work of that hospital right up to the time of his illness, only four days before his death. He was very largely responsible for keeping the hospital up to date, and was instrumental in acquiring new premises, when the work done made that an urgent necessity. He was beloved by all his patients, both rich and poor, and he was a true friend to them all. His opinion was widely sought by the medical practitioners in the district. He was punctilious in the performance of his duties at the hospitals which he served. He was ophthalmic surgeon to many of the education committees in the County of Worcester, and he had established an orthoptic clinic at the Worcester Eye Hospital. St. Clair Roberts had a most generous disposition and had no enemies. He had been a member of the B.M.A. for about 40 years, and in 1931-3 held office as president of the Worcester and Hereford Branch. He was a very active member of the Oxford Ophthalmological Congress and never missed a meeting; he was also a member of the Ophthalmological Society of the United Kingdom and attended meetings of other scientific societies. A memorial service held at the Worcester Cathedral on Dec. 23 was attended by many of his medical colleagues, friends, and patients. The address was given by the Dean of Worcester, who is president of the Worcester Eye Hospital. Mr. St. Clair Roberts leaves a widow and one son, who is studying medicine at Magdalen College, Oxford.—H. N. C.

Dr. FLORENCE SCOTT KIRK died suddenly on Dec. 22, while on her way to the Jessop Hospital for Women, Sheffield, to carry on her duties as pathologist. The daughter of Dr. Robert Kirk of Glasgow, Miss Kirk was born on March 8, 1889. She was educated at the Glasgow High School for Girls and at Glasgow University, where she graduated M.B., Ch.B. in 1915. She held resident appointments at the Royal Maternity Hospital, Glasgow, and the Royal Infirmary, Oldham, and in 1917 became a civilian medical practitioner attached to the R.A.M.C. In 1918 she was transferred to the 1st Eastern General Hospital, Cambridge, as pathologist, and when that hospital was closed in 1919 she was transferred to the Central Military Laboratory Medical Schools, Cambridge, as assistant pathologist. She left the Army service in April, 1920, and became junior assistant in the Pathological Institute of the Royal Infirmary, Glasgow, under Prof. Tschacher. Two years' work there was followed by her appointment as assistant pathologist to the Victoria Infirmary, Glasgow, where she worked for three years, and in 1925 was then appointed assistant pathologist to Sheffield University and the Jessop Hospital for Women. In 1923 she obtained the Cambridge D.P.H. For the past 18 years Miss Kirk has worked at the Jessop Hospital, and with the



passing of the years she was constantly enlarging her knowledge of gynaecological pathology, keeping pace with the many advances that have taken place during this time. Her work was conscientiously carried out. Her opinion on specimens submitted to her was carefully considered before being expressed. It was always sound, and was greatly valued by the hospital staff. There is no doubt that the fine work she has done for so many years was a most important factor in the success of the hospital practice. Apart from her medical work, Miss Kirk was greatly interested in social problems, and devoted much time and thought to them.

Dr. ALFRED JOSEPH PICKWORTH, who died in retirement on Dec. 23, aged 86, had practised for over half a century in the Lakenheath district of Suffolk. He came of a medical family, for his grandfather, two uncles, and a son have also been members of the profession. He was born in Lincolnshire and went to school at Bath, and studied medicine at Liverpool, qualifying as L.R.C.P.Ed. and L.R.F.P.S.Glas. in 1880. Four years later he went to Lakenheath, where he became not only the medical attendant and adviser of the people of his large practice but also took duty as a Methodist minister, and his medical and religious work were closely intertwined. Dr. Pickworth was prominent in local public life, a J.P. for Suffolk, and in 1935 the County Council advanced him from the position of a councillor to that of an alderman. He was a governor of Addenbrooke's Hospital, Cambridge, and for years attended the Mildenhall Cottage Hospital. On his retirement from medical practice a large gathering assembled to do him honour and make a presentation to him and Mrs. Pickworth. He was a member of the B.M.A. from 1881 to 1930, but took no part in medical politics.

We regret to announce that Dr. JOHN CHARLES WILLIAM GRAHAM, a well-known Cambridge practitioner, died on Jan. 1, aged 72. From Brighton College he went up to Trinity College, Cambridge, where he distinguished himself as a swimmer and member of the University water-polo team. Having taken the B.A. in 1893, he went to St. Thomas's Hospital for clinical study, qualifying in 1899, after which he returned to Cambridge as house-surgeon at Addenbrooke's Hospital. He worked for a time at High Wycombe and then returned again to Cambridge and set up practice, taking his M.D. in 1909. He was chiefly interested in ophthalmology and acted as clinical assistant at Addenbrooke's for many years, and also as consulting ophthalmic surgeon to the Huntingdon County Hospital. During the last war he served on the staff of the 1st Eastern General Hospital, retiring in 1919 with the rank of major, R.A.M.C.(T.F.). Dr. Graham was a member of the B.M.A. for over 40 years and took an active interest in its affairs. He represented the Cambs and Hunts Branch at a number of Annual Meetings.

By the death of Lieut.-Col. A. E. J. LISTER I have lost a life-long friend, writes Mr. J. Cole Marshall. We were at Dean Close School, Cheltenham, together, and then we both went on to St. Bartholomew's Hospital, where Lister passed all his examinations with ease, also taking the Brackenbury Medal—the blue ribbon of the surgical scholarships. Lister was also prosector at the Royal College of Surgeons. After graduating M.B. and B.S.Lond. he took his final Fellowship, passing this examination under age. He then decided to enter the Indian Medical Service, obtaining first place in the entrance examination and passing out first, being presented with the bronze medal for efficiency. Soon after starting his career in India Lister was attached to the 27th Punjab, and at the Battle of Jid Boli he rescued a wounded officer under fire when the stretcher-bearers had bolted; he not only saved the officer's life but continued his arm being amputated, thus allowing him to continue his career and eventually to become a general in the Indian Army. In this campaign Lister caught a fever which undermined his health for the rest of his career. I would especially like to dwell on his ophthalmic work. On returning from the campaign he was attached to the staff of H.E. the Commander-in-Chief of the Indian Army, Sir C. MacCreagh, and remained with him until 1913. During his leave he studied ophthalmology in Vienna under Prof. Fuchs, and also worked at Zurich and Paris; being very proficient in languages he naturally became well known in those universities. During these years he worked with Lieut.-Col. Henry Smith at Jullundur and Amritsar; he wrote an appendix to Colonel Smith's book on treatment of cataract by the intracapsular method, and also analysed the cases of vitreous loss in this operation. He also wrote a paper on conjunctival flaps and their use in the intracapsular operation. Lister was a good and quick operator and had a great experience in cataract. In 1913 he inaugurated the ophthalmic department of King George's Hospital at Lucknow. He first was appointed professor of physiology, and then, in recognition of the way he developed the ophthalmic depart-

ment, was made first professor of ophthalmology. In 1920, owing to the great increase of eye work, a new wing was in course of construction, but though Lister had hoped to return to India, in 1920 he had to retire from the I.M.S. because of ill-health. His ophthalmic work in India was greatly appreciated; he was appointed ophthalmic surgeon to two Viceroy's and was consulted by many of the leading Indian Princes and high officials. On his return to England Lister started consulting practice and was appointed assistant surgeon to the Western Ophthalmic Hospital, but in 1923, owing to ill-health, he went to Bristol, where he was attached to the Bristol Eye Dispensary, reorganizing the work of the hospital. He worked at Bristol for many years and had a considerable consulting practice. In 1933 he retired from his hospital work because of poor health, but still took a great interest in the institution. Lister was a wonderfully kind-hearted man, and well loved by all who came in touch with him, both in his private and hospital work. Considering his ill-health it was marvellous how he carried on for so many years. In ophthalmic literature his name was well known, as he contributed to the Ophthalmic Section of the *Medical Annual* from 1922 to 1930. Lieut.-Col. Henry Smith, I.M.S., writes: After Col. A. E. J. Lister's return from sick leave from Somaliland fever early in his career he was posted to Jullundur, where I first became acquainted with him. From cantonment to my hospital at Jullundur city was 3 to 4 miles. While there I invited him to come daily to my hospital and work with me in his spare time, which he took full advantage of. The variety of clinical material was unsurpassed in quantity and quality, with only one boss—myself. How he enjoyed the hard daily steady work! A true and loyal friend, an honest and courageous man, and the finest Christian I ever met. I mourn his loss.

## The Services

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Flying Officer Robert Dunlop, R.A.F.V.R., and the awards of the George Medal to Capt. C. E. L. Allen, S.A.A.F., and Flying Officer G. H. Dhenin, R.A.F.V.R., and the B.E.M. (Military Division) to Corporals C. V. Burton, R.A.F.V.R., and W. J. Lush. The announcements read as follows:

F/O ROBERT DUNLOP, R.A.F.V.R., and Cpl C V BURTON.

One afternoon in July, 1943, an aircraft crashed on landing and caught fire. The pilot and a passenger, who were the only occupants, were both thrown out of the cockpit and trapped beneath the wreckage of a wing. Cpl Burton, assisted by two other airmen, attempted to rescue the occupants, but all were driven back by the heat. Undeterred, Burton made another attempt alone, and this time succeeded in partially lifting the burning wreckage of the wing and he then dragged the pilot clear. F/O Dunlop, a medical officer, had arrived at the scene of the accident, and on being informed that the passenger was still under the wreckage, attempted to release him. While this was being done an explosion occurred, but F/O Dunlop continued his rescue efforts and dragged the passenger clear of the aircraft. This officer and airman displayed considerable bravery.

Capt COLIN ERNEST LEWER ALLEN, S.A.A.F.

One night in July, 1943, an aircraft, with a crew of four, collided with a stationary aircraft and two trucks when taking off. The bomber, which was carrying six 250-lb. bombs, burst into flames. Capt. Allen, the squadron medical officer, after instructing an orderly to bring a near-by ambulance to the aircraft, proceeded to the scene of the accident. Before he was able to get to the wreckage he saw one member of the bomber's crew stumble away to safety. Then the starboard petrol tank exploded. On reaching the aircraft Capt. Allen saw the pilot, who was injured and in a dazed condition, in the nose of the aircraft endeavouring to locate the observer. After removing the pilot Capt. Allen groped in the nose of the bomber, but was unable to find the observer. He continued his search around and over the port wing, which was well ablaze, in an endeavour to find the two remaining members of the crew. Fully aware of the danger from the possible explosion of the bombs, Capt. Allen remained in the vicinity, and finally, with an assistant, he removed the body of the gunner, which was found lying partly under the wing beside the blazing fuselage. Shortly afterwards three of the bombs exploded. Capt. Allen displayed great courage and devotion to duty.

F/O GEOFFREY HOWARD DHENIN, R.A.F.V.R., and Cpl. W. J. LUSH

One night in October, 1943, an aircraft, which had sustained damage during an attack against Hanover, crashed near an airfield. The aircraft disintegrated on impact and immediately burst into flames. The rear gunner was injured and trapped in his crushed turret, being pinned down by the remains of the tail unit and the rear of the fuselage. A high-explosive bomb was in the blazing wreckage some 10 yards away from the gunner. F/O Dhenin, the station medical officer, and Cpl. Lush, a gunner, hastened to the scene of the accident. Although fully aware that the heat might cause the bomb to detonate at any moment F/O Dhenin worked for over half an hour to relieve the injured airman's pain and, assisted by Cpl. Lush, endeavoured to release him. Their efforts to extricate the gunner were, however, unavailing. A mobile crane was brought to the scene and the mass of wreckage was lifted clear of the ground. Displaying complete disregard for his own safety, F/O Dhenin then crawled under the wreckage and released the trapped airman.

thereby enabling other helpers to drag him to safety. F/O Dhenin and Cpl. Lush showed fine courage and determination in circumstances of great danger.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in the Middle East:

Brig. (Temp.) J. Walker, C.B.E., M.C.; Col. H. J. A. Longmore, late R.A.M.C., Brig. (acting) J. M. Macfie, O.B.E., M.C., Brig. (local) D. McAlpine; Col. (Temp.) D. Mackie, M.C., T.D., D. McVicker, M.C.; Col. R. H. Mollan, O.B.E., M.C., T. M. Pirrie, M.C., and W. Russell, M.C.; Col. (acting) C. Donald, C. E. Eccles, and R. Marnham; Majors (Temp. Lieut.-Cols.) I. Aird, C. Bainbridge, A. MacC. Campbell, A. M. Critchley, C. R. Croft, C. D. Evans, J. C. Hawksley, R. Johnston, P. J. Jory, D.S.O., J. M. Matheson, T. Parr, T. McK. Robb, J. R. Robertson, E. J. Selby, and W. L. Spencer-Cox, M.C.; Capt. (Temp. Majors) (acting Lieut.-Cols.) S. Brown (killed in action), and F. C. Mayo; Major (acting Lieut.-Col.) D. H. Young and Major W. H. Milligan; Capt. (Temp. Majors) J. H. L. Easton, T. J. Guinan, T. G. S. James, P. H. Jobson, R. L. Macpherson, R. J. Millbank, and P. D. Stewart; Capt. (acting Major) S. A. Jenkins; Capt. J. P. Baird, S. H. Campbell, W. G. Graham, A. P. Grant, J. N. T. Hutton, D. H. Jones, M. W. Lloyd-Owen, H. K. Lucas, D. D. Muir, C. F. Munro, R. L. Orchardson, W. D. B. Pettigrew, D. B. Ramsay, E. R. B. Reynolds, D. R. Sandison, M. A. Stammers, H. G. Skinner, F. M. Smith, M.C., G. A. Stephen, J. W. M. Sutherland, D. J. Waisterston, M.B.E., D. R. P. Wilkie, C. A. Young, and C. F. Young, M.C.; Lieut. (Temp. Capt.) T. Wright, R.A.M.C.; Capt. (Temp. Majors) C. H. Bliss, P. T. Joseph, and M. Sarwar; Capt. K. Partap Singh and S. C. P. Sinha; and Lieut. D. S. B. Stephens, I.M.S.; Subadar-Major K. S. Bedi, Bahadur, O.B.I., Subadar M. Singh, and Jemadar C. Hans, I.M.D.

### CASUALTIES IN THE MEDICAL SERVICES

Died.—Lieut.-Col. A. M. V. Hesterlow, I.M.S.

Wounded.—War Subs. Col. E. C. Beddows, M.C., Temp. Lieut.-Col. W. D. F. Lytle, War Subs. Capt. T. P. W. McCarthy, R.A.M.C.

### DEATHS IN THE SERVICES

By the death of Lieut.-Col. ROGER PARKER WILSON, C.I.E., I.M.S., on Dec. 12 at Southport the Indian Medical Service loses a distinguished and popular member. He was educated at University College, Liverpool, and St. Bartholomew's Hospital, London, passed the Conjoint finals in 1893, and took a good place at the entrance examination to the I.M.S. in 1896. Later he obtained the Cambridge D.P.H. in 1900 and the F.R.C.S.Eng. in 1912 while on leave. He served with the Indian Army until 1903, and was then appointed to the Bengal Civil Medical Service. After holding posts as civil surgeon in various districts he went to Calcutta to the important appointment of superintendent of the Campbell Medical School from 1913 to 1918, when he was promoted to be surgeon to Calcutta Medical College Hospital and successively professor of clinical surgery and professor of surgery in the Medical College. There he found scope for his abilities both professional and administrative, including examinerships, and as president of the Bengal State Medical Faculty and Council of Medical Registration. This led to his acting as Surgeon-General to the Government of Bengal in 1922 and 1925, and he was unfortunate in not obtaining a permanent administrative post before being precluded from further promotion by the age retiring rules. His various services were rewarded by the C.I.E. in 1925 and by his appointment as Honorary Surgeon to H.E. the Viceroy in 1920. He was joint author, with Rogers, of a paper on two cases of liver abscess treated by aspiration after early diagnosis by the blood changes—the first trial of the method now almost universally adopted. (*B.M.J.*, June 6, 1906.) Wilson was a most loyal colleague and was much liked by all his colleagues. In his young days he was a fine athlete and a good football player. Latterly he was much crippled by illness, but never lost his cheerfulness; he will be much missed by his many friends.

Lieut.-Col. JOHN LEWIS MACRAE, I.M.S.(ret.), died at Stornoway on Nov. 25, aged 75. He was educated at Blairlodge School and the University of Edinburgh, where he qualified M.B., C.M. in 1890. He entered the I.M.S. in 1891, and after military service in Burma and with the Peking Relief Expedition he became a district medical officer in the Madras Presidency and was stationed at Mercara as civil surgeon of Coorg for many years. He retired in 1921.

## Universities and Colleges

### UNIVERSITY OF GLASGOW

A graduation ceremony was held on Jan. 15, when the following medical degrees were conferred:

M.D.—K. S. Alstead, J. Black, A. A. L. Goodall, A. C. Pearman.  
Ph.D.—(in the Faculty of Medicine): Albert Sharman, M.D.  
M.B., Ch.B.—R. McL. Archibald, D. Beaton, Ellen S. Bell, G. M. Burns, R. Burns, C. Cameron-Mowat, K. D. Cochran, L. N. Cook, Margaret P. Delahan, Nialan C. Dick, Mary C. Douglas, A. M. S. Elfehah, Margaret J. W. Finlayson, J. Frazer, T. M. Gardner, Mary E. Hamilton, E. W. Hutcheson, P. McCulloch, D. A. MacDonald, W. G. McEwen, T. S. Macfarlane, M. M. Macgregor, J. Maclean, R. W. McKie, R. Meldrum, Katherine G. Miller, M. S. Miller, R. F. Miller, R. Mitchell, Alexandra Moffat, Lillian McA. Money, B. Moscow, Monica M. A. Murphy, W. L. Newbigging, Hetty B. Ockrim, W. G. Paterson, H. A. Rankin, F. E. Roche, L. M. K. M. Scrimgeour, J. Shapiro, Catherine G. Simpson, J. M. Sinclair, Margaret F. Smith, D. J. Stewart, E. McG. Stirling, Agnes C. Sutherland, R. Thomson, J. D. Wilson, Marjorie B. Wilson, J. D. Wimbis.

<sup>1</sup> With high commendation. <sup>2</sup> With commendation.

## Medical Notes in Parliament

### White Paper on Social Security

On Jan. 18 Mr. CHURCHILL, replying to Mr. Graham White said he hoped that the White Paper on Social Security would be ready about the end of February or early March, but he could not pledge himself to any particular date.

### Awards to R.A.M.C.

On Jan. 18 Sir JAMES GRIGG told Sir Harold Webbe that 204 awards and decorations other than for cases of conspicuous gallantry had been made to R.A.M.C. officers, and 22 to R.A.M.C. other ranks. In addition 499 officers and 381 other ranks had been mentioned in dispatches. No citations accompanied recommendations for mentions, and it was impossible to say how many of them were for cases other than gallantry.

### University Grants Committee

On Jan. 18 Sir JOHN ANDERSON informed Mr. Harvey that no change had been made in the terms of reference of the University Grants Committee, which were: "To inquire into the financial needs of university education in the United Kingdom, and to advise the Government as to the application of any grants that may be made by Parliament towards meeting them." It seemed to him that these terms of reference were wide enough to enable the committee to report on any problem on which the Government might need advice in connexion with the making of grants to universities. There had grown up between the committee and the universities an accepted custom of constant informal consultation on matters of university policy, and it was contemplated that this would be continued and developed. Mr. HARVEY asked if there was any possibility of the formation of a university council in the not distant future to make that consultation more effective, but Sir JOHN ANDERSON replied that he could not say anything about that.

### Registrar-General's Health Statistics

On Jan. 18 Major MARKHAM asked the Minister of Health whether he was aware that no detailed health statistics had been published for several years; and if he would give authority for the issue of up-to-date civil and medical tables or statistical reviews to supplement the summary reports of the Ministry of Health. Mr. WILLINK said that the Medical Section (Part I) of the Registrar-General's Statistical Review for 1940 was published last September and the Civil Section (Part II) of the 1939 Review last January. Corresponding volumes for subsequent years were being issued as soon as possible; but their production was conditioned by the very restricted printing facilities now available for this class of matter. During the present extreme shortage of paper the volumes could not be placed on public sale, but the statistics might be consulted at the Office of the Registrar-General, from whom a temporary loan of any volumes desired could be had by those having occasion to refer to them.

### Medical Recruitment in East Sussex

On Jan. 18 Rear-Admiral BEAMISH asked the Minister of Health if he was aware that the Central Medical War Committee was working a scheme with his Ministry which ignored the representations of the Local Medical War Committees and other committees concerned in East Sussex and, by designating too many local doctors for military service, was causing overwork and anxiety for those concerned with the health of the local population; and if he would adjust the situation. Mr. WILLINK replied that Admiral Beamish was no doubt referring to a plan which he had asked the Central Medical War Committee to put into operation on the recommendation of the Medical Personnel (Priority) Committee as one of the steps to obtain the number of doctors which the Government had decided to assign to the Forces. The plan applied to any area which had not satisfied the quota of doctors required of it—that was to say, which retained a higher proportion of general practitioners to population than that normally adopted for the purpose of calculating the quota. The Central Medical War Committee issued recruitment notices to doctors of military age up to the number required to make up the quota, but it was open to the Local Medical War Committee, as well as to the doctors themselves and any employing authorities, to make representations to the Central Committee against the recruitment. These representations were then considered fully by the Central Committee, at an oral hearing if so desired, before a final decision was reached.

## Medical News

Prof. B. A. McSwiney, Sc.D., M.B., will deliver the Oliver-Sharpey Lectures before the Royal College of Physicians of London on Thursdays, March 2 and 9, at 4 p.m., at the College, Pall Mall East. His subject is "Affluent Fibres of the Abdominal Viscera."

At the meeting of the Medical Society for the Study of Venereal Diseases to be held at 11, Chandos Street, Cavendish Square, W., to-day (Saturday, Jan. 29) at 2.30 p.m., a general discussion on "The Intensive Treatment of Early Syphilis" will be opened by Lieut.-Col. D. M. Pillsbury, senior consultant in dermatology, U.S. Army, in association with other American medical officers. At the meeting on Feb. 26 Col. J. E. Gordon of the U.S. Army Medical Corps will give an address on "The Prophylaxis of Venereal Disease."

The Friday evening discourses to be given at 5 o'clock at the Royal Institution, 21, Albemarle Street, W.1, include one on Brain Rhythms by Prof. E. D. Adrian, M.D., F.R.S., on Feb. 4; one on the Medical and Surgical Achievement of Soviet Russia in War by Mr. E. Rock Carling, F.R.C.S., on Feb. 25; and one on Habit and Evolution by Prof. D. M. S. Watson, D.Sc., F.R.S., on March 10. The following courses of lectures have been announced: Modern Developments in Dairy Science by Prof. H. D. Kay, D.Sc., on Feb. 1 and 8, at 5.15 p.m.; on Fungi and Modern Affairs by J. Ramsbottom, D.Sc., on Feb. 15, 22, and 29, at 5.15 p.m.; on the Mode of Action of Some Vitamins by Prof. A. R. Todd, D.Sc., F.R.S., on March 7 and 14, at 5.15 p.m.; on Chemical Factors in Nervous Effects by Sir Henry Dale, M.D., P.R.S., on March 21 and 28, at 5.15 p.m.; and on Food Fads and Food Fallacies by Sir Jack Drummond, D.Sc., on Feb. 24, March 2 and 9, at 2.30 p.m.

On Wednesday, Feb. 9, at 2.30 p.m., the Nutrition Panel of the Society of Chemical Industry will hold a meeting in the rooms of the Chemical Society, 56, Victoria Street, Westminster, London, S.W.1, when Mr. F. A. Robinson, M.Sc., F.I.C., will read a paper on the vitamin B<sub>6</sub> complex. The speaker will discuss not only the properties and distribution of these vitamins, but also their biological functions so far as they are understood.

On Feb. 10 at 7 p.m. at the House of the Pharmaceutical Society of Great Britain, 17, Bloomsbury Square, London, W.C.1, the Harrison Lectureship Medal will be presented to Mr. Arthur James Ewins, D.Sc., F.R.S. Following the presentation, Dr. Ewins will deliver the Harrison Memorial Lecture on "Progress and Problems of Chemotherapy." The development of chemotherapy in relation to pharmacy will be reviewed and attention drawn to some of the problems in the field of chemotherapy which still await solution. It is hoped that there will be a large attendance of members and friends. Refreshments will be served after the meeting.

Imperial Chemical (Pharmaceuticals) Ltd. ask us to print the following statement: It has recently been brought to our notice that toxic symptoms have occurred following anaesthesia in which trileine has been used with a closed circuit. Pending a full investigation of this matter, which is now being conducted, we would suggest that trileine should not be used with a closed circuit.

The Therapeutic Research Corporation of Great Britain Ltd. has elected the following officers for the year 1944: Chairman, Board of Directors, Mr. H. Jephcott (Glaxo Laboratories Ltd.); Deputy Chairman, Dr. F. H. Carr (British Drug Houses Ltd.); Chairman, Research Panel, Dr. A. J. Ewins (May and Baker Ltd.); Deputy Chairman, Mr. F. A. Robinson (Glaxo Laboratories, Ltd.). The Corporation has appointed Dr. Frank Hartley as secretary to take up duties early in 1944. The new offices of the Corporation are at General Buildings, 99, Aldwych, W.C.2.

Mr. Henry Berry, chairman of the Metropolitan Water Board, in a lecture on London's water supply problems before the Royal Society of Arts on Jan. 19, said that the use of larger quantities of chlorine for purification enabled the capital to escape any typhoid epidemic during the heavy air-raid period. At present all the Board's water supplies, whether from river or well, were chlorinated, but he would not be surprised if after the war the Board and other water authorities gave more consideration to the use of ozone as a purifying agent.

A meeting of the Court of Directors of the Society for Relief of Widows and Orphans of Medical Men was held on Jan. 5, with the president, Dr. R. A. Young, in the chair. A sum of £1,965 was voted to pay the half-yearly grants to the fifty-six widows in receipt of relief. Relief is granted only to the necessitous widows of deceased members, or their orphans if under the age of 16. Membership is open to any registered medical man who at the time of his election is residing within a twenty-mile radius of Charing Cross. Application forms for membership may be obtained from the secretary of the Society, 11, Chandos Street, Cavendish Square, W.1.

On Jan. 1 the Bristol Hospitals Fund (Inc.) and the Bristol Aeroplane Company Employees' Hospital Fund amalgamated and merged their funds and interests. As soon as legal formalities can be completed the Fund will be reconstituted as Bristol Hospitals Amalgamated Fund (Inc.), but meantime the Bristol Hospitals Fund (Inc.) will be legally responsible for the affairs of both the existing funds. Address for all communications: Royal London House, Queen Charlotte Street, Bristol, 1.

The latest Order on the control of liver, the Liver Extract (Regulation of Use) Order, 1944, which came into force on Jan. 8, permits the use of proteolysed extract as well as the injectable extract. The general effect of the Order is that liver extract, including desiccated liver, must not be used except in the treatment of pernicious or other megalocytic anaemias, and then only in the form of the injectable and proteolysed liver extract.

The Leverhulme Trustees invite applications for fellowships and grants in aid of research from British-born senior workers prevented by routine duties or pressure of other work from carrying out research. Forms may be had from the secretary, Dr. L. Haden Guest, M.P., Leverhulme Research Fellowships, Unilever House, Blackfriars, E.C.4. They must be returned by March 1.

The following resolution was adopted by the Council of the Malthusian League on Dec. 18, 1943: "Whereas there is an agitation for increasing the annual number of births in Great Britain; and whereas the Government has issued a White Paper (Cmd. 6358) which states that 700,000 births per annum, being the number annually born at the outbreak of the war, would maintain the present population for ever; and whereas no responsible person has advocated an increase of our present population: therefore the Malthusian League earnestly requests the Government to take no steps whatever which might lead to the increase of the annual number of births, especially among the poorer sections of the community, which are already multiplying very rapidly."

The British Homoeopathic Society has lately become incorporated into the Faculty of Homoeopathy, and an inauguration conference was held in London on Jan. 21 and 22, with the president, Sir John Weir, in the chair.

The issue of the *Indian Medical Gazette* for October, 1943, is a special tuberculosis number.

On Tuesday, Jan. 24, at the London Hospital, Whitechapel, in the presence of Sir John Mann, Capt. H. Brierley, and many distinguished physicians and surgeons, a tablet was unveiled to the memory of four radiographers—Ernest Harnack, Reginald Blackhall, Ernest Wilson, and Harold Suggars—who, to quote the inscription on the tablet, "devoted their lives to healing. Their work in the development of the science of x-rays cost them their health. This they gladly gave in the service of the London Hospital." Dr. J. H. Sequeira, in a memorial speech, briefly traced the history of x-ray development from the time of Roentgen. He then paid tribute to the four pioneers, whose "first thought was of their work and their last of themselves." Ernest Harnack joined the hospital staff as a clerk and later had the advantage of being trained by Dr. (now Viscount) Dawson. He started taking radiographs in 1896 with a primitive apparatus, and later he and Dr. Sequeira were able to use a more elaborate apparatus in the post-mortem room, where films were made to determine the value of the rays in diagnosing chest and abdominal diseases. Harnack was the first member of the hospital staff to suffer from x-ray dermatitis, and in 1909 he had to relinquish his work. Despite grave mutilation he lived until 1943, dying at the age of 72. Ernest Wilson, who joined the staff in 1899, contracted dermatitis of the fingers after only one year. He continued at work until 1904, but died of rapid cancer in the following year at the age of 39. Reginald Blackhall, who joined the staff when only 18, was particularly successful in stamping out ringworm among the children of the district. With Dr. Sequeira he carried out experiments with x-ray filters. In 1925 he succumbed to cancer at the age of 44. By the time Harold Suggars joined the staff in 1903 some of the risks of x-ray exposure were known, and he was the first worker to wear lead-lined gloves and body protection. Nevertheless he developed cancers on the body, face, and eyelid. He became almost totally blind from double cataract and died in 1943, showing amazingly cheerful patience and courage in his misfortune. "While we all admire courage," Dr. Sequeira said, "perhaps the most precious possession of all is that secret strength which shows the human spirit to be indestructible in the face of disaster."

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 8.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	92	2	28	12	2	87	3	18	7	3
Deaths .. ..	22	3	1	—	—	36	1	—	—	—
Diphtheria .. ..	661	38	179	125	32	841	46	238	89	29
Deaths .. ..	22	2	5	5	1	36	1	2	5	1
Dysentery .. ..	165	22	37	—	—	119	23	32	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	1	—	—	1	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	58	14	6	—	—	63	12	4
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	44	11	10	11	3	49	5	7	13	6
Deaths .. ..	—	—	—	10	—	—	—	—	11	—
Measles .. ..	515	82	43	82	3	14,153	698	525	11	17
Deaths .. ..	—	—	—	—	—	23	2	1	—	—
Ophthalmia neonatorum .. ..	64	6	15	1	—	77	2	25	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	4	—	1 (B)	1	—	5	—	3	—	4
Deaths .. ..	1 (B)	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,608	140	79	44	6	1,091	67	14	14	2
Deaths (from influenza) .. ..	255	31	21	5	2	65	4	3	1	—
Pneumonia, primary .. ..	—	—	516	28	—	—	—	216	26	2
Deaths .. ..	—	85	—	28	17	—	—	27	5	—
Polio-encephalitis, acute .. ..	1	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute .. ..	3	—	3	1	1	2	1	2	10	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	4	12	—	—	—	1	27	2	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	147	11	13	1	5	125	9	20	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,791	108	220	37	87	1,808	134	346	42	52
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	4	—	2	10	3	8	2	5	7	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,793	195	121	76	25	1,302	86	76	45	6
Deaths .. ..	7	1	2	1	1	11	—	7	1	—
Deaths (0-1 year) .. ..	425	75	120	61	26	407	39	81	48	33
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	6,034	977	839	339	162	5,184	774	724	300	141
Annual death rate (per 1,000 persons living) .. ..	—	—	19.3	22.1	—	—	—	16.3	19.7	—
Live births .. ..	7,001	854	1025	407	281	6,403	761	978	359	298
Annual rate per 1,000 persons living .. ..	—	—	20.8	26.6	—	—	—	20.0	23.6	—
Stillbirths .. ..	228	29	31	—	—	266	25	38	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	—	—	—	—	—	37	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In *England and Wales* during the week the notifications of whooping-cough went up by 284, of diphtheria by 83, of dysentery by 76, and of cerebrospinal fever by 19, but there were 389 fewer cases of acute pneumonia, 238 of scarlet fever, and 31 of measles.

Influenza deaths in the great towns dropped to 255. (For the week ending Jan. 15 the figure is 197.) The largest returns were London 31, Sheffield 13, Liverpool 12.

Scarlet fever was down by 50 cases in Middlesex, by 42 in Lancashire, and by 40 in London; the only rises of note were in Staffordshire 27, and in Durham 22. The rise in diphtheria occurred mainly in the north, especially in Yorks West Riding which recorded 40 more cases than last week, Durham with 34 more, and Lancashire with an increase of 28. Whooping-cough notifications were up by 38 in Essex. Returns for measles were fairly steady, the only variation of note being in London, where the notifications have doubled in a fortnight.

Dysentery notifications were almost twice those of the preceding week. Two of the largest new outbreaks were in Sussex 27 (Bognor Regis U.D. 4 and Chichester R.D. 23) and the Port Health District of Liverpool 13. The other large centres of infection were London 22, Lancashire 22, and Surrey 15.

Notifications of cerebrospinal fever have risen from 53 to 92 during the past two weeks: a rise during the first quarter of the year has in recent years been a feature of this disease.

In *Scotland* whooping-cough notifications were up by 48, measles by 25, and diphtheria by 8, while scarlet fever was down by 36 cases, dysentery by 34, and acute primary pneumonia by 19. One-third of the cases of dysentery were notified in Edinburgh.

In *Eire* there was a general rise in the incidence of infectious diseases—diphtheria by 35, whooping-cough by 33, and scarlet fever by 11 cases. Of the 82 notifications of measles 52 were reported from Dublin C.B. and 17 from Roscommon, Castlereagh R.D.

## Quarterly Returns

*England and Wales.*—The birth rate during the third quarter of 1943 was 16.2 per 1,000 and was the highest rate for a September quarter since 1930. Infant mortality was 40 per 1,000 live births, this being the lowest quarterly rate ever recorded, and 4 below the average of the ten preceding third quarters. Stillbirths were 2.9% of the total births registered. Diarrhoea accounted for 998 deaths under 2 years of age, giving a rate of 5.9 per 1,000 live births, compared with 5.9, 5.9, 4.9, and 5.1 in the four preceding quarters. The general death rate was 9.4 per 1,000, compared with 9.3 for the third quarter of 1942, and an average of 10.0 for the September quarters of 1937-41. The natural increase—excess of births over deaths—was 70,839, and the increases during the September quarters of 1940-2 were 37,359, 46,285, and 71,000 respectively. The marriage rate, 15.6 per 1,000, is the lowest rate for a third quarter since 1917: 162,908 persons married in the quarter, 28,518 fewer than in the third quarter of 1942, and 87,947 below the average of the five September quarters before 1942.

*Northern Ireland.*—During the September quarter the births were equivalent to a rate of 23.8 per 1,000, being 2.7 above the average for the third quarters of 1938-42. Infant mortality was 76 per 1,000 registered births, and was 12 above the average of corresponding quarters of the five preceding years. The general death rate was 11.2 per 1,000, and was 0.3 below the average of September quarters for the preceding five years. The death rate from the principal infectious diseases was 0.75 per 1,000, compared with the five-year average of 0.57. This rise was due to diarrhoea and enteritis under 2 years; 167 deaths were attributed to this cause, against an average of 106. Deaths from pulmonary tuberculosis were 188, and 67 from other forms of tuberculosis; the averages of the five preceding third quarters were 211 and 71.

## Week Ending January 15

The returns of the notifications of infectious diseases in *England and Wales* during the week included: scarlet fever 1,747, whooping-cough 2,023, diphtheria 673, measles 559, acute pneumonia 1,294, cerebrospinal fever 64, dysentery 175, paratyphoid 4, typhoid 1. Influenza deaths in the large towns numbered 197.

F. S. Cheever, B. B. Breese, and H. C. Upham (*Ann. intern. Med.*, 1943, 19, 602) found that sulphadiazine was effective in clearing the nasopharynx of meningococci in 161 meningococcus carriers receiving 8 g. of the drug over a period of 72 hours. No untoward results of the drug were noted.

## Letters, Notes, and Answers

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### ANY QUESTIONS?

#### Which Sulphonamide?

*Q.—In view of the introduction of new sulphonamides, I should be glad to know which is now considered to be preferable for the treatment of pneumonia due (a) in the pneumococcus, and (b) to other organisms, such as the staphylococcus, streptococcus, Friedländer's bacillus, etc.*

*A.—*No dogmatic answer to this question is justified. There is neither experimental nor adequate clinical evidence on which to assess the relative merits of the newer sulphonamide compounds, particularly for the less common forms of pneumonia. All are believed to act in the same way, and choice may depend not so much on specificity of effect on a particular micro-organism as on some other and perhaps subsidiary property.

With the exception of sulphathiazole, all compounds in common use have a satisfactory action on the pneumococcus. Sulphapyridine, the first to achieve this, and still the most widely used, has a drawback in its strong tendency to produce nausea and vomiting. This is overcome in sulphadiazine, which achieves much the same therapeutic result with far less discomfort to the patient. Sulphamezathine closely resembles sulphadiazine, and has the further advantage of greater solubility, both of the drug itself and of its acetyl compound; absorption is thus rather more rapid and the deposition of crystals in the urinary tract, causing haematuria or ureteric obstruction, is most unlikely to occur with this drug. It is also rather more slowly excreted, and less frequent dosage will therefore serve.

There is good evidence of the efficacy of sulphapyridine in infections due to *H. influenzae*, of sulphathiazole for staphylococcal infections, and of sulphadiazine for those due to Friedländer's bacillus. This is not to say that other new compounds will not serve equally well. Haemolytic streptococcal infections respond to any of the sulphonamides, including sulphathiazole, but in pneumonia the choice should perhaps fall on one with the least possible tendency to cause nausea or cyanosis, such as sulphadiazine or sulphamezathine.

#### Menopausal Flushes

*Q.—I should be grateful for some information on the treatment of the hot flushes and sweatings incidental to the menopausal changes. In the case I have in mind the attacks occur at night—often as many as six—and are very distressing.*

*A.—*The specific treatment is by means of oestrogens. A previous answer on oestrogen therapy for menopausal symptoms (*Journal*, Aug. 7, 1943, p. 190) was, by reason of its brevity, open to some misunderstanding, and attracted some valid criticism from Dr. P. M. F. Bishop in a letter published in the *Journal* on Aug. 21, 1943, p. 244. The original answer and this letter should be consulted. Whatever differences of opinion there may be in other respects, all are agreed that the patient should be given the smallest dose of oestrogen which will relieve symptoms, the actual dose employed being a matter of trial in individual cases. Natural or synthetic oestrogens may be employed, the latter being relatively more powerful in their effects, especially when administered orally. In this particular case only a very small dose should be required, and oestrone or oestrone benzoate 0.1 mg. or 0.2 mg. t.d.s. by mouth should be tried in the first place. If this is inadequate it can be cautiously increased, and, if need be, supplemented by a weekly intramuscular injection of 5 mg. oestradiol benzoate. Alternatively, and again if a large dose proves necessary, a synthetic oestrogen such as stilboestrol 0.5 mg. once or twice daily by mouth can be employed. The object should be to ameliorate symptoms rather than relieve them completely. Having arrived at the smallest dose which achieves this object, maintain that dose for two to three weeks, and then gradually reduce over the course of several weeks. By the end of three months it should be possible to discontinue

treatment completely. An essential feature of the treatment is the regular and gradual reduction in dosage—thereby allowing the body to readjust itself to the altered endocrine balance. Symptoms will recur if treatment is stopped suddenly. If for any reason oestrogen therapy is contraindicated then a small dose of thyroid, or a large dose of calcium, or vitamin E, is worthy of trial.

#### "Booster" Doses in Typhus Immunization

*Q.—An antigen prepared from typhus rickettsia grown in the yolk sac of developing chicks is being extensively used for immunization purposes. For the initial inoculation the three graduated doses are given at weekly intervals. Thereafter three-monthly "booster" doses are recommended. Is there in fact any weight of scientific data to back the recommendation that reinoculation should be performed at such very short intervals? I know of no other active immunization procedure which demands four "booster" doses per annum to maintain immunity.*

*A.—*Immunization against louse-borne typhus is still in the experimental stage. Rickettsial vaccines are now employed on a large scale for the first time, and so far little is known about their prophylactic value in the field. Reports from German sources indicate that inoculation with the available vaccines, including those made from infected yolk sacs, does not prevent subsequent infection, but greatly reduces the severity of the disease. It is not known for how long this state of relative immunity lasts following the three doses that are given in the course of the initial inoculation. The laboratories issuing yolk-sac vaccines recommend reinoculation at various intervals—for instance, every four to six months, or every three to nine months. In view of the high fatality rate recently observed in some localities in cases of louse-borne typhus it seems to be a wise decision to adopt the short intervals for reinoculations so long as there is serious danger of infection. It would not be safe to rely on experiences with other immunization procedures. Rickettsiae occupy a position quite separate from the bacteria and the filterable viruses, and the conditions governing immunity to rickettsial infections may differ in many respects from those obtaining in the other groups of micro-organisms.

#### The "Stammering Bladder"

*Q.—In his book "Sympathetic Nervous System in Disease" Sir Walter Langdon-Brown refers to the "stammering bladder." I should be glad to know just what the physical explanation of this condition is.*

*A.—*"Stammering" of the bladder is a neuromuscular incoordination, due to a disturbance of the balance between the sympathetic and parasympathetic innervation to that organ. This results in alternations of precipitate micturition with mild stranguary. It is therefore allied to other forms of neuromuscular incoordination.

#### Retarded Speech

*Q.—A boy aged 2½, healthy in every respect, can only utter animal sounds. He cannot speak any words, not even "mo" or "ta," although he appears to understand everything that is said to him. What treatment and advice should be given? The family history is quite good. Three other boys, aged 11, 7, and 5, in addition to the mother and father, are all in perfect health. These boys began to talk soon after they passed their first birthdays.*

*A.—*In all probability this child is either deaf or mentally defective, or has some type of congenital auditory aphasia. Despite the statement that he appears to understand everything, his hearing should be most carefully tested. He may be lip-reading. As regards his mentality more information is needed. Has he passed all his milestones at the proper time? When did he hold up his head?—sit up?—walk? Has he control of his bladder and rectum? If his hearing is normal and there is no evidence of mental retardation, then he may have some form of aphasia for which special coaching by a speech therapist is desirable. But it might be worth while waiting another six months or so, as there are occasional late talkers who suddenly begin to talk normally as late as 3 years or more.

#### Thyroid Treatment of Cretinism

*Q.—I have a patient, a cretin, aged 22. For two years she had thyroid treatment—between ages 2 and 4—and the mother then stopped the treatment because it made the child too excited. Judging from photographs I should say there had been definite improvement during the period of treatment. Of course she is now a stupid imbecile. Is there any use in trying thyroid now, and if so, what dose do you recommend?*

*A.—*With cretins who have not received treatment continuously, and who show signs of imbecility, the prognosis is bad, with or without the institution of hormone therapy. The administration of thyroid gland might convert a somewhat docile lethargic imbecile into a very active aggressive and awkward person, with resulting difficulties of management. Nevertheless, I do not consider it



justifiable to withhold thyroid treatment, as beneficial results are not impossible. Should the outcome be unsatisfactory it is always possible to cease thyroid therapy, and after some weeks the condition will probably return to the same state as before. Incidentally, even cretins who have received continuous and adequate therapy from birth or infancy may, after many years, show mental deterioration which is not amenable to hormone therapy. As regards the dosage of thyroid, in this and other cases it is determined by the general response and the pulse rate, but more accurately by the estimation of the basal metabolic rate.

#### Epididymitis

**Q.**—A male patient aged 73, active and working, consulted me five years ago for an acute epididymitis and has been under treatment ever since. Bacteriological examination revealed a "free growth of *B. coli*," and x rays showed the presence of two calculi in his prostate. No pyelitis. He passes urine freely, which contains threads. He was treated with mandelic acid and sulphonamides, with slight amelioration only, until he was put on hexamine, small doses of which make him fairly comfortable. He has now developed an acute epididymitis (second attack). He has arteriosclerosis, feels the cold very much, has persistent backache (relieved by massage), polyuria, and a painful tingling of the soles of his feet—no chilblains. Urine has always been alkaline; prostate not unduly enlarged. A recent report says urine is alkaline, specific gravity 1010, faint cloud of albumin, no sugar, small amount of pus, a small number of red blood cells, moderate deposit of amorphous phosphates, moderate numbers of triple phosphate crystals, a few squamous epithelial cells, large numbers of bacteria, and free growth of *B. coli*.

**A.**—The most urgent trouble at the present moment would appear to be the epididymitis, and even though sulphonamides did not appear of benefit previously, it would be worth while putting him on sulphathiazole now. Recurrent attacks of epididymitis are frequently associated with a fibrous prostate containing calculi, and in one or two cases I have known they were so frequent that I divided the vas in order to cut the path along which the infection travelled. As there appears to be no difficulty of micturition or retention, it is not necessary to operate on the prostate. It is not stated whether the pH was estimated when the patient was previously on mandelic acid, and as the urine is persistently alkaline supplementary doses of ammonium chloride would probably be necessary. Mandelic acid treatment is often reported to have failed when its failure is due to a pH of 5.5 not having been attained.

#### Halitosis

**Q.**—What suggestions have you for the treatment of halitosis in a woman of 40? Tonsils have been removed, teeth and gums appear quite normal, and she has no indigestion or constipation.

**A.**—Fetor oris is due to contamination of the expired air, and, if there is no disease of the nose, mouth, pharynx, or lungs, it is usually caused by food particles which are retained in the mouth and undergo putrefaction. Only occasionally is it the result of volatile chemicals, such as alcohol and acetone, which are excreted into the alveolar air from the circulating blood. It is probably never derived from the stomach except as a momentary effect during belching. The condition should be treated by careful brushing of the teeth and the use of mouth washes after every meal. If there is much furring of the tongue this should be cleaned with a soft toothbrush which should be applied gently and as far back as possible. The best chemical cleaners to use are hypochlorites such as Dakin's solution or chloramine compounds. Between meals the patient may be allowed to suck tablets containing 5 gr. potassium chlorate, but she should be warned of the danger of carrying these carelessly in the pockets as there is a risk of fire from contact with matches.

#### Decaying Teeth in Children

**Q.**—Children, ages ranging from 2 to 8, are often seen with one or more teeth in varying states of discoloration and decay. What principles should guide a doctor in advising filling or extracting in such cases?

**A.**—Unless the doctor has the facilities and necessary instruments for excavating the decay from the cavity in the tooth, so as to determine the vitality or otherwise of the pulp, it is indeed difficult for him to advise on this matter, and the decision had better be left to the dental surgeon. If there is no exposure of the pulp then every effort should be made to conserve the tooth in question, but a parent is not likely to approach the doctor unless her child has toothache or some swelling of the face. Bad toothache means that the pulp is already infected, and even with careful dressing and filling the pulp may die and an abscess develop. A dead tooth in a child of this age should always be extracted, as it is sure to become a cause of pain or ill-health. Remember to look out for those small localized abscesses or "gumboils," which may burst and leave behind a sinus without the child complaining. The treatment of early decay will save many hours of pain and unhappiness.

#### "Luis," "Louis," "Lewis," or "Ludwig"?

**Q.**—The angle between the manubrium and the gladiolus is sometimes termed the angle of Luis (?), Louis (?), or Lewis (?). Which is the correct spelling, and who was Luis, Louis, or Lewis?

**A.**—The correct spelling is "Louis." Antoine Louis lived from 1723 to 1792. He gave lectures on anatomy in Paris and led the way in the application of medical knowledge to legal problems, taking a hand in various famous cases (Garrison). The German form of the phrase is "Louis'scher Winkel," but the name Louis has sometimes been translated into German as "Ludwig" in this country and elsewhere. Braune stated in 1889 (*Arch. Anat. Entw.*) that he had examined Louis's writings in vain for any reference to this angle, and that the first reference of association with Louis's name occurred in Conrad's book, *Position and Form of Thoracic Organs*, published (in German) at Giessen in 1848. It is probable, however, that the first instance of association would occur not in the author's own writings but in those of someone following shortly afterwards. There was a German anatomist named Ludwig living much earlier (1625-80), but no evidence can be found that his name was ever attached to the angle. The following early works make no reference to Ludwig in this connexion: Cowper (1698), Albinus, *Tables of the Skeleton* (1749), and Cheselden's *Osteographia*. It is probable that Louis's name is correctly associated with the angle.

#### LETTERS, NOTES, ETC.

##### Food-poisoning in S. Devon

**Dr. J. C. CRICKSHANK**, in reference to the answer to the question on food-poisoning in South Devon in the *Journal* of Jan. 1 (p. 30), points out that the service of the Devon County Laboratory, now supported by its association with the E.P.H.L.S., provides for all practitioners in the county full facilities for laboratory and field investigation of such outbreaks as the one described. It appears that all practitioners in the county should have received the full and informative E.P.H.L.S. Memorandum, No. 2, entitled "The Laboratory Diagnosis of Enteric Fever, Dysentery, and Bacterial Food Poisoning."

##### Extra Milk for Patients with Influenza

**Dr. GUY NEELY** writes: During the past few weeks many victims of influenza have needed extra milk. To expect them to rise from their beds—for there is seldom anyone to look after them—still less to travel a mile and a half, wait in a queue at the food office, and take the permit to the food depot is perhaps a little unreasonable even in this bureaucratic age. Why cannot the milk form be given direct to the roundsman, or is this too easy?

##### Post-herpetic Neuralgia

**Dr. E. MILLINGTON (Hove)** writes: The answer given to the question about treatment of post-herpetic neuralgia (Jan. 1, p. 31) makes no mention of any form of radiotherapy or physiotherapy, and paints a gloomy picture generally. In many cases complete relief from this pain may be obtained by x-ray treatment, even with a history of many years, and other cases are helped by electrotherapy and short-wave treatment. X-ray therapy will often alleviate otherwise intractable pain in cases of trigeminal neuralgia, brachial neuritis, and other forms of neuritis, although there is no way of selecting suitable cases beforehand, and some cases will show no response, unfortunately.

##### Wanted—Cade's "Treatment of Malignant Diseases"

The Anglo-Soviet Medical Council has received a special request from the Soviet Union for a copy of Stanford Cade's *Treatment of Malignant Diseases*. Most copies of the book have been destroyed by enemy action. The Council would therefore be grateful if any reader would be willing to sell his copy. Anyone wishing to do this should communicate with Dr. E. Bunbury, Fountain Hospital, London, S.W.17.

##### Corrigenda

**Dr. J. B. DAVEY** wishes to make the following corrections in his letter headed "Colonial Research" printed on Jan. 15 (p. 97): The words "medical work" in line 7 should be preceded by the word "routine"; the name "Ranson" in line 8 should of course read "Manson" (Sir Patrick); and the word "individual" in line 20 should read "individualist."

In line 19 of the first paragraph of the leader on the epidemiology of scarlet fever (Jan. 22, p. 118) the words "over a month" should read "once a month," and in line 14 of the third paragraph the words "these are" should read "there are."

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 5 1944

## SOME PRINCIPLES OF REFORM IN MEDICAL EDUCATION

BY

F. M. R. WALSHE, M.D., D.Sc., F.R.C.P.

The recasting of medical education, having been a topic of recurrent discussion for many years, begins to show signs of becoming a subject of action, and the two reports recently issued by committees of the Royal College of Physicians on social and on psychological medicine lay down lines of reform that seem expedient to some of our number. It is probably reasonable to assume that the two reports are but the heralds of comparable recommendations in respect of other branches of medicine, and there are signs that the specialists will shortly be on the march at the head of thousands of words, determined to bend the medical student to their will.

### The Need for Revision

Few would deny that the methods and content of our present teaching call urgently for revision, but if we were to ask at large, "What are the important defects in the educational diet we provide for the medical student?" we should probably get as many and as diverse answers as there are special aspects of medicine, though we dare not be so sanguine as to anticipate that many of these answers would be the fruit of general ideas on the subject, or that they would dive beneath the surface of the obvious symptoms in search of fundamental faults. We should probably be assured on almost all hands that the student must know more about most of the special branches, and must acquire familiarity with more, and more complex, techniques.

That this is no wild surmise is plainly exemplified in the report on psychological medicine already referred to. This suggests a fully detailed syllabus comprised as follows:

#### *During the Preclinical Years*

12 to 20 lectures on normal psychology.  
Visits to schools, courts, and factories.

#### *During the Clinical Years*

6 introductory lectures on clinical psychology and psychiatry.  
53 further lectures and demonstrations on specified aspects of the subject.  
Seminars and discussion groups covering the whole field.  
Three months' clinical clerking to an in- and out-patient psychiatric department of the hospital.  
A short term of undergraduate residence in a mental hospital, or, alternatively, a clinical clerkship in a mental observation ward.  
A series of domiciliary visits with a psychiatric social worker.  
Finally, a special qualifying examination comprising written, clinical, and oral parts.

The avowed object of this course is "to produce a sound general practitioner and not a specialist in psychological medicine"; but it is admitted that "the proposed syllabus makes demands for a greater share of the time of the medical student."

On the whole, the report on social and preventive medicine is less concerned to formulate an ambitious syllabus, and more interested in a reorientation of some of the teaching in already accepted items of medical training. It is content with a modest allowance of 18 to 20 hours in lectures, and does not demand the 70 or more hours deemed essential by the psychiatrists

for their subject. Yet the report states, "Even so, the curriculum proposed will make further demands on the time of the medical student which can only be met by modification of some other part of the curriculum." It adds later, "The course in preventive and social medicine, as in the clinical subjects, *should become a curriculum.*"

Here we see both reports demanding for their special branches of medicine more time and labour from the medical student, and the casual recognition by one only of them that this is to be made possible by the pruning of "some other part" of the curriculum. To anyone who can read the omens it is clear which way the wind of reform is going to blow. More and more is to be expected of the medical student; no one gives serious thought to assessing the burden he can reasonably be expected to bear, but each branch of medicine vaguely cherishes the fond hope that some other branch will be ready to make the sacrifices essential to the fulfilment of its sectional ambitions, and to the adoption of its private curriculum. Yet if sectional interests are to be given a free hand, and if we concentrate excessively upon partial aspects of medical education, we shall never achieve a rational educational plan, and the student of the future may well find himself crushed beneath an intolerable burden of uncoordinated syllabuses, private curricula, and easy counsels of perfection.

However, it must be said that quite another view of these reports has been expressed (*vide* Lord Moran, *Times*, Nov. 3, 1943), to the effect that they do not propose "to add a new set of facts that the student must try to remember. They are merely intended to foster a habit of mind, a way of looking at things." No one who has studied these reports and done justice to their diverse merits can possibly accept this gloss, for both of them explicitly propose to lay fresh burdens of factual knowledge upon the student—one of them to a quite extravagant extent. Therefore, if the point of view embodied in these proposals prevails, a medical course will become a long and arduous sentence, and one to which few prudent parents will wish to submit their sons or daughters, and which still fewer schoolmasters than at present will care to recommend to their brighter pupils.

It is hard to believe that this is the way of wisdom or of sound reform. It seems to confuse instruction with education, shows little psychological insight into the methods and purposes of education in the true sense, and does not pause to ask the important question of what, in general terms, we wish the finished product of a medical training to be capable. The formulating of a final aim is a necessary preliminary to any scheme of educational reform. Only when we have decided upon this aim can we proceed to draw up the plans necessary to its attainment, having in view the time and the resources available.

If we have in fact reached a wide agreement as to the necessity for change it is because we have been forced to admit defects in the methods and content of our present teaching. Yet we have to bear in mind that as these defects first come to notice they may be but symptoms of more deeply seated disorders inherent in our present methods. If this is so, we shall do no good by patching up and adding to an unsound structure; we must rebuild from the foundations up. To do this we must undertake a thorough and critical analysis of

such defects as have come to notice, for unless we do so we shall find ourselves attempting treatment without adequate diagnosis: a type of enterprise not wholly unfamiliar to us in clinical medicine.

### A Criticism of Achievement and Outlook

A critical survey of the house of medicine to-day shows that it is far indeed from being in order. Not the greatest and most justified enthusiasm for recent advances in knowledge, or for the alleviations of human suffering we have seen in our time, can blind us to the existence of many grave deficiencies in our achievements and outlook. We talk very facetiously about the science and art of medicine, but it may be argued that the "science of medicine" is still a somewhat shadowy conception. From time to time this has been pointed out to us by one or other of those rare philosophers who have found themselves in our ranks, but the thought has been too unwelcome for us to listen to those who remind us. Allbutt, Mereiter, and more recently Crookshank have all drawn attention to the unsatisfactory state of our science and its neglect of a rational use of language. Thus, says Crookshank, "although the Art of Medicine has been greatly advanced, in many respects, during the last century: although the Practitioners of that Art do freely draw upon the vast storehouse of facts called scientific, to the great benefit of suffering humanity: and although all medical men have some acquaintance with certain sciences of which the province is in part continuous with that of the Art of Medicine, there is to-day no longer any Science of Medicine in the formal sense. It is true that observation and thought have led medical men to form generalizations which have obtained acceptance; but there is no longer any organized or systematized *corpus*, or formulated theory, which can be held to constitute the Science of Medicine, and (in a now obsolete terminology) to form an integral part of Natural Philosophy. . . . Her Professors and Doctors decline to define fundamentals or to state first principles, and they refuse to consider, in express terms, the relations between Things, Thoughts, and Words involved in their communications to others."\*

Again, "though we accumulate what we call 'facts' or records of facts without number, in no current textbook is any attempt made to define what is meant by 'a disease.' . . . In a word, no attempt is made to distinguish between what we observe in persons who are ill, on the one hand, and the general notions we form in respect of like illnesses in different persons. . . . in hospital jargon, 'diseases' are 'morbid entities,' and medical students fondly believe that these 'entities' somehow exist in *rebus Naturae* and were discovered by their teachers much as was America by Columbus."

### Precision in Language and Thinking

This fallacy of "misplaced concreteness" infests medical writing and leads even in the most distinguished hands to shocking confusion of thought. Two examples of this are cited in the paper from which the foregoing excerpts are taken—namely, the statement that "lethargic encephalitis is altering its biological properties" and that "a disease is only revealed by the symptoms it produces." Yet the two terms "lethargic encephalitis" and "a disease" are no more than general notions or abstractions, and abstractions have no biological properties and can "produce" nothing. It is a human weakness to hypostatize abstractions—often a pardonable and harmless weakness; but that at the fountain-head of medical thought and teaching we should find this grotesque confusion of thought and language, this failure to distinguish between thoughts, words, and things, is an indictment of the state of our science.

It is surely impossible that we should forge generalizations and propound first principles until we have given precision to our language and thinking. Sir Almroth Wright has recently commented pungently upon the poverty of our terminology; but even the most adequate terminology needs to be used in a framework of rational language if it is not to add to our confusion.

\* *The Importance of a Theory of Signs and a Critique of Language in the Study of Medicine*, by F. G. Crookshank; being Supplement II in *The Meaning of Meaning*, by C. K. Ogden and I. A. Richards. Kegan Paul and Co., 1936.

At this stage in my thesis it is certain that I shall beg to meet with objections. That familiar phenomenon of the successful and euphoric individual who flatters himself that he is a hard-headed and practical man will make his usual and instinctive protest against the use of the intellect by saying that all this talk of language is but a splitting of hairs. Yet even a brief consideration will show that our slovenliness in thinking and in use of language exerts a profound effect upon our teaching. We are teaching clinical medicine merely empirically in terms of "diseases"—save in the case of neurology and cardiology, in which the tendency to think of symptoms and signs in terms of disordered function in normal structures has long been dominant—and not in terms of the range of bodily reactions to a variety of noxae. The student is led to think of illness wholly in terms of largely conventional groupings which are constantly changing, and to believe that "a disease" is a concrete agent that "does things" and produces symptoms. So taught, he is ill equipped to deal with new and unfamiliar reactions or sets of reactions, and cannot handle new and strange experiences as he should. He has to remember a great deal, but may understand very little of the processes and manifestations of illness. No general principles have been imparted to him. Recurrent changes in terminology and methods add to the difficulties of his task. It has to be admitted that as yet we understand very few diseases fully, and even many common manifestations of illness have so far escaped explanation. There is a rapidly growing mass of facts that yet await interpretation and have not yet been brought under adequate generalizations. This is a time in the history of medicine when new facts are being added to our stock faster than we can—or at least than we desire—to sort them out or build them into an ordered fabric of knowledge, and much therefore must remain as necessary matter for memorizing.

Added to the accession of new facts, to the unending flux of opinion and terminology, and to the constant arrival of new methods, is a spate of books and journals—good, bad, and indifferent, all competing for the student's attention—carrying on its surface a flotsam of seductive advertising literature on treatment that influences thought and practice far more than is good for medicine. It is in these trying circumstances that the student has to learn, and the doctor to practise medicine. Of the coherence and more fully reasoned arguments, and of the precise terminology of the ancillary sciences of anatomy and physiology, we see ever less trace in clinical teaching and writing as the mass of unrelated facts and hypotheses accumulates round us.

Nothing is more clear than that we lack both an adequate language—and the rational use thereof—and a body of first principles in medicine, and also the will to provide ourselves with a body of theory based upon these necessities of a science of medicine.

### General Principles of Medicine

The plea is therefore made that some attention shall be given to the theoretical aspect of medicine, and to its formulation and teaching, in any proposed reform of medical education. We who are teachers cannot but confess that too few of us have set ourselves to this urgent task; to synthesizing the information at our disposal, and to the elucidation of fact by clear generalizations. We have been too willing to follow the beaten paths of routine clinical teaching, or, when engaged in research, too eager to add to the bulk of raw information to be willing to pause for thought and to take up the difficult task of developing a general theory of medicine and of eliciting general principles. In short, we have found action—of one kind or another—easier than thought, and it is greatly to be feared that it is in this uninspired frame of mind that we are contemplating a reform of the curriculum.

It is the fundamental defect of our teaching that we have not given the student a firm grasp of general principles, we have not taught him to weigh evidence, to discriminate or to think logically, and we have too often failed to imbue him with that keen desire for understanding that is the essence of true education. We have been content to preoccupy him with feats of memorizing and with the acquisition of an increasing number of techniques.

If, at first sight, it seems unfair to indict the finished products of our teaching with being less than adequately endowed with critical faculty and scientific thought and method, we have only to look round on the medical scene to discover very numerous examples of these basic faults.

They are to be seen in every aspect of medicine and in every category of doctor, both teachers and taught. One disquieting example is the prevalence of unsubstantiated general notions about ill-health. Thus there are still far too many for whom those ill-defined conceptions, "focal sepsis" and "auto-intoxication," provide a sort of "reach-me-down" explanation of almost every variety of chronic illness. Holocausts of teeth and tonsils have been offered up on the altar of this notion, and there can be few maladies—psychological or somatic—which have not been hopefully, if irrationally, treated by these crude procedures, or by the indiscriminating devastation of air sinuses.

Not less indicative of unsound standards of thought is the tendency to assume that in a given case any improvement that follows the administration of a particular remedy must be directly due to its pharmacological action, and a succession of subsequent disappointments to secure benefit often fails to correct the first and hasty impression or to abate our wishful thinking. Although we are all aware of the *post ergo propter* fallacy, it has all too little influence upon our judgments.

The indiscriminate use of almost every newly discovered product of chemical ingenuity is another disturbing feature of modern practice. Few middle-aged women in ill-health can now hope to escape a course of stilboestrol; the sulphonamide drugs are not always used with conspicuous judgment; and our wholesale employment of vitamin preparations might lead the naive observer to suppose that we have found in them a panacea for a wide range of human ills. Doubtless in course of time a sound balance of opinion is reached in respect of all such remedies, but only after much wasteful use and to the accompaniment of fresh uncritical enthusiasms for yet newer remedies. These are matters we dare not continue to tolerate with equanimity.

A striking instance of the ephemeral fashion in theory and practice is provided by psychological medicine in our day. For at least a quarter of a century, and in a literature of unexampled volume, we have been presented with elaborate, and not always harmonious, hypotheses of the psychological genesis and treatment of psychological disorders, major and minor. We have been encouraged to regard the mind as a sort of *chimaera in vacuo bombinans*, and the personality as an entity standing in no relevant relationship to the brain. Yet within the past three or four years we have been seeing an increasingly rapid flight from psychotherapy in favour of the treatment of psychological disorders by physical assaults upon the brain, in the form of chemically and electrically induced convulsions and of mutilations of the frontal lobes. Here we observe, not a scientifically controlled and recorded experimental approach to a new theory and treatment, but a widespread and too often wholly uncritical and inadequately documented employment of drastic procedures the perils and final fruits of which cannot yet be seen. Psychotherapy, meanwhile, still remains the logical corollary to hypotheses of causation that have nowhere been explicitly abandoned; but none of those who, while "on with the new," are not yet "off with the old" seem to have noticed the antinomy inherent in this therapeutic right-about-turn.

It can hardly be maintained that the prevalence in medical thought and practice of what Tristram Sbandy called "hobby-horshical" tendencies, and of the other defects exemplified, can justly be attributed to a mere dearth of information imparted to the doctor during his period of training. They surely arise from those underlying faults that have already been called fundamental, and they cannot possibly be remedied by still further increasing the amount and range of factual knowledge we expect of the student.

#### Training in the Theory of Medicine

We have been too preoccupied with the vocational and technological aspects of training, and too little interested in the theoretical basis of medicine. We have taught medicine too exclusively as a practical art, and, largely unnoticed by us,

medicine has been passing from the stage of simple observation and of empiricism to one in which theory must play an ever larger part. In our hands, it is true, a great deal of medicine has not reached a stage in which broad generalizations are practicable, and much memorizing of facts remains a necessary task for the student. Nevertheless, we might make this easier for him by emphasizing general principles even in the purely vocational side of his training. By this we refer to clinical observation and the methods of diagnosis and treatment, and to the acquisition of a sound basic factual knowledge of disease. Yet this is clearly not the whole of an educational process, and does not by itself give the student sound habits of training, does not teach him how knowledge has been and is being gained, nor impart the ability to recognize sound sources of information and to reject ill-founded speculation and the wishful thinking that plays so large a part in our therapeutic assessments.

If these intellectual aims are to be realized we shall need teachers with a special interest in disease as a whole rather than in individual patients, who will teach on clinical material primarily to display and exemplify general processes of disease. They will have to concentrate upon the making of generalizations and the weaving into a pattern of the many and at present largely unrelated strands that make up the general body of medical knowledge. It becomes increasingly difficult for the independent clinical teacher engaged in private practice to undertake this task as it deserves and requires, and its pursuit may well be the main function of those whole-time academic teachers who are already established in some of our medical schools, and whose numbers will surely have to be increased in future. It would be naive indeed to suppose that a man's capacity for generalization and interpretation can ever depend primarily upon the sources from which he derives his living. Practising physicians who are clinical teachers may in the future, as they have in the past, give us some of our most penetrating generalizations. What is suggested is that we shall choose our professors of medicine from those who have given some indication of their capacity for and interest in general ideas, and that in virtue of their status and freedom from the harassing conditions of private practice they will be free to devote part of their talents undisturbed to the building up of a theory of medicine. This essential task in the building of ordered knowledge will have in future to receive its due share of academic recognition if men are to be encouraged to undertake it; for the transmuting of information into ordered knowledge is a task not less difficult, or less essential, than the acquisition of new facts: a consideration to which in this generation we have been strangely blind, as the present chaos in medical thought sufficiently witnesses.

#### Pruning of the Curriculum

In addition to this rebuilding of the very foundations of medical education, there can be no doubt that an urgent need is a quite ruthless pruning of the range and amount of factual knowledge we expect of the student. These must be cut down. We cannot rationally expect that the newly qualified doctor shall be the complete obstetrician, paediatrician, psychologist, orthopaedist, and expert on hygiene and social medicine.

There will doubtless be a chorus of protest that no one does expect this; yet if we assess the separate opinions of specialists upon what they want for their own branches this is precisely, by implication, what they do seem to expect. A modern full-dress textbook of medicine, surgery, or obstetrics will show how extravagant our expectations already are. These subjects must be stripped to their essentials, and further knowledge upon any one of them acquired after graduation. If new matter is to be introduced into the curriculum, some of the old must go, so that the final reformed scheme asks even less factual knowledge than we now demand; but what we do ask of this kind must be more fully co-ordinated and coherent, and informed by sound general principles. Notions of the critical importance of their own special aspects of medicine that may be urged by enthusiasts must not be allowed to rush us into a new and even worse crowding of the curriculum than we at present see.

For example, in the realm of psychological medicine the content of both normal and clinical psychology is highly charged with controversial matter: conflicting hypotheses

compete for recognition as generalizations of the facts of observation, and these "facts" are not always clearly distinguishable from assumptions. Psychology is in a ferment, and we must not plunge the student into the fermenting-vat. The exponents of this field of medicine must first put it in order and lend it coherence before psychological medicine can hope—or ask—to take its proper place in medical education. This is not to say that the present place taken by it in the curriculum is adequate, but to suggest that a wise infusion of medical education by the principles of psychological medicine demands something more fundamental than the compilation of a long list of titles of lectures and appointments to be crammed into an already overloaded course.

### Essentials of Reform

Similar considerations must determine and limit the requirements of other special branches of medicine. Each must be subordinated to the balance and moderation we wish to see in a new scheme of medical education. In short, the essentials of reform in medical training may be summarized as follows:

(1) A carefully thought out pruning of the amount of factual knowledge we seek to impart, ruthlessly undertaken in order that

(2) the student may be enabled to develop a more thoughtful and critical attitude, and a deeper understanding of the causes and manifestations of disease.

(3) An explicit recognition of the necessity of a leaven of theoretical medicine, side by side with its vocational aspects, and the provision of a category of teachers who shall develop it.

To these ends every branch of medicine must be prepared to make some sacrifices, so that we shall turn out thoughtful and discriminating graduates, capable of handling the unending flow of new experiences that must come to them in the practice of their profession, and capable also of independent judgment. On this sound stock we can always graft a higher order of knowledge in any desired branch of medicine.

The considerations put forward in this article, and thus summarized, will be familiar to all readers of Sir Thomas Lewis's volume of addresses entitled *Research in Medicine*. In these the fundamental principles of medical education, and the qualities and outlook of the teachers of medicine, theoretical and vocational, are discussed more amply and with more authority than I can command. No one who bears any responsibility for the reform of medical education can rightly ignore the principles laid down and expounded in these addresses.

### Conclusion

There are, of course, other aspects of the total problem of medical education not dealt with in this summary expression of a point of view: for example, the type of general education best fitted for the future medical student; the status and categories of teachers we shall need; the better organization of clinical teaching, and the necessity for a drastic reform of our present chaotic and purely vocational examination system. In respect of the last-named, the gross disorganization of the precious last year of the student's clinical training by the haphazardly instalments of the Conjoint Finals would defeat any system of teaching.

In short, the problem is a most complex one, and can be solved only when we have formulated the general principles of a reform of the curriculum and of our methods of teaching. The immediate and urgent issue here raised is the necessity for avoiding another patchwork and compromise revision of medical training and the swamping of the student by the addition to his burdens of fresh requirements from new branches of medicine, or from old branches that have taken new names and adopted new slogans. It would be folly to assume that this danger does not exist. The increasing and inevitable specialization in medicine has called into existence sectional interests nearly all striving for what they regard as adequate recognition for themselves, and it is the growth and momentum of these interests that may well threaten the drawing up of a new and rational plan of medical education.

In 1932, in the columns of this *Journal*, Dr. Charles Wilson, as he then was, wrote an article, entitled "The Student in Irons," in which in clear and admirable terms he laid bare

the defects of the content and methods of our teaching of the medical student. Therein he presented, more lucidly than I can hope to do, the aims that should inspire us in any reform. A brief citation from that paper may be allowed.

"It is nowhere denied that we ask impossible tasks of students, who are bewildered by hours of listening, and that we stamp out the habit of reflection by a ceaseless drill. And this is done in the name of education. . . . So strange an anomaly may set us thinking how we are come to such a pass. The blunt truth would appear to be that the handling and revision of the curriculum are based on a misconception of what we can and ought to attempt in a medical school. The one purpose of the student's years is, it seems, not to train and test habits of thought, but to collect and store a set of facts, as squirrels hoard the nuts on which they hibernate. . . . It may be conceded that such a policy was reasonable when medicine was a slowly progressing science that did not greatly alter in a man's lifetime. To-day it leaves him bankrupt when he has scarcely begun. The little he knows is soon antiquated, and he cannot keep up with a rapidly changing science, for we have so contrived to educate him that he cannot educate himself. . . . We trust neither his industry nor his capacity. He must be driven into different pens for every hour of the day, along with a drifting flock that presses now this way and now that. And this, if I may be allowed to change a metaphor, in the hope that he may one day recognize a disease because he has seen it before."

Surely, this analysis goes far more deeply into the problem than do the two reports we have considered, and shows a recognition of the total requirements of a medical education that is absent from them.

If now we are to content ourselves with a so-called reform that attempts no more than to fit still more into the medical course on the pretext that medicine is enlarging its scope, we shall have betrayed the medical student of the future, and shall have failed to do what is now possible to build a science of medicine with its own body of first principles and its own grammar.

## PETHIDINE AS AN OBSTETRIC ANALGESIC A REPORT ON 150 CASES

BY

BEDELIA GALLEN, M.B., Ch.B., D.P.H.

Resident Obstetric Medical Officer, St. Mary Abbots Hospital,  
London

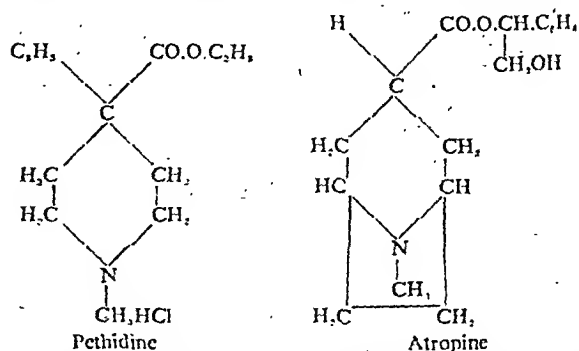
AND

FREDERICK PRESCOTT, M.Sc., Ph.D., M.R.C.S.

Wellcome Research Institution, London

### Pharmacology of Pethidine

Pethidine (also known as dolantin, dolantal, and demerol) is the name given by the General Medical Council to the hydrochloride of the ethyl ester of 1-methyl-4-phenylpiperidine 4-carboxylic acid, which was synthesized in 1939 by Eisleb and Schaumann in a search for atropine derivatives. The chemical relationship of pethidine to atropine is seen in the following formulae:



Unlike morphine it is a relatively simple compound, although on close inspection of the formula some remote chemical similarity can be discerned between pethidine and morphine: thus both possess a piperidine ring.



The early clinical and pharmacological work on pethidine was done on the Continent, although most of the publications since 1940 are inaccessible owing to the war. It is claimed that clinically it is an outstanding analgesic, midway in action between morphine and codeine. Its analgesic action has been studied by Climenko, Homburger, and Barlow (1943), using the Hardy, Wolff, and Goodell (1940) technique, which consists in measuring the pain threshold of the skin to varying intensities of thermal radiation from a lamp. It was shown that 100 mg. by mouth raised the pain threshold by 50% for as long as six hours. By this method Batterman and Himmelsbach (1943) have shown that 50 mg. of pethidine intramuscularly is twice as potent as 22 mg. of codeine, and that 100 mg. parenterally approximates in analgesic potency to 1/16 gr. of morphine.

It is stated that pethidine is unique in possessing a morphine-like analgesic action, as well as being effective as a spasmolytic and sedative. Its pharmacology has been extensively investigated by Duguid and Heathcote (1940), Schumann (1940), Gruber *et al.* (1941), and Barlow (1943). The spasmolytic effect has been attributed to a direct depressant action on smooth muscle resembling that of papaverine, and to an atropine-like action on the parasympathetic nerve endings. It is more effective than papaverine in depressing smooth muscle, but less active than atropine. It relieves visceral pain not only by raising the pain threshold but by relaxing smooth muscle. Intubation studies by Batterman (1943) have demonstrated the spasmolytic effect of pethidine on the human stomach, pylorus, and small and large intestines. Animal experiments have yielded conflicting results, depending on the species used, on the technique employed, and on whether the organ was isolated or *in situ*. The spasmolytic effect of pethidine on the human ureter has been demonstrated by Climenko and Berg (1943).

The sedative effect of pethidine, which is more pronounced when given parenterally, is definite but not as marked as that of morphine. Rovenstein and Batterman (1943), who have used pethidine as a post-operative sedative, consider that the effect of 100 mg. hypodermically is equal to that produced by 1/4 gr. of morphine. After large doses sleep and drowsiness may occur, particularly after parenteral administration, but this is of short duration and less than the period of analgesia, and the patient can be easily aroused (Batterman, 1943). The effect wears off in two hours, although if the drug is given at night or to relieve pain sleep may be prolonged. Unlike morphine, pethidine does not produce a state of amnesia.

**Effect on the Uterus.**—Studies on the effect of pethidine on uterine muscle are conflicting. According to Dreyer (1943) it relaxes the intact and excised uterus; but this is denied by Gruber *et al.* (1941), who claim that in the dog it stimulates the intact and excised organ. This opinion is shared by Yonkman *et al.* (1943). Solomons and Widdess (1943) also state that it stimulates the guinea-pig and rabbit uterus *in vitro*. Using the balloon technique of Chassar Moir, they report that pethidine causes a slight increase in the tone and frequency of contraction of the human uterus *in vivo*. Care must be taken in interpreting clinical results with the balloon technique, as the introduction of a foreign body such as a balloon into the uterine cavity may produce reflex contractions. Woodbury (1943), using this technique, found that pethidine had no effect on uterine contractions in the human pregnant uterus. The effect of any drug on the uterus, animal or human, depends on the blood supply and stage of proliferation of the organ, which in turn depend on the oestrogen and progesterone tide. Thorp (personal communication) states that pethidine enhances the contraction of the rabbit uterus treated with pituitary extract in the oestrogenic phase, but relaxes it after contraction with adrenaline; in the progesterone phase pethidine has no effect. According to Thorp pethidine has no effect on the muscle tone of the uterus of the pregnant cat. In the following study it was evident that pethidine exerted a definite antispasmodic action on the cervix during labour.

#### Clinical Studies in Labour

The study was made because the unique properties of pethidine that have been reported—its combined analgesic, antispasmodic, and sedative actions—suggested that it might be a

very useful drug for producing obstetric analgesia. Also the fact that it is less of a respiratory depressant than morphine (Batterman, 1943) should render it safer for the baby than the latter, the dangers of which are well known. The reported absence of mental depression, urinary retention, and constipation following the administration of pethidine (Batterman, 1943) also appears to be a definite advantage, as these symptoms are commonly produced by morphine. Lastly, the relatively high margin of safety compared with morphine permits repeated dosage. The possible future shortage of morphine also makes the clinical evaluation of the newer analgesics imperative.

Since this study was begun two publications on pethidine as an obstetric analgesic have appeared in America, where the drug is known as demerol. Gilbert and Dixon (1943) report that in doses of 100 mg. to 400 mg. it noticeably shortens the time of labour in primiparae. The average dose was 300 mg. Adequate analgesia without amnesia was obtained by 72% of the patients; in combination with a barbiturate satisfactory amnesia was experienced by 61%. No adverse effects were observed on mother or baby. Roby and Schumann (1943) gave pethidine intramuscularly in doses of 100 mg. in combination with scopolamine to women in labour as soon as pains began. Satisfactory amnesia was produced in 85% of the cases; 14% of the babies needed some form of resuscitation.

#### Selection of Patients; Administration; Dosage

**Clinical Material.**—The series treated with pethidine reported here consisted of 150 cases. Detailed records were kept on the first 100 cases only. Of these, 53% were placid and not apprehensive; 47% were nervous and apprehensive. One of the latter group had a spastic cervix which dilated satisfactorily under the influence of pethidine, but required forceps delivery. Another had a rigid cervix, which failed to dilate and necessitated lower-segment Caesarean section. The 100 cases recorded comprised 70 primigravidae and 30 multigravidae, and all were apparently normal on medical and obstetric examination.

**Method of Administration.**—Oral administration, which was tried at first, was found to be unsatisfactory on account of the frequency of vomiting and the slowness of action. Roby and Schumann also found the oral route unsatisfactory. It was observed that it took from 20 to 60 minutes for the maximum analgesic effect to be produced by mouth. Pethidine was therefore given either intramuscularly or intravenously, or by the combined routes. Of the 70 primigravidae, 33 received the drug solely by intramuscular injection, while 37 were given both an intramuscular and an intravenous injection. Of the 30 multigravidae, 20 were given the drug intramuscularly, and 10 received it intravenously with or without an accompanying intramuscular dose.

**Dosage and Times of Administration.**—Two dosage schemes were tried:

(a) A total dose of 200 mg. of pethidine was given intramuscularly either alone or in combination with the stock mixture used in the labour ward (see Table I) or else with scopolamine gr. 1/150. The pethidine was given in two doses of 100 mg., one an hour after the other. The second injection was given either alone or with the stock mixture or scopolamine. In cases in which the first stage of labour was prolonged for more than 8 to 10 hours after the first injection of pethidine further injections were given, up to a total of 400 mg. in 24 hours. Gilbert and Dixon (1943) gave up to a maximum of 650 mg. in the same period. It was exceptional in our series to give more than 200 mg. The average time taken for the production of analgesia after intramuscular administration was 15 minutes, and the duration of action 3 to 4 hours.

(b) In order to obtain a more rapid effect some cases received pethidine intravenously. A dose of 100 mg. was given initially. This acted in 5 to 10 minutes. An hour later another 100 mg. was given intramuscularly, either alone or in combination with scopolamine gr. 1/150. The duration of action was 3 to 4 hours. If the first stage of labour was prolonged for more than 8 to 10 hours after the initial dose further injections of 100 mg. were given intramuscularly up to a total of 400 mg. in 24 hours.

Vomiting and other unpleasant side-effects may occur if pethidine is given rapidly by the intravenous route. This was minimized by asking the patient to close her eyes and by taking five to ten minutes over the injection. Ideally, the first injection of pethidine is best given when the cervix is

two fingers dilated and the patient is having regular contractions. Although pethidine does not depress respiration to such an extent as morphine, it would appear that it is not wise to give it within 2½ hours of the expected delivery of the child. This figure compares favourably with that of four hours for morphine. Many of the patients receiving pethidine actually slept during labour.

#### Evaluation of Analgesic Effect

The degree of analgesia produced in the first 100 cases compared with controls receiving the stock mixture used in the labour ward (chloral hydrate gr. 30, potassium bromide gr. 30, tinct. opii m. 10) was as follows:

Degree of Analgesia	Pethidine Cases	Control Cases
Complete	10	0
Satisfactory	50	10
Fair	34	90
Nil	5	0
Amnesia	1	0
	100	100

These figures refer to the first stage of labour only, as in most cases Minnitt's gas-and-oxygen apparatus was used to complete the second stage of labour.

In only one case in this series—a young primigravida—was amnesia produced. Initially she was given morphine gr. 1/6 and scopolamine gr. 1/150, followed by 100 mg. of pethidine intramuscularly, which was repeated twice, and a further dose of scopolamine gr. 1/150. Intermittent chloroform anaesthesia was administered at the end of the second stage. It is of interest to record that the duration of labour from the time of administration of the morphine-scopolamine was 5½ hours. Roby and Schumann (1943) obtained satisfactory amnesia in 85% of their cases. A dose of 100 mg. of pethidine was given intramuscularly, followed by scopolamine 1/100 gr. A further injection of scopolamine gr. 1/200 was given an hour later, and in the case of primiparae repeated every one to five hours.

#### Effect on Duration of Labour

Table I gives the average duration of labour, in hours, of the various groups, the interval between the initial dose of pethidine and the birth of the child, the interval between the final dose of pethidine and the birth of the child, and the average duration of the third stage in minutes.

TABLE I

Medication	Parturient	No. of Patients	Route		Average Duration of Labour (hours)	Average Time between Initial Dose and Birth (hours)	Average Time between Final Dose and Birth (hours)	Average Duration of Third Stage (min.)
			i.m.	i.v.				
Pethidine with or without stock mixture*	P	59	26	33	20-70	7-21	5-34	20
Pethidine and scopolamine	M	23	15	8	16-47	5-09	3-18	20
Patients receiving stock mixture only	M	11	7	4	15-95	9-66	6-76	14-5
	M	7	5	2	16-89	5-90	5-30	15-5
	M	70			18-81			18-9
	M	30			10-74			17-8

\* The stock mixture contained chloral hydrate gr. 30, pot. bromide gr. 30, tinct. opii m. 10, aq. chloroformi ad 1 oz.  
† P—Primiparae, M—Multiparae.

On examining this table it would appear that labour was prolonged in those patients receiving pethidine, in comparison with controls not receiving the drug. This apparent prolongation of labour was in our opinion due to the high proportion (47%) of apprehensive and nervous women in the selected cases. The actual duration of labour, however, from the time of administration of the pethidine in both primigravidae and multiparae falls well within, if not below, average time limits. Gilbert and Dixon (1943) report that in their series pethidine noticeably shortened the duration of labour in primiparae, and Roby and Schumann (1943) state that the drug does not prolong labour.

#### Instrumental Delivery

The use of pethidine did not appear to increase the incidence of instrumental delivery. In this series forceps were used in 10% of all cases, but there was always a good obstetric reason

for this. In only one case was there weakening of uterine contractions necessitating the application of forceps. The incidence of instrumental delivery in the control group receiving pethidine was 13%. The reasons for the use of forceps in the two groups were as follows:

Reason for Forceps	Pethidine Cases	Control Cases
Contracted outlet	5	2
Deep transverse arrest	1	4
Extreme nervousness and rigid perineum	1	0
Extreme nervousness and lack of co-operation	2	2
Weak uterine contractions and rigid perineum	1	1
Maternal distress	0	2
Foetal distress	0	1
Threatened uterine inertia	0	1
	10	13

#### Obstetric Complications

The use of pethidine did not increase the incidence of obstetric complications, of which there were three. Two were cases of retained placenta and one a rigid cervix. In one instrumental delivery the placenta was retained, but was successfully expressed by Credé's method. In no other case in the series was there any weakening of the contractions, and hence there has been no tendency to post-partum haemorrhage. On the contrary, it was observed that in a case in which pethidine had been used placenta and membranes were much more liable to come away complete from the uterus. In the second case of retained placenta the latter was adherent to the uterus, necessitating manual removal, but in this instance there was a history of a retained placenta in a previous delivery. In the case of the rigid cervix, in spite of a labour prolonged for 48 hours, and the use of morphine, scopolamine, and pethidine, the cervix failed to dilate, and lower-segment Caesarean section had to be performed in the interest of mother and child.

It would appear that pethidine exerts a definite antispasmodic effect on the cervix, particularly in the clinical entity spasmodic cervix, in the treatment of which it is superior to morphine.

In the control group obstetric complications occurred in 2%. Both were cases of post-partum haemorrhage from a relaxed uterus due to weak contractions.

#### Reactions in the Mother

The commonest toxic manifestation in the mother was vomiting, which occurred in 28% of the cases. As previously stated, oral administration was discontinued because of vomiting and delayed action. It was also observed that a transitory rise in blood pressure of some 10 to 20 mm. systolic and/or diastolic was fairly common within 15 minutes of administration. This rise of blood pressure did not last for more than 30 to 60 minutes. No association between vomiting and rise of blood pressure was established. On account of the possible rise in blood pressure pethidine was not given to cases complicated by toxæmia or hypertension. Other untoward symptoms often observed, particularly after intravenous injection, were dizziness, tingling of the limbs, vertigo, and dryness of the throat. In no case was excitement observed. The frequency of vomiting following intravenous injection was effectively reduced by injecting the pethidine very slowly over a period of five to ten minutes, while requesting the patient to keep her eyes closed.

#### Condition of Babies

Of the 100 babies born to mothers receiving pethidine 91 were apparently normal and active at birth, and 9 were slow—i.e., required resuscitation measures. These figures are similar to those of Roby and Schumann (1943). There were two deaths, due respectively to a tentorial tear and a prolapsed cord. The neonatal morbidity for the first three days after birth was nil. Seven of the babies were cyanosed and 7 suffered from respiratory depression. Slight impairment of pulsation was noted in 9 babies and poor muscle tone in 8. In no case did any of the babies fail to respond to routine methods of resuscitation for the newborn, crying well within at most 20 to 30 minutes of birth and responding to stimulation.\*

\* In the control group given the chloral-bromide-opium mixture there were 2 slow babies. One was limp, but responded quickly to treatment. The other was blue, and went into white asphyxia; it recovered with treatment.

In respect of the 9 slow babies Table II shows the dose of pethidine and the time between its administration and the birth of the child.

TABLE II

Parity	Degree of Dilatation of Cervix on Initial Dose	Initial Dose	Time of Initial Dose before Birth	Final Dose	Time of Final Dose before Birth
1	4 fingers	100 mg. i.m.	2 hrs. 10 min.	100 mg. i.m.	30 min.
1	3 "	100 mg. i.m.	55 min.	—	—
1	3 "	100 mg. i.m.	2 hrs. 25 min.	100 mg. i.m.	20 min.
0	Anterior lip	100 mg. i.v.	20 min.	—	—
0	3 fingers	100 mg. i.v.	2 hrs.	—	—
0	3 "	100 mg. i.v.	2 hrs. 15 min.	100 mg. i.m.	1 hr. 5 min.
0	3 "	100 mg. i.v.	2 hrs. 35 min.	100 mg. i.m.	1 hr. 10 min.
0	3 "	100 mg. i.v.	2 hrs. 25 min.	100 mg. i.m.	1 hr. 25 min.
0	4 "	100 mg. i.m.	3 hrs. 15 min.	100 mg. i.m.	1 hr. 15 min.
0	—	scopolamine gr. 1/150	—	scopolamine gr. 1/150	—

In all these cases the progress of labour was much quicker than was anticipated clinically. From experience with them it was decided that it is undesirable to administer pethidine within 22 hours of the expected delivery of the child. The average time between the final dose and the end of labour in Gilbert and Dixon's cases was 2 hours 22 minutes in primiparae.

#### Summary

In the dosage employed pethidine is an effective obstetric analgesic. It does not, however, produce amnesia unless given with adequate doses of other drugs—e.g., scopolamine and barbiturates.

Only 5% of the patients failed to obtain any relief from pethidine. Analgesia was complete or satisfactory in 60%.

Two dosage schemes were found to give satisfactory results: a) Initial dose 100 mg. intramuscularly, repeated one hour later with a chloral-bromide-opium mixture or with scopolamine; b) 100 mg. pethidine intravenously, followed by 100 mg. intramuscularly an hour later, either alone or with scopolamine gr. 1/150. In either technique further intramuscular injections of 100 mg. can be given up to a total of 400 mg. in 24 hours. The first injection is best given when the cervix is two fingers dilated and the patient is having regular contractions.

Pethidine and scopolamine form an effective combination for producing obstetric analgesia.

Given intravenously pethidine produces analgesia in 5 to 10 minutes; intramuscularly in 15 minutes. The duration of action is 2 to 4 hours. Intravenous administration produces a more rapid and powerful initial action, but intramuscular administration is highly satisfactory and equally effective. Intravenous administration is contraindicated in labour complicated by toxæmia or hypertension. Pethidine has a definite antispasmodic action on the cervix.

Statistically, in comparison with controls pethidine appeared to prolong labour. This was probably due to the selection of the cases. The figures compare well with average figures for the duration of labour.

No increase in the incidence of instrumental delivery or obstetric complications was associated with the use of pethidine.

Reactions in the mother included vomiting, a temporary rise of blood pressure, dizziness, tingling of the limbs, and dryness of the throat. These were transient, and, although unpleasant, gave no cause for alarm.

Of the babies 91% were apparently normal and active at birth; 9% were slow, and required resuscitation.

There were no deaths among the babies that could be attributed to pethidine. The neonatal (three days) morbidity was nil.

This investigation was carried out in the obstetric unit of St. Mary's (L.C.C.) Hospital, Kensington, from Jan., 1943, onwards. Thanks are due to the consultant obstetrician, Mr. W. C. W. Nixon, for his helpful criticism of the investigation and the manuscript.

#### REFERENCES

- Barlow, O. W. (1943). To be published. Quoted by Batterman, loc. cit.  
 Batterman, R. C. (1943). *Arch. intern. Med.*, 71, 345.  
 — and Himmelsbach, C. K. (1943). *J. Amer. med. Ass.*, 122, 222.  
 Linenko, D. R., and Berg, H. (1943). *J. Urol.*, 49, 253.  
 —, Homburg, E., and Barlow, O. W. (1943). To be published. Quoted by Batterman, loc. cit.  
 Meyer, N. (1943). Quoted by Batterman and Himmelsbach, loc. cit.  
 Duguid, A. M. E., and Heathcote, R. St. A. (1940). *Quart. J. Pharm. and Pharmacol.*, 13, 318.  
 Eisleb, O., and Schaumann, O. (1939). *Disch. med. Wochschr.*, 65, 967.  
 Gilbert, G., and Dixon, A. B. (1943). *Amer. J. Obstet. Gynec.*, 45, 320.  
 Gruber, C. M., Hart, E. R., and Gruber, C. M., jun. (1941). *J. Pharmacol.*, 73, 319.  
 Hardy, J. D., Wolff, H. G., and Goodell, H. (1940). *J. clin. Invest.*, 19, 649.  
 Luby, C., and Schumann, W. R. (1943). *Amer. J. Obstet. Gynec.*, 45, 318.  
 Lowenstein, E. A., and Batterman, R. C. (1943). *Arrestology*, 4, 126.  
 Schaumann, O. (1940). *Arch. exp. Path. Pharmacol.*, 196, 109.  
 Olomons, E., and Widdess, J. D. H. (1943). *Lancet*, 1, 617; *Irish J. med. Sci.*, 295, 637.  
 Woodbury (1943). Quoted by Batterman and Himmelsbach, loc. cit.  
 Monkman, F. E., et al. (1943). *Proc. cent. Soc. clin. Res.*, 15, 89.

## OBSTETRIC ANALGESIA WITH PETHIDINE

BY

WALTER SPITZER, M.D. Prague, M.R.C.S., L.R.C.P.  
 Senior Resident Obstetrician, Kingston County Hospital, Surrey

Pethidine hydrochloride has been studied in our maternity department since Oct., 1941, in regard to its analgesic and spasmolytic effects on normal labour. It is a pain reliever of fairly recent introduction, the hydrochloride of the ethyl ester of 1-methyl-4-phenylpiperidine-4-carboxylic acid, discovered by Eisleb and Schaumann in their search for an ideal analgesic with spasmolytic atropine-like properties. The drug is known on the Continent as "dolantin" and in the United States as "demerol," and was officially named pethidine by the G.M.C. a year ago.

The pharmacological virtues and faults of pethidine have been carefully surveyed by Rothschild (1941) of Basle. It possesses a powerful analgesic action like that of morphine, but is stimulating rather than depressing to the central nervous system. Because of its depressant effect on smooth muscle tissue its spasmolytic properties have been compared to those of atropine and papaverine. Several authors have claimed that it can antagonize the effects of acetylcholine and histamine on the intestine (Eisleb and Schaumann, 1939; Duguid and Heathcote, 1940; Schaumann, 1940). Gruber *et al.* (1941) could not acknowledge the spasmolytic action. It is relatively non-toxic, and has little effect on the pulse rate or the pupil. It lowers the blood pressure and depresses the respiration only in large doses.

Only a few clinical reports on pethidine are available in this country. Prof. Christie (1943) undertook an investigation on behalf of the War Wounds Committee of the Medical Research Council. Pethidine proved to be of value as an analgesic when given by the mouth to 335 patients of six different hospitals. Of the patients with "severe pain" 55% obtained complete relief and 20% partial relief; of those with "moderate pain" 61% were completely and 12% partially relieved. Toxic symptoms were uncommon and never serious. Fitzgerald and McArdle (1943) described the usefulness of pethidine in neurological cases.

The Continental literature on pethidine in a variety of conditions is very encouraging; and as regards obstetrics, Benthin (1940, 1942), Fuchs (1941), and Sonnek (1941) have described excellent results in the relief of pain in labour. Detailed literature is not accessible in this country.

It seemed to me to be advisable to investigate another method of inducing analgesia in the first stage of labour which would cover three important points—namely, (1) reduce pain without having a depressing effect on the respiration and circulation of mother or baby; (2) avoid psychic depression; (3) avoid prolongation of labour. The choice of obstetric analgesics in any particular case has often to be made according to existing conditions. That is why an ideal method has not yet been agreed upon and legions of analgesic and anaesthetic substances in a variety of methods of administration are used all over the world. The exhaustive studies of obstetricians in this country have shown that "twilight sleep" is, for the baby, a dangerous first-stage treatment. All general anaesthetics weaken uterine contractions and retraction. The barbiturates depress the prothrombin levels in mother and child by causing damage to the liver, in which prothrombin is formed (Browne, 1942; Fitzgerald and Webster, 1942). Barbiturates are sometimes responsible for delay, with deleterious effects on the third stage of labour.

In domestic practice chloral hydrate and bromide and/or morphine are still most commonly used. While the first two drugs are safe and fairly satisfactory, the use of morphine for analgesia is unsafe for both mother and baby. It is encouraging that Eardley Holland (1943) has reminded the profession again of the dangerous effects of morphine as regards the respiration of the foetus. Especially in the present era, in which there is an increase in the number of premature labours, the liability to primary apnoea and atelectasis or pneumonia after use of morphine or the popular derivatives has to be taken into account. In short, all narcotics depress the respiratory centre of the foetus far more than that of the mother, and occasionally

from hopeless malignant disease. The cannula shown in the accompanying illustrations can be regarded as fool-proof provided the simple technical details given below are followed.

### Technique

The patient lies prone. A wheal of local anaesthetic is raised on the skin in the middle line just above the manubrio-gladiolar junction. Using a large but short hollow needle, the point is driven right on to the bone and about 2 c.cm. of 1% solution of novocain is infiltrated. This subperiosteal infiltration is an important detail. The area is then massaged with a swab so as to disperse the anaesthetic and enable one to feel the manubrio-gladiolar synchondrosis. The trocar and

the tip of the cannula into the marrow cavity is undeniable more citrate is injected and the syringe is disconnected. Quickly the cannula is linked with the infusion or transfusion unit, the tubing of which has been previously demonstrated to be free from air-bubbles. Strips of adhesive plaster of appropriate width are used to fix the wings to the chest wall and narrow strips of the same material are placed to steady the attached tubing at the correct angle (Fig. 4).

Spectators unfamiliar with the method invariably remark (a) how painless is the procedure; (b) how easily fluids gravitate into the medulla—they liken the rate of gravitation (before it has been damped down) to that expected after entry of a large unobstructed vein.

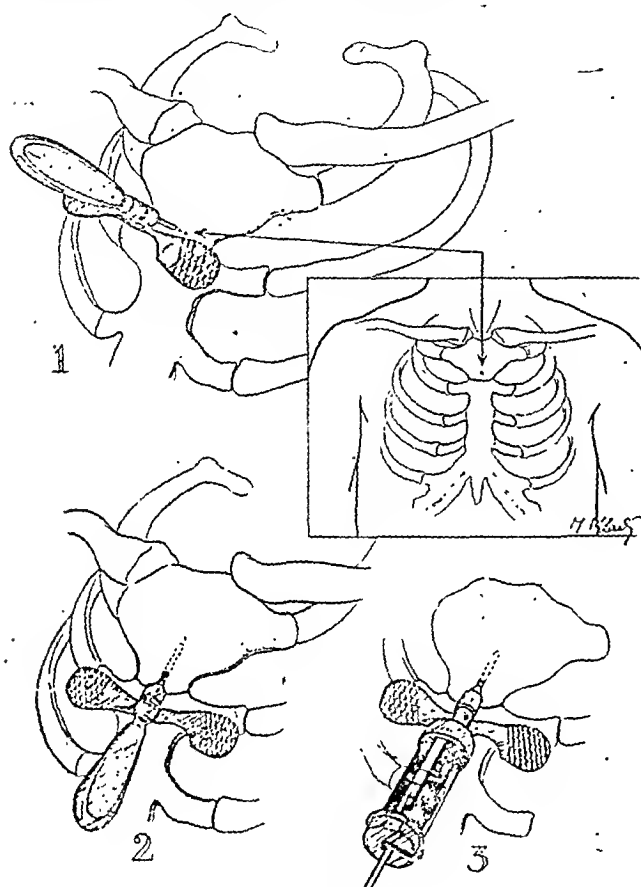


FIG. 1.—The trocar and cannula about to enter the manubrium.  
FIG. 2.—The medullary cavity entered.

FIG. 3.—Having injected a small amount of citrate solution, the piston is withdrawn, and if red marrow is easily and liberally aspirated the extremity of the cannula is correctly placed within the marrow cavity. This step is fundamental.

cannula is inserted just above this ridge (Fig. 1) and pointed almost directly downwards towards the floor, but with a very slight inclination towards the patient's head. An unhurried boring motion is imparted to the instrument. The pressure, at first slight, is increased. The feeling that the outer plate has been penetrated is unmistakable. Penetration being accomplished, the angle of the instrument is altered and the point is directed towards the patient's head. The wings do the rest—they ensure that the correct depth has been reached, they set the correct angle, and they prevent too deep penetration (Fig. 2). The trocar is removed. The next step is to take a 10- to 20-c.cm. Record syringe half full of sodium citrate solution, which is in readiness. The syringe is affixed to the cannula and some of the citrate solution is injected. The piston is withdrawn. If what appears to be blood (it is red marrow) is easily and liberally withdrawn so that it colours the whole of the contents of the syringe (Fig. 3) the extremity of the cannula is correctly placed within the marrow cavity. If the flow of marrow is not entirely free, the trocar is reinserted into the cannula, which is then very slightly withdrawn and another attempt to aspirate marrow is made. When entry of

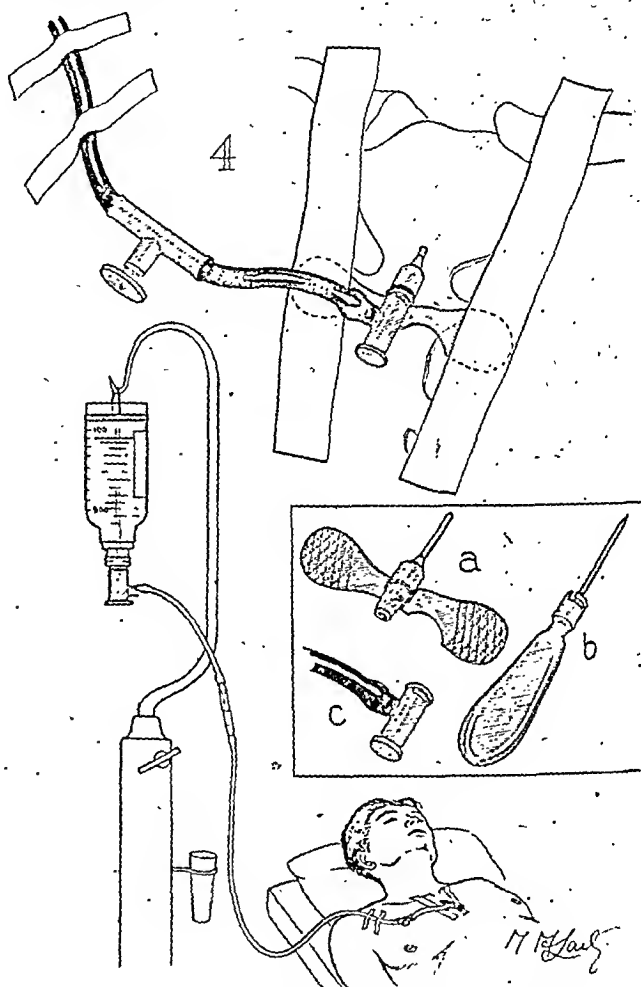


FIG. 4.—The cannula is linked to the infusion apparatus.

For want of ocular demonstration, generations of surgeons have suspected that too often broken bones are filled not with red marrow but with black ingratitude. It may well be that the rising generation will verify almost daily that even in old age the normal sternum is full of marrow so red and so fluid that on macroscopic acquaintance it is indistinguishable from freshly drawn blood.

Mr. P. Regen of Messrs. Willen Bros. not only has carried out the making of the trocar and cannula, but by his enthusiasm and knowledge has been largely responsible for the present state of its development. Several features of the instrument, notably the large-handled trocar, were devised by Mr. T. W. Pearce, biochemist at the Dryburn Hospital, Durham. My former house-surgeon, Mr. L. D. Miller, is still investigating, on the living and in the post-mortem room, the depth of the marrow compartment from the skin overlying the sternum. As a result of these investigations it is possible that the instrument may be improved still further.

Major F. M. Burton, M.D., F.A.C.S., U.S. Army Medical Service, has helped me with gravity blood transfusions by this route.

### REFERENCES

- Bailey, Hamilton, and Carnow, J. M. (1934). *British Medical Journal*, 1, 11.  
Tocantins, L. M., and O'Neill, J. F. (1941). *Surg. Gynec. Obstet.*, 73, 281.

## STAPHYLOCOCCAL SEPTICAEMIA TREATED WITH SULPHADIAZINE

BY

H. BATHURST NORMAN, G.M., D.M., M.R.C.P.

*Major, R.A.M.C.; Medical Specialist*

The chemotherapy of staphylococcal septicaemia by means of drugs of the sulphonamide group has been disappointing. In a study of the efficacy of the newer derivatives of this group Kolmer and Brown (1942) conclude that the chemotherapy of staphylococcal infections is unsatisfactory and is certainly inferior to similar therapy applied to haemolytic streptococcal and pneumococcal infections. Reimann (1942), after an exhaustive review of published cases, is of the same opinion. The treatment of choice for these infections is by means of penicillin. Unfortunately penicillin is not yet available for general use, and until supplies are forthcoming the sulphonamides remain the most hopeful therapeutic agents.

In the case here recorded sulphadiazine showed itself to be remarkably efficacious. Finland, Peterson, and Goodwin (1942), who have compared the efficacy of various preparations of sulphonamides, treated five cases of staphylococcal septicaemia with sulphadiazine. The average total dose given was 147 g. They claim a good therapeutic response in one case and a doubtful response or good initial response with relapse in the other four. It should be noted that, of these four, one was complicated by pyonephrosis and three by osteomyelitis. There were no deaths, but the cases complicated by bone involvement needed surgical drainage before chemotherapy was effective. These authors conclude that the efficacy of sulphadiazine is probably similar to that of sulphathiazole, but its lower toxicity makes it the drug of choice, particularly when prolonged therapy is desirable. In the present case sulphadiazine was not used until sulphathiazole had proved to be ineffective.

### Case History

The patient, a soldier 32 years of age, was admitted to a military hospital on Feb. 23, 1943, complaining of aching in the limbs and malaise for one week. His health previously had been good, but a fortnight before the onset of his illness he had had a boil on the back of his neck which had been treated with hot fomentations and vigorous expression of pus. During several days before admission he had felt unwell and feverish, and was thought to have an influenza attack. There had been some cough with blood-stained sputum, and heavy night sweats had been troublesome. The bowels had been constipated. He complained also of a tender lump over the left scapular angle that was painful when he sat back against his pillows. There had been no known contact with any infectious disease.

On examination the temperature was 101° F. and pulse rate 115. There was no evident anaemia, but the lips had a cyanotic tinge. The throat and teeth were in good order. The lungs showed no obvious abnormality. The cardiovascular system was normal and the blood pressure 130/95. The spleen could not be felt. No abnormality was found in the central nervous system. There were tender nodules at the angle of the left scapula, in the right lumbar region, in the groins, on the abdominal wall, in the right thigh, and on the inner aspect of the left knee. Some of these were acutely tender, and over several the skin was reddened. The urine was acid in reaction, with no sugar or albumin, and the deposit contained a few leucocytes and epithelial cells. The blood count on admission was: haemoglobin, 84%; red blood cells, 4,690,000 per c.mm.; colour index, 0.91; white blood cells, 14,000. The sputum contained no tubercle bacilli, but was blood-stained.

The patient was put on full doses of sulphathiazole. On March 2 a fresh crop of nodules appeared, a hectic temperature persisted, and his general condition was very poor. A differential white cell count gave a total of 20,700, with 78% polymorphonuclear cells. Blood culture proved sterile, but pus from a fluctuant nodule on the left arm was reported on as follows: "Smears: Large numbers of pus cells and clusters of Gram-positive cocci, morphologically staphylococci. Culture: Profuse growth of *Staph. aureus*." X-ray examination of the chest showed a "right basal pneumonitis."

By March 9 the patient's condition had still further deteriorated. There was no abatement in the fever and he had developed an ulcer on the right cornea. Several of the abscesses were fluctuant, and from two of them a small amount of thick pus was aspirated. A few petechial spots were noted on the trunk. A large, deep, and very tender abscess developed in the muscles of the right thigh, and

there was acute pain with local tenderness in the region of the left elbow; but radiographs of the joint and of the right femur were negative. The white blood cell count was 16,600.

On the following day a shower of emboli occurred over the lower extremities, giving the picture of an extensive macular rash. The temperature was at this time 103.5° F. and the pulse rate 145. On March 13 sulphathiazole was stopped, a course of 60 g. having been completed without obvious benefit. The administration of sulphadiazine was then begun. After 48 hours the temperature was normal, and the patient's comment was: "I feel quite different. I did not expect to feel as I do now in six months' time." A blood count showed: haemoglobin, 82%; red blood cells, 4,690,000 per c.mm.; colour index, 0.9; white blood cells, 22,000, 77% being polymorphonuclears.

The temperature did not settle altogether, and a slight evening rise persisted, but the general improvement in well-being was maintained and there were no further embolic phenomena. The white cell count on March 17 was 11,600, and on March 25 14,200. At this time sulphadiazine was stopped after a total dosage of 100 g. The patient's general condition was now fairly satisfactory. Pathological examination of the urine had been repeatedly negative. The haemoglobin was 82%, and the leucocyte count on April 1 was 13,600. A large indurated swelling of the right thigh was still present, causing much pain and discomfort. A further radiograph of the right femur was negative. By April 13 this swelling had become more localized, with a suggestion of central fluctuation. The haemoglobin and white cell count were unaltered. There was no further rise of temperature. On April 20, in view of the prolonged septic infection and moderate degree of anaemia, one pint of fresh compatible blood was given by intravenous transfusion. Haemoglobin was 96% after transfusion. On May 4 the abscess in the right thigh was aspirated, 3 c.cm. of blood-stained serous fluid being withdrawn; this was sterile on culture. Convalescence thereafter was uneventful.

### Summary

A case of staphylococcal septicaemia is recorded in which a dramatic response was obtained with sulphadiazine after sulphathiazole had proved ineffective. Since penicillin, the drug of choice, is not generally available, optimum use must be made of the sulphonamides in treating this condition. Sulphadiazine is the preferable derivative of this group because of its low toxicity and its apparent greater efficacy.

My thanks are due to Col. A. D. Stirling for permission to publish this case.

### REFERENCES

- Finland, M., Peterson, O. L., and Goodwin, R. A. (1942). *Ann. intern. Med.* 17, 920.  
Kolmer, J. A., and Brown, H. (1942). *Arch. intern. Med.*, 69, 636.  
Reimann, H. A. (1942). *Ibid.*, 70, 134.

## SPONTANEOUS RUPTURE OF ABNORMALLY MOBILE SPLEEN

BY

JAL DUBASH, M.D., D.C.P., D.T.M.&amp;H.

*Pathologist, E.M.S. Area Laboratory, Borough General Hospital, Ipswich*

AND

G. F. LANGLEY, Ch.M., F.R.C.S.

*Hon. Assistant Surgeon, East Suffolk and Ipswich Hospital*

Spontaneous rupture of the spleen in non-tropical countries is a very rare condition, and is known to occur occasionally in patients suffering from malaria or typhoid; a few cases of rupture of leukaemic spleens have been recorded. Zuckerman and Jacobi (1937) reviewed 28 cases of rupture of the normal spleen, but considered that only 21 of these could be accepted. In the case now reported a spontaneous rupture of the spleen occurred while the patient was in bed in hospital suffering from acute axillary lymphadenitis; subsequent examination showed only inflammatory changes in the spleen.

### Case Report

A soldier aged 35 was admitted to the Borough General Hospital, Ipswich, on Sept. 13, 1942, suffering from pain in the left axilla of 24 hours' duration. On the evening before his admission he complained of aches and pains all over the body and had vomited once. On admission the temperature was 101.6° F., pulse rate 95, and respiration rate 22. A few enlarged tender glands were felt in the left axilla; but no primary cause for this adenitis was found. He had been given 7 g. of sulphapyridine during the previous



day in a camp reception station. After admission he was given sulphathiazole by mouth and local treatment by short-wave therapy.

On Sept. 15 the patient suddenly collapsed. It was apparent that a severe intraperitoneal haemorrhage had occurred; a blood count was carried out and blood transfusion was given. The count showed: red cells, 3,800,000 per c.mm.; Hb, 60% (Sahli—standard 100% = 15.5 g.); white cells, 36,370 per c.mm.: myelocytes 3,700, metamyelocytes 6,600, neutrophil polymorphs 22,000, lymphocytes 2,590, eosinophils 370, mononuclears 1,110 per c.mm. There were no nucleated red cells: this was taken to be a response to severe haemorrhage. A pre-operative diagnosis was made of rupture of the spleen or of an intraperitoneal aneurysm, probably of the splenic artery.

At operation the peritoneal cavity was full of blood, five and a quarter pints being measured. The spleen was ruptured transversely at its convex border. Splenectomy was easily performed, as there were no adhesions and the splenic pedicle was unusually long. The patient collapsed during closure of the abdomen and died in spite of the usual resuscitation methods.

**Post-mortem Findings.**—The stomach contained a fair quantity of undigested food and some bright blood. The mucosa showed minute erosions, but no chronic ulceration. The sternal bone marrow was greyish red and hyperplastic. No other pathological lesions were found.

**Histological Examinations.**—Spleen:—No definite pathological change was noted in the sections, apart from evidence of acute inflammation. Sections were sent to Dr. A. H. T. Robb-Smith for his opinion. His report is as follows: "The spleen has the appearances, apart from actual trauma, of those found in a reaction to an acute inflammation, and it is likely to be an example of an acute inflammatory condition with an acute splenic tumour which has ruptured spontaneously." The weight was 280 g. Axillary lymph glands showed microscopical evidence of subacute lymphadenitis; this finding was confirmed by Dr. Robb-Smith. Bone-marrow films (taken immediately after death) revealed marked myeloid reaction, presumably due to inflammatory changes. The liver showed no abnormal changes.

**Past History.**—Steps were taken to trace the previous medical history of the patient. His Army record sheet showed that he had never been abroad. There was no history from the patient or from his unit of any injury within recent months. Apart from bronchitis he had had no other illnesses.

### Discussion

Zuckerman and Jacobi (1937) consider that minor degrees of torsion or of angulation of the splenic pedicle are sufficient to slow the circulation and to cause congestion of the spleen, resulting in rupture. They also consider that minor gastro-intestinal disorders may initiate the torsion or angulation and thereby cause the congestion and rupture. They found that the phrenico-splenic ligament is absent in about 2% of individuals; absence of this ligament is one of the causes of undue mobility of the spleen.

In the present case the serious condition of the patient prevented accurate anatomical investigation, but it was remarked at the time of the operation that the spleen was excessively mobile and thus splenectomy was a most simple procedure. It is therefore probable that the phrenico-splenic ligament was absent, and no restricting peritoneal bands were encountered. The patient had vomited before admission; this and the finding of food residue in the stomach, long after solid food had been taken, suggest that a gastro-intestinal disorder had developed. The presence of blood in the stomach may be attributable to obstruction of the vasa brevia by the same angulation or torsion that contributed to the rupture of the spleen. The presence of blood in the stomach and intestines has been reported in conditions of shock. The spleen in our case was not grossly enlarged; the structural changes were those representing the normal response of the spleen to a toxæmia and, as such, are to be expected in any acute inflammatory process. The rupture must therefore be regarded as being due to a mechanical process rather than to a pathological condition.

Ledderhose (1890) and Foucault (1923) considered that spontaneous rupture could occur only in a diseased spleen. Zuckerman and Jacobi have reviewed 28 cases of rupture of the alleged normal spleen, but accepted only 21 cases as genuinely normal. None of these was associated with acute inflammation. In their series spontaneous rupture occurred in 16 males and 12 females. The age incidence was: under 20 years, 2 cases; 20–30, 7 cases; 30–40, 6 cases; 40–50, 7 cases; 50–60, 5 cases. In 5 cases there was a history of epigastric distress related to meals, and in 5 cases the onset of

rupture was just after eating or drinking. Shock was noted in only 15 cases. Pain in the left shoulder was present in 3 cases and in the right shoulder in 1 case. Halliwell (1933) reported a case of spontaneous rupture of a normal spleen in which there was a long splenic pedicle. In Stretton's case (1926) rupture occurred in a female patient after coitus. In Susman's case (1927) the rupture occurred after the patient had bent down to lift a heavy object, and it was suggested that the contraction of the abdominal wall caused the rupture. Bohler (1933) reported a similar case occurring after the patient had bent to lift a heavy object. Abell (1933) recorded a case of rupture of a wandering spleen with torsion of its pedicle. In the cases described by Smith, Morrison, and Sladden (1933) and by Burnett and McMenemey (1935) splenomegaly was solely due to congestion, and in the former case pregnancy was thought to be a contributory factor.

In our own case the spleen was excessively mobile and rupture occurred at rest in bed. No gross pathological changes were discovered in the spleen beyond simple, inflammatory processes such as must exist in most septic conditions. Some gastro-intestinal disorder was indicated by the vomiting before admission and also by the post-mortem finding of undigested food residue in the stomach many hours after the preceding meal.

### Summary

A case of spontaneous rupture of an abnormally mobile spleen is described in which the rupture occurred while the patient was at rest in bed and in which there was no preceding accident.

A discussion of the causes of spontaneous rupture of the spleen and a review of the literature suggest that excessive mobility may subject the spleen to congestion by angulation or torsion of its pedicle sufficient to result in spontaneous rupture.

Our sincere thanks are due to Dr. Robb-Smith for reporting on the sections and for helpful criticisms.

### REFERENCES

- Abell, I. (1933). *Ann. Surg.*, 98, 722.  
Bohler, E. (1933). *Bull. Soc. Obstét. Gynéc.*, Paris, 22, 707.  
Burnett, E. C., and McMenemey, W. H. (1935). *British Medical Journal*, 1, 1122.  
Foucault, P. (1925). *J. Méd. Bordeaux*, 55, 1138.  
Halliwell, A. C. (1933). *British Medical Journal*, 1, 919.  
Ledderhose, G. (1890). *Disch. Chir.*, Stuttgart, pt. 45b, p. 147.  
Smith, A. H. D., Morrison, W. J., and Sladden, A. F. (1933). *Lancet*, 1, 694.  
Stretton, J. L. (1926). *British Medical Journal*, 1, 901.  
Susman, M. P. (1927). *Brit. J. Surg.*, 15, 47.  
Zuckerman, I. C., and Jacobi, M. (1937). *Arch. Surg.*, 34, 917.

## Medical Memoranda

### Achrestic Anaemia with Achlorhydria

Achrestic anaemia as first described by Israëls and Wilkinson is characterized by: (1) the findings of a macrocytic anaemia; (2) free HCl in the stomach contents; (3) a prolonged course which fails to respond to efficient anti-pernicious-anaemia therapy; (4) megaloblastic hyperplasia of the bone marrow; (5) the recovery of adequate amounts of the anti-anaemic principle from the liver. The aetiology is the failure to utilize the anti-anaemic principle or to mobilize it from the tissue stores.

Recently I have had under my care a case of achrestic anaemia differing a little from the above outline in that there was achlorhydria. Such a condition must be very rare.

### CASE HISTORY

A widow aged 56 was admitted to hospital, having complained for six months of dyspnoea, faintness, weakness of the arms and legs, extreme exhaustion, nausea, and vomiting. The symptoms were gradually getting more pronounced. Her appetite had been poor, but her weight was steady. She had received no previous treatment.

Examination revealed a pale woman who looked older than her years but showed no signs of wasting. The pulse was 100 and regular. The face was puffy and the teeth were carious. There were purpuric spots on the arms, chest, and abdomen, with oedema of the hands and feet. The tip of the spleen was just palpable, and the liver was enlarged 2 in. There were no enlarged lymph glands, and no other abnormality in the heart, lungs, C.N.S., or urine was detected. The blood count was: red cells, 715,000; white cells, 4,000; haemoglobin, 20%; colour index, 1.4. The film showed definite macrocytosis. Fractional test meals even with histamine revealed achlorhydria, with excess of mucus. The stools were always negative for occult blood.

The patient was immediately given one pint of citrated blood by the drip method. There was no reticulocyte response to intramuscular injections of hepalex, 10 c.cm. stat. and 5 c.cm. daily for two weeks, the reticulocyte count never going above 1%. This same hepalex gave good results in other cases of pernicious anaemia in the ward. She was repeatedly transfused, as transfusion seemed the only means of keeping her alive. She was given liberal allowances of ferrousol, redoxon, yeast, marmite, liveroid, venturulin, thyroid, and HCl dil. No one preparation or combination of preparations seemed to help. At times, quite independently of treatment, there were definite remissions, and on one occasion the haemoglobin rose to 58%. No cause for these remissions could be detected. During one of them her carious teeth were extracted, but even this did not appear to affect her progress.

After being treated for a year the patient died of bronchopneumonia. At the necropsy (by Dr. W. Whitelaw) the pathology of the intestinal tract was a chronic gastritis. The femoral bone marrow was extremely hyperplastic. The heart was not enlarged, and the myocardium was pale. The lungs gave the findings of bronchopneumonia. There was much free iron in the liver, kidneys, and spleen. On microscopical examination the bone marrow was seen to be megaloblastic.

This case presented most of the characteristics of achrestic anaemia, as there were the findings of a macrocytic anaemia, failure to respond to efficient anti-pernicious-anaemia therapy, and a megaloblastic hyperplasia of the bone marrow. Achlorhydria is certainly very unusual, but Israëls and Wilkinson (1940) have suggested that it might occur in achrestic anaemia, and state that they had one such instance. In my case the achlorhydria may have been due to the chronic gastritis, the result of dental sepsis. Unfortunately there were no facilities for testing the amounts of anti-anaemic principle in the liver, but there is enough evidence to substantiate the case without this.

I wish to thank Dr. John F. Wilkinson, Liverpool, for his help and advice; Dr. T. M. Anderson, medical superintendent, Dudley Road Hospital, Birmingham, for permission to publish the case; and Dr. W. Whitelaw, pathologist, Dudley Road Hospital, for his post-mortem findings.

A. A. HUSE, M.D., B.Sc., M.R.C.P.

Senior Physician, Dudley Road Hospital, Birmingham.

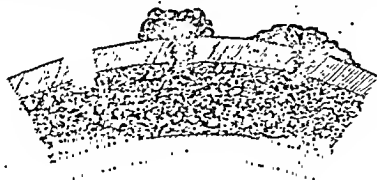
#### BIBLIOGRAPHY

- Davidson, L. S. P. (1932). *Quart. J. Med.*, 25, 543.  
 Israëls, M. C. G., and Wilkinson, John F. (1936). *Ibid.*, n.s. 5, 69.  
 — (1940). *Ibid.*, n.s. 9, 163.  
 Vaughan, J. (1934). *The Anaemias*, London.  
 Whitley, L. E. H., and Britton, C. J. C. (1942). *Disorders of the Blood*, London.

### A Proposal to Prevent Necrosis of the Tabula Externa of the Skull denuded of Periosteum

In extensive scalp wounds in which a large area of the skull is deprived of the periosteum the tabula externa undergoes necrosis unless it is covered by skin within a reasonable time. A free graft has very little chance of success in these circumstances because of the poor blood supply of the host tissue, and a pedicle graft may encounter technical difficulties. In my experience the following new method has been helpful:

Multiple burr-holes are made by a hand drill into the whole denuded area of the external table. The holes are 2 to 4 mm. in calibre and 15 mm. apart. They should penetrate into the diploe—a fact indicated by slight bleeding from the bone. In about 7 to 10



Drawing showing, at different stages, the granulations growing out of the diploe.

days granulation tissue originating from the diploe will appear through the holes and spread flatly over the tabula externa surface. The drawing shows the granulations at different stages. In a few days' time the granulations are sufficiently confluent to provide a good blood supply, and are then covered by a Thiersch graft. The graft is treated in the usual manner. The denuded area should be covered from the beginning with a 10% cod-liver-oil-vaseline ointment in order to prevent drying.

Whether this method would be useful or not in cases in which there is already some necrosis of the external table is not yet certain, and only future experience will show; but it is certainly worth trying.

D. ENGEL, M.D., F.R.C.S.Ed.,

Resident Surgical Officer, King George Hospital, Ilford.

## Reviews

### ENCEPHALOGRAPHY

*Encephalography.* By E. Graeme Robertson, M.D., M.R.C.P., F.R.A.C.P. Monographs from the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne. No. 2. (Pp. 105. 32s. 6d.) Melbourne and London: Macmillan and Co.

The invention of encephalography, by which is meant radiography of the brain after the introduction of air by the lumbar route, put at the disposal of neurologists a diagnostic technique the value of which is still too little appreciated. Dr. Graeme Robertson's book would be of value; therefore if it did no more than bring home to the physician how much can be learned by means of encephalography when this is carried out by an expert.

Robertson gives a detailed account of his technique with a discussion of its anatomical basis. Encephalography carefully carried out may be expected to yield information about the contents of the posterior fossa, including the fourth ventricle, the aqueduct of Sylvius, the third and lateral ventricles, and the cerebral subarachnoid space. The author might perhaps have stretched his title enough to include a chapter on myelography, in which air is used in the diagnosis of obstructions of the spinal subarachnoid space. The value of encephalography in the diagnosis of intracranial tumour is well known. Dr. Robertson thinks that its usefulness in the diagnosis of post-traumatic headache and epilepsy has probably been overestimated, but it gives considerable help in the recognition of degenerative lesions, and may help to distinguish between cerebellar degeneration and neoplasm.

The illustrations are numerous and beautifully reproduced, and line drawings are used with advantage to interpret the skiagrams.

### OCCUPATIONAL THERAPY

*Principles and Practice of Rehabilitation.* By John Elsie Davis, M.A., Sc.D. (Pp. 211. 53.00.) New York: A. S. Barnes and Co., Inc.

This book is mainly concerned with methods of rehabilitation that have been found useful for the mentally ill. The term "rehabilitation" as used by the author is practically synonymous with the older term "occupational therapy." The emphasis is on the scientific approach; each individual has to be assessed for his assets as well as his liabilities before a plan of rehabilitation is drawn up. Attention is paid first to the individual's peculiarities and then to the problem of his socialization. The author points out the importance of the gap that is apt to exist between the kind of activities available in hospital and the kind of work that the patient will be expected to face when he has to re-establish himself as a wage-earning unit in the world outside. In the treatment itself the author reminds us that we have on the one hand to be content to begin with very simple activities to suit the patient's level of performance; but that, on the other hand, his self-esteem must not be hurt by introducing him to a childish type of occupation.

The book contains a discussion of principles and seems to come down on the side of work as an end in itself. Galer is quoted to the effect that work is Nature's best physician. Nevertheless the author does not fail to emphasize as well what work means in terms of self-esteem. Examples from the experience of countries at war are added as illustrations, and the point is made that a better community organization, in peacetime might maintain as useful members of the community many individuals who ordinarily become chronic neurotics, or at least a burden to themselves or others.

### CLINICAL PATHOLOGY

*Clinical Laboratory Diagnosis.* By Samuel A. Levinson, M.S., M.D., and Robert P. MacFate, M.S., Ph.D. Second edition, thoroughly revised. (Pp. 950; illustrated 48s.) London: Henry Kimpton, 1943.

It is doubtful whether anyone can be an authority on all branches of clinical pathology, and somewhat doubtful whether a single book can properly cover the whole subject: individual works on bacteriology, haematology, pathological chemistry, histology, and toxicology are likely to be better sources of information. There are nevertheless several American omnibus

extbooks which attempt to cover the whole field of laboratory work in relation to medicine, and among the more comprehensive is Levinson and MacFate's *Clinical Laboratory Diagnosis*. In the second edition of this work one unusual feature in the original volume has been omitted: this was a full set of instructions for conducting a practical course in the subject for students. Much has happened during the past six years, and additions consequently more than balance this loss: these include a description of photometric methods for chemical estimation, a discussion of acid-base balance, the study of marrow films, and the new complexities of blood grouping, as well as various new chemical estimations. The redundant and misleading list of "Common Infectious Diseases and the Causative Organisms" which we criticized in the first edition has been omitted; the table of characters of individual bacteria has been expanded to 30 pages, and includes many non-pathogenic species. In a work of such immense scope it is useless to expect that every section shall be faultless or complete; on the other hand, most clinical pathologists if they delve in it long enough will probably find something new and useful.

### STINGING FISHES

*Sting-fish and Seafarer*. By H. Muir Evans. With drawings by Irene Hawkins. (Pp. 180; illustrated. 15s.) London: Faber and Faber.

If you are curious about fishes which sting, and if you are curious about a fellow general practitioner who finds time to become an authority on a branch of natural history, you should read this book. It is attractively printed, clearly illustrated, and not very long, so that no one can have the excuse that it is too large a work for a busy man. In these days when the pursuit of science is regarded as a whole-time job it is pleasant to find a scientist of the old school, an amateur in the true sense of the word, who succeeds in finding much that is both interesting and new. For example, in the fish-market in Madeira "picture to yourself a long snaky-looking animal, as jet black as black patent-leather, of the shape of a flat inner tube of a motor tyre, ending with the head of the greyhound form, with wide gape and monstrous long teeth, and enormous eyes, and the tiny bifurcate fin attached to the tapering tail . . . in addition it carried a curious dagger-like spine behind the vent. Cesar de Noronha published a monograph in Portuguese (1925) on the black scabbard fish, which is little known, and this is what he says: 'Near the anal orifice is a terrible offensive weapon consisting of a short strong spine.' Thus it scarcely needs saying that Dr. Muir Evans is not only a naturalist but that he knows how to write and how to bring his dragons vividly to the reader's fancy. You can learn too of the white scabbard, "a beautiful glistening white fish . . . clothed with silver tissue." In New Zealand it has the name of the "frost fish," because on cold nights it has been known to swim towards the shore in vast numbers, ere to be heaped up in a ridge of corpses. Dr. Muir Evans leaves this to be an example "of the mass migratory molation that has been described in lemmings and spring-ouck." But if you want to know about the springbuck you must read it in the book!

### Notes on Books

*Same Psychology: A Biological Introduction to Psychology*, by Prof. R. J. S. McDOWALL (John Murray; 9s.), is really the second edition of *A Biological Introduction to Psychology* enlarged and rearranged. Like its predecessor it seeks to introduce the student to psychology from a basis of elementary biology. This means that the psychology must be very elementary also. Provided that the book is regarded strictly as an introduction it will serve its purpose, but the trouble is that so many superficial students never get beyond such an introduction and think that when they have read such a book they know all that is necessary to set up as a practical psychotherapist. Looked at from this point of view, which is admittedly unfair, it becomes obvious that the author has had little or no experience of treating the individual patient. The chief additions are the chapters on the effect of mind on body, in which the author fails to make a clear distinction between a conversion symptom and the emotionally induced disturbances of the autonomic nervous system, and the effect of body on mind, in which the "organic" psychoses and fatigue syndromes are briefly referred to. The descriptions of the various schools of psychology are so brief as to be almost ludicrously

inadequate, and the appendix of case histories drawn from the writings of others certainly does not carry the conviction which would be felt if the cases were drawn from the author's own experience.

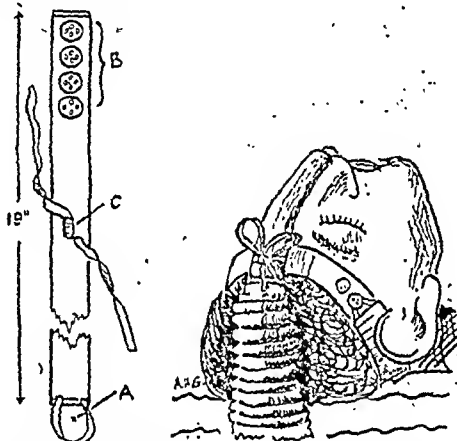
The Child Health Planning Group (hon. secretary, Dr. J. D. Kershaw, Public Health Department, Town Hall, Accrington, Lancs) has issued a pamphlet, *Education and Health*, dealing with various aspects of the health and well-being of the child and the adolescent, with special reference to school environment and the general system of education. The price of a single copy is 3d., post free.

## Preparations and Appliances

### THE KING'S COLLEGE HOSPITAL ENDOTRACHEAL HARNESS

Dr. A. H. GALLEY, of King's College Hospital, writes:

Your recent account of the Hudson endotracheal harness prompts me to describe a similar device which has the advantage of being home-made. It consists of 19 in. of garter elastic, preferably white, and from  $\frac{1}{4}$  in. to 1 in. in diameter. As will readily be seen from the accompanying diagrams, one end has a loop of tape (A) sewed on, sufficient in length to slip over any of the buttons to be described later. Near the other end four rubber- or linen-covered buttons are attached (B) in line, along the axis of the harness and about  $\frac{1}{4}$  in. apart. Buttons  $\frac{1}{2}$  in. to  $\frac{3}{4}$  in. in diameter are the most suitable. About 6 in. from the button end a length of tape (10 in. is ample) is sewn on to the elastic band so as to leave two free ends of equal length (C). The elastic should be hemmed at both ends to prevent fraying.



When in use the harness is placed around the head in such a position that the attachment of the tape (C) is in the centre of the forehead and the two free ends are tied in a bow around the rubber extension of the endotracheal tube. The loop (A) is then slipped over an appropriate button, leaving the band in slight tension and the rubber extension tube fixed firmly in place. Untying the bow and loosening the loop frees the harness in a matter of moments.

This harness first came into use at King's some ten or eleven years ago, when I was resident anaesthetist, and so far as I am aware no single person claims to have invented it. Like Topsy, "it just grewed." The only part I had in its evolution was to increase the number of buttons from one to four and to suggest the use of rubber buttons. Despite this, it is known in certain irreverent quarters as "Galley's garter"!

No doubt such a simple and obvious piece of apparatus must have been thought out and employed in other institutions, but so far I have never seen it described in any medical publication.

### AN AMPOULE INJECTOR

Burroughs Wellcome and Co. have developed a unit injection device, the "monoject" brand ampoule syringe, to meet the needs of the Forces in the field. It presents a single parenteral dose of sterile solution of morphine or other drug, sealed in a collapsible tube with a welded closure and a sterile hypodermic needle mounted in the nozzle. The needle is protected from damage and contamination by a plastic cap which is threaded and sealed on to the nozzle of the tube. Removal of the cap and piercing the internal seal with the pin provided renders the ampoule syringe ready for immediate use. The manufacturers state that their entire output of "monoject" brand products is at present reserved for the armed Forces; they hope to be able to meet civilian requirements in the near future.

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EFFECT OF ANAESTHETICS ON GASTRIC  
TONE AND MOTILITY

In the serious, though comparatively rare, condition of acute dilatation of the stomach gas and large quantities of fluid may accumulate within it. The accumulation of fluid means corresponding losses from other parts of the body, and losses of sodium and chloride: also alkalosis, and possibly tetany. Unless the fluid and electrolyte balances are soon restored death ensues. It appears from the work of Dragstedt and others<sup>1,2</sup> that once the stomach has lost its tone its own secretions stagnate there, as it cannot pass them on to the absorbing part of the gastrointestinal tract lower down. The secretions are lost by regurgitation through the oesophagus, or else they accumulate in the stomach, causing distension, which may be further increased by regurgitation of fluid from the duodenum. In the later stages the distension may act as a stimulus to increased secretion by the stomach, and the pressure of the enlarged stomach may obstruct the lower part of the duodenum. Acute distension of the stomach has been observed in association with several conditions—e.g., in severe diabetes, after an attack of migraine, in the course of pulmonary tuberculosis, or post-operatively; most often, it is claimed, after laparotomy under general anaesthesia. It seems probable, therefore, that acute distension may result from several different causal factors operating together or singly, and among these anaesthesia and various operative procedures are of special interest.

In order the better to assess the role of anaesthesia Johnson and Mann<sup>3</sup> have recently investigated in dogs the effects of different agents and depths of anaesthesia upon gastric tonus and movements. They used animals in each of which a permanent gastric fistula of the Mann-Bollmann type had been made several weeks previously. Through the fistula a balloon was inserted and connected to a recording manometer. For these experiments the animals were in a fasting condition, and observations were made for a control period of 15 to 30 minutes each time before the induction of anaesthesia. The following different agents or combinations of agents were used in different experiments: ether, nitrous oxide and oxygen, nitrous oxide and oxygen with ether, ethylene and oxygen, ether supplementing basal anaesthesia with bromethol (avertin), cyclopropane and oxygen, cyclopropane and oxygen supplementing basal anaesthesia with bromethol, intravenous pentothal sodium. The depth of the anaesthesia was found to be the most important factor: the deeper the anaesthesia, the greater the reduction of gastric tone and motility. Generally, anaesthesia carried to plane 2, stage III, according to

Guedel's criteria,<sup>4</sup> resulted in much-reduced gastric tone and disappearance of motility. Of course, some anaesthetic agents—e.g., nitrous oxide or ethylene—cannot give an anaesthesia of the depth specified. To reach that depth the action of these agents was, in some experiments, reinforced by producing a certain degree of anoxia. The effects on gastric tone and motility were the same as when more potent agents were used without the aid of anoxia. Apparently the effects of anoxia and of anaesthetics upon the stomach are additive.

Johnson and Mann also studied the return of gastric tone and motility after anaesthesia, and the influence of duration of anaesthesia upon the restoration of these. Usually, tone came back before motility, or else they reappeared together. The time required varied widely in individual animals. After ether anaesthesia it was usually 2 to 3 hours, but extremes of 1½ and of 10 hours were observed. In some dogs tone and motility were resumed more rapidly than in others, no matter what anaesthetics were employed. On the whole the times needed for restoration were not very different after the different agents or combinations of agents. A few experiments were made on the effects of lengthy ether anaesthesia. The times needed for restoration of tone and motility were found to be prolonged little, if at all. This is in agreement with Cannon and Murphy's<sup>5,6</sup> finding that in cats ether anaesthesia of long duration prolonged the gastric emptying time little more than ether anaesthesia of short duration. Premedication with atropine and morphine to a degree of drowsiness judged to be comparable with that often produced in man, however, nearly doubled the time needed for the restoration of tone and motility after ether anaesthesia. Johnson and Mann found that after bilateral splanchnicectomy or double vagotomy, or after both operations, the changes brought about in gastric tone and motility during anaesthesia by various agents and during recovery were the same as before those operations. It seems, therefore, that the actions of the agents studied are mainly upon the peripheral motor system of the stomach, with its local neural and muscular components, and that reflex effects through the extrinsic nerves are small.

What remains to be seen is how far the foregoing results hold good for man. Assuming that they do, then it follows that morphine is by no means the ideal agent for pre- and post-operative medication. A substitute for morphine which has its sedative and analgesic actions but not its actions upon the gastro-intestinal tract and respiration is as desirable as it ever was; likewise, a substitute for atropine which inhibits gastro-intestinal activity less. The varying effects of different anaesthetics upon gastric motility and tone are apparently small in comparison with differences between the effects of light anaesthesia and of fairly deep anaesthesia. Depression of gastric tone and motility is more probable after fairly deep anaesthesia, as in abdominal surgery, than after light anaesthesia. How far can such depression resulting from fairly deep anaesthesia be avoided or reduced? A heavy-handed surgeon is likely to require a deeper anaesthesia than his gentler colleague, inasmuch as he is likely to evoke any stretch reflexes which

<sup>1</sup> *Surg. Gynec. Obstet.*, 1931, 52, 1075.<sup>2</sup> Dragstedt, L. R., in Lewis, Dean, *Practice of Surgery*, 6, chap. 10, pp. 1-15.<sup>3</sup> W. F. Prior Company, Hagerstown, Md. 1940.<sup>4</sup> *Surgery*, 1942, 12, 599.<sup>5</sup> Guedel, A. E., *Inhalation Anaesthesia*, p. 14. Macmillan, New York. 1937.<sup>6</sup> *Ann. Surg.*, 1906, 43, 512.<sup>7</sup> *J. Amer. med. Ass.*, 1907, 49, 840.

remain and so hinder his own work. But whether or not this happens, the anaesthetist's aim must be to provide the surgeon with adequate muscular relaxation for the operation intended, and at the same time not to depress the patient by deeper and lengthier anaesthesia than is necessary. In pursuit of these aims the skilled anaesthetist can anticipate the surgeon's needs and accordingly shorten the periods of deeper anaesthesia. This is not, however, the only method available to the anaesthetist; among others are spinal anaesthesia and the combination of peripheral nerve block with light general anaesthesia. In their experiments on dogs Johnson and Mann found that even when spinal anaesthesia extended to the upper thoracic or the lower cervical region gastric tone and motility were depressed. This forms an interesting contrast with the well-known effect of spinal anaesthesia in causing increased activity of the small intestine—an observation, moreover, which according to the authors is not accounted for by reflex stimulation of the splanchnic nerves, as it could be repeated after previous splanchnicectomy, and which also is not accounted for by any action of their local anaesthetic (procaine hydrochloride) mediated through the blood stream, because the injection of quite large amounts of procaine near the spinal cord did not influence gastric tone and motility. Johnson and Mann did not investigate the second of the alternative methods mentioned earlier—the combination of nerve block with light general anaesthesia. But it may have advantages over general anaesthesia, particularly for abdominal surgery, not only in depressing gastric tone and motility less but also in depressing reflex activity in other parts of the body less—e.g., the regulation of blood pressure. It would seem that when procaine is injected near the spine the effects of this via the blood stream upon gastric tone and motility are small, and that the second alternative method is well worth further investigation.

Beyond those considerations, which are connected with the anaesthetic and its administration, there are others certainly not less important. For example, nothing in Johnson and Mann's work diminishes the significance of Cannon and Murphy's<sup>3</sup> x-ray studies of the emptying of the cat's stomach. They found that, whilst ether anaesthesia and laparotomy delayed the emptying somewhat, these effects were small in comparison with those of handling the digestive organs. Even quite gentle handling delayed the emptying considerably. In this connexion their observation that handling of the small intestine inhibited gastric activity is another which cannot be accounted for by reflex stimulation of the splanchnic nerves, as the inhibition occurred equally after splanchnicectomy (Cannon and Murphy<sup>3</sup>).

While Johnson and Mann's work makes clearer the influence of some of the factors concerned in acute gastric dilatation, nevertheless more knowledge of the effects of various operative procedures is needed. The treatment of acute dilatation, once the condition arises, remains symptomatic—namely, aspiration of the collected gas and fluid in the stomach (Paine and Wangenstein<sup>4</sup>), together with replacement of the lost fluid and electrolytes, usually by the intravenous route.

## SKIN DISINFECTION

Much the commonest clinical use for disinfectants is for the sterilization of the skin, yet there is still remarkable difference of opinion about the merits of various agents for this purpose. Some explanation for this is to be found in the great diversity of methods employed for testing them: treated skin has been swabbed, scraped, or actually excised, and cultivated in various ways with or without attention to the pitfalls which beset sterility tests of material still containing disinfectant. The very elaborate method recently evolved by Price has been used with minor modifications by C. A. Hatfield and J. S. Lockwood.<sup>1</sup> This consists first of ten successive scrubblings of the hands each with a fresh sterile brush and a weighed amount of soap powder, following an exact ritual and timed with a stop watch to last 1 minute, the lather being then washed off with 1 litre of sterile water into a sterile basin. The disinfectant is then applied, and after its action five more identical scrubblings and rinses are carried out. Pour plates are then made with a measured inoculum from each of the 15 basins, and colonies counted. The count per c.c.m. of rinse water falls, steeply at first, from an initial 10,000 or so to about 600, and there remains: in other words further scrubblings continue to remove about the same number of bacteria. Intervening treatment of the skin by an efficient disinfectant permanently depresses the counts, and the last five are then on a much lower level. Tests by this laborious method award first prize to tincture of iodine followed by alcohol, and second to alcohol alone. There is no reason for doubting the significance of these findings, and those who like to conclude from them that old-fashioned remedies are best may do so; but let it be observed that iodine and spirit are both in very short supply in this country at present; we are in fact asked not to use either when anything else will serve. It should also be pointed out that a good disinfectant for normal skin may be a very bad one for a wound, and that whatever spirit may do to skin—and this, by the way, is not to sterilize it completely—it should certainly not be relied on for sterilizing instruments. Various unnamed mercurial "tinctures" whose identity can be guessed gave poor results, and so did a synthetic detergent; but the test was scarcely fair to this, because substances of this class are neutralized by soaps.

Among other recent experimenters in this field F. Neufeld and O. Schütz<sup>2</sup> also commend alcohol, but for different reasons. Advocates of the synthetic detergent are many. J. Frankl<sup>3</sup> and E. Gottsacker<sup>4</sup> extol the virtue of "zephyrol," which, it should be remembered, was first introduced by no less an authority than Domagk. Each of these authors stresses the persistence of its action: sweat inside a surgical glove is sterile after two hours' wear if the hand has previously been disinfected with zephyrol. If this is really so it should be the answer to staphylococcal infection of clean operation wounds caused by minute perforations of the surgeon's gloves. Zephyrol (in the U.S.A. "zephyran") has not been seen much in this

<sup>1</sup> *Surgery*, 1943, 13, 931.

<sup>2</sup> *Z. Hyg. Infektkr.*, 1941, 123, 396.

<sup>3</sup> *Klin. Wochschr.*, 1941, 20, 864.

<sup>4</sup> *Arch. Hyg. Bakt.*, 1942, 123, 11.



country, but we now have our own disinfectant of this type in CTAB—cetyltrimethyl ammonium bromide—first favourably reported on by J. M. Barnes.<sup>5</sup> For the disinfection of normal skin, the preliminary cleansing of superficial wounds and burns, and the disinfection of baths, bowls, and certain instruments, such compounds have qualities that should strongly commend them.

Two other ingenious methods of testing a skin disinfectant have been advocated. H. Habs and K. H. Kirschner<sup>6</sup> heavily contaminate shaven guinea-pigs' skin with *Ps. pyocyanea*, treat it with disinfectant, and cultivate multiple excised fragments of skin in broth containing malachite green; this inhibits the growth of skin bacteria but not that of *Ps. pyocyanea*, and thus gives a clear-cut result. W. J. Nungester and Alice H. Kempf<sup>7</sup> go perhaps one better by infecting a mouse's tail with virulent pyogenic cocci, and after disinfectant treatment cut off half an inch and place it in the peritoneal cavity: this test—evidence of bacterial survival being a fatal peritonitis—more often gave a positive result than simple cultivation. The time will perhaps never come when this welter of miscellaneous methods is replaced by a single universally recognized technique for testing skin disinfectants. Medical literature would lose some of its novelty if this were to happen, but the unfortunate user would be able to formulate clearer ideas.

## DOCTOR AND PATIENT

It is a common complaint against the hospitals that patients are not told enough about their illnesses and that there is almost a conspiracy on the part of doctors and hospital authorities. What the psychologist calls "channels of communication" become increasingly important and at the same time harder to keep open as an organization grows in size and complexity. In fact communications can be maintained only by persistent and conscious endeavour. A patient attends a hospital for treatment of an inguinal hernia and is found, to his misfortune, to have some lesion of which he was wholly unaware, such as coarctation of the aorta or an early Paget's disease. Before he knows where he is, he is an inmate of a medical ward and is submitted to investigations that have no obvious relevance to his complaint. Finally he is discharged, still with his hernia and naturally disgruntled. Students and housemen need a frequent reminder that they should on no account let a patient out of hospital without making sure that they know what he actually came in for and whether he is satisfied. They should also realize that—with the growth of contributory schemes and payments for services rendered on the one hand, and, on the other, the subvention of medical education by Government grants, research funds, and hospital facilities—it is more appropriate to look upon the medical student as the recipient of charity than the patient. Most consultants would confess that they learn more from their private patients than from their hospital patients. This is often put down to the superior intelligence of the former. Nevertheless, other factors such as expenditure of time and psychological attitude are different, and the student should be taught that the nearer he can get to the private-patient relationship in studying his hospital patients the more he will learn about his art. It

is unfortunate that so many medical students have to be trained in large cities such as London, where teaching hospitals have less local responsibility than in smaller cities and where the spirit of an old-established charity still haunts the wards. They get a better discipline in the relationship of hospital, doctor, and patient if they work in a small provincial centre—particularly if they regard the local weekly paper as one of their most important texts. What happens in the hospital is not merely news: it is a major interest of the community. In such a centre the student will learn most rapidly the unwisdom of operating on advanced malignant disease or of carrying out risky diagnostic procedures unless he has made certain that the patient and the relatives fully realize and accept the position. It is easy to be thoughtless of the individual when medicine is organized on the lines of quantity production, as it is in large hospitals and in industrial establishments. And care must be taken that no bafflement or disillusion of the individual taints the health centres and unit hospitals which make such a brave showing in pictures of the future.

The industrial medical officer obviously runs the risk of working across the grain rather than with it in his dealings with the worker. He is peculiarly liable to be 'affiliated with "they" and "them," those paranoid fantasies, on which we all vent our spleen—and will continue to do so whatever "ism" we live under. Just as the primary interest of the hospital doctor is diagnosis, so the primary interest of the factory doctor is maintenance of a low sickness rate. In the one case patients tend to become "clinical material," in the other they become "labour," unless we are always mindful of our professional failings. Yet the industrial medical officer is often justified in his complaints against the private practitioner. One of the main purposes of doctors is to keep people at work, both for their patients' sake and for the sake of the country. It is very wrong, therefore, for a private practitioner to attribute banal symptoms to industrial processes of which he knows nothing, to give long holidays for trivial maladies, or to declare a worker unfit for a particular job on eleemosynary rather than scientific grounds.<sup>1</sup> Medicine has a duty to both the individual and the community, and, whatever state of society we live under, we can never be absolved from the task of bringing harmony between them.

## VASCULAR SUPPLY OF NERVES

Hitherto more attention seems to have been bestowed on the nerve supply of vessels than on the vascular supply of nerves. The importance of the latter was, however, fully appreciated by some of the earlier anatomists and physiologists, and W. E. Adams of Leeds has done valuable service in presenting a historical review of the subject in which he discusses the anatomical and physiological findings of early and recent research workers.<sup>2</sup> These provide an explanation for many of the procedures which have been adopted during the last 50 years by such practical nerve specialists as Weir Mitchell, Victor Horsley, René Leriche, François Frank, Harvey Cushing, and others. The anatomical evidence includes observations on the vascular supply of: (1) peripheral nerves; (2) the spinal and cranial ganglia and their roots; (3) the sympathetic nervous system; (4) vascular plexuses around cell centres and nerves in embryos; (5) intraneural plexuses; (6) the innervation by non-medullated nerves of the tunica media of nutrient arteries running in the epi- and peri-neurium, and the termination of some non-medullated fibres in end-

<sup>5</sup> *Lancet*, 1942, i, 531.

<sup>6</sup> *Z. Hyg. u. Bakt.*, 1942, 124, 557.

<sup>7</sup> *J. Infect. Dis.*, 1942, 71, 174.

<sup>1</sup> Babey, A. M., *J. Amer. med. Ass.*, 1943, 112, 395.  
*J. Anat.*, 1942, 76, 323.

bulbs indicating an afferent sensory function for these fibres, the "nervi nervorum" thus being both efferent and afferent—the efferent fibres controlling the calibre of the vessels supplying the nerve and the afferent fibres conveying sensory impulses; and lastly the veins of nerves, which have been specially investigated by Quénu and Lélars.<sup>2</sup> Anatomically the nutrient arteries of the nerves are not end-arteries, there being a continuous longitudinal anastomosis within each nerve. Tonkow also distinguishes between "arteriae nutritiae" and "arteriae comites," though the latter, which may run in or on the nerve, sometimes give off arteriae nutritiae. From the practical standpoint a knowledge of the intrinsic vascular supply of nerves is valuable in relation not only to the regeneration of peripheral nerves but also to the severe symptoms which may follow ischaemia of nerves. Of practical significance, too, is the recognition that the intrinsic arteries of peripheral nerves are separately supplied by prolongations of the sympathetic system and are subject to changes in that system. These changes appear often to underlie such conditions as causalgia, post-traumatic spreading neuralgias, vasoconstrictor and vasodilator disturbances such as Raynaud's disease, angioneurotic oedema, angina pectoris, and some obliterative affections of the arteries and veins. Mayer found that if the facial nerve of the rabbit is devascularized *in situ* it loses its excitability in 15 to 30 minutes. Fröhlich and Tait obtained similar results with the sciatic nerve of the rabbit. Okada produced degeneration of the sciatic nerve of the rabbit simply by dividing the inferior gluteal artery. This experiment, as Adams points out, is significant because it shows that the occlusion of a single regional vessel may exert a profound effect on the nerve which it supplies, and also that this type of degeneration—"ischaemic"—differs from Wallerian degeneration in that there is no actual interruption in the continuity of the axis cylinder. It has also been demonstrated that ischaemia need not be complete before it affects the transmission of both motor and sensory impulses. Moreover, Lewis and others have shown, by the use of a clamp, that revascularization following a localized ischaemia produced by temporary pressure on a nerve is attended by recovery from paralysis and changes in the nerve which are interpreted as the subjective sensation of tingling. Clinical evidence, as well as that furnished by operation on the human subject, thus appears to be substantiated by the anatomical-physiological observations collated by Adams. Further, the curative or alleviating effects claimed for such operations as division of the sensory root of the trigeminal nerve and excision of the stellate ganglion or its infiltration with novocain in the treatment of angina pectoris have their justification.

### THE SENILE PUPIL

Rigidity and contraction of the pupil in the aged has a practical significance when dilatation is needed for therapeutic or diagnostic purposes. That the underlying pathological state is sclerosis of the iris vessels is suggested by the occurrence of miotic and sluggish pupils in patients suffering from hypertensive diseases. Larsson and Österlind<sup>4</sup> examined the eyes of fourteen persons aged between 69 and 85 years, and their material formed a continuous series of irides with different powers of pupil dilatation, from absolute immobility to good function. Clinically the changes were depigmentation of the free pupil margin; in advanced cases this goes on to the formation of a structureless, greyish-white, homogeneous membrane. But

these changes in themselves are not definitely related to the changes in power to dilate. Histologically sclerosis of the iris vessels was an outstanding feature, and seemed directly proportionate to the degree of pupil immobility. Hyaline degeneration of the free pupillary border and of the connective-tissue layer between the sphincter and the pigment epithelium was present in the more severe cases. Clearly related to pupil immobility were degenerative changes in the sphincter and dilator fibres of the iris musculature. The authors hold that senile miosis is primarily the result of arteriosclerosis; subsequent degeneration of the iris musculature and hyaline changes intensify the condition. Each one of these affections will make normal dilatation more difficult but not impossible. In combination they result in complete immobility of the pupil.

### TRAINING OF THE ANTHROPOLOGIST

The study of man as a social being has an obvious bearing on the work of reconstruction. Anthropological teaching and research have never yet perhaps received the serious attention which their importance demands. This was largely the theme of Prof. F. C. Bartlett's recent Huxley Memorial Lecture delivered before the Royal Anthropological Institute. So far as university teaching is concerned the Cambridge Professor of Experimental Psychology holds that the training for anthropology should be postgraduate. Human sciences—and anthropology most of all—demand a maturity of outlook and a certain compendious knowledge which can hardly be expected of very young students. In his view the particular school of graduation does not matter very much; in some cases it may well be the school of human experience itself. But he thinks that a special welcome should be accorded to the very best graduate material that the biological and physical sciences can produce, and that efforts to interest this material should be made. Anthropology should seek active working relationships with nearly every other department in the university. It should itself constitute a prolonged experiment in culture contact. Prof. Bartlett went on to indicate three developments which he thinks of vital importance to anthropology. The first is the study of scientific methodology, as important to anthropology as it is to medicine, and for very nearly the same reasons. In both these fields conclusions and decisions have to be made on the basis of behaviour signs which require great skill and insight for their interpretation, and these signs must be interpreted on a basis of scientifically attested knowledge which is constantly and rapidly extending. The second is the manifold use of experiment. Prof. Bartlett wants every anthropological department to have an attached laboratory, or at least to be in very close working relation with suitable laboratories in other departments, so that the student may learn by practice the experimental basis of evidence, the controls necessary and possible in the comparative study of smallish groups, and whatever equipment of tests is likely to help him along his special line of interests. Finally, he said that everybody who is going to be an anthropologist should be encouraged to learn the value, the power, and the limitations of the tools which the statistician can place in his hands. The lecture was a plea for much more thorough organization and research as the basis of anthropological training.

We much regret to announce the death in retirement at Lossiemouth of Dr. John S. Fairbairn, consulting obstetric physician and gynaecologist to St. Thomas's Hospital, formerly Chairman of the Central Midwives Board for England and Wales and President of the Royal College of Obstetricians and Gynaecologists.

<sup>2</sup> *Études sur le Système Circulatoire*, 1894, Paris.  
<sup>4</sup> *Acta ophthal.*, 1943, 21, 1.

## REVACCINATION OF AN ARMY UNIT

BY

P. N. COLEMAN, M.B., Ch.B.

Captain, R.A.M.C.

In the description of vaccination in most standard textbooks of medicine little is said of the reaction to be expected on revaccination. It is very important, however, to distinguish the case in which a revaccination has "taken" with a minimum of reaction because of previous immunity from the case in which it has failed because of faulty technique. In a recent pamphlet issued by the Medical Directorate, G.H.Q., India (1942), this matter was emphasized, and it was pointed out that it is very rare even in the revaccination of persons successfully vaccinated several times previously for a reaction to fail to appear. The reaction is, however, evanescent, and might be missed if inspection of the vaccinated area is delayed until the sixth day. The pamphlet describes two types of reaction to be observed in the revaccination of previously immune persons: the "accelerated" reaction, in which a papule appears after about 36 hours, is maximum on the fourth day, and is subsiding on the sixth day; and the "immediate" reaction, in which the papule appears after 24 hours and is maximum in 48 hours. The following account of a case of smallpox which occurred in a British Army unit shortly after arrival in India, and of the subsequent revaccination of the whole unit, illustrates the points made in this pamphlet, and may therefore be of interest.

## Sequence of Events

On arrival at the port in India the troops were given shore leave, returning to the ship for the night. The next day they disembarked straight into a waiting troop train, in which they remained for the four-day journey to their new station. Twelve days after the shore leave a private soldier complained to his companions that he felt ill. The next morning he reported sick and was admitted to hospital with vomiting, pains in the limbs, and fever. Three days later a definite diagnosis of smallpox was made, and seven days after his admission to hospital he died from haemorrhagic smallpox. There had been no cases of smallpox or chicken-pox on the ship, so it is evident that he contracted the disease during the period of shore leave. He had not been vaccinated in infancy, but his records showed that he was vaccinated in the Army in 1940. No mark of this vaccination could be found.

The soldier was moving freely within the unit for about 18 hours from the time he first felt ill to the time of his removal to hospital. The entire unit of 938 men were regarded as possible contacts; the more probable contacts, however, were the 129 men of the man's own company, who all lived together in one barrack block. Precautions taken were the isolation of the company concerned, disinfection of all fomites, and the revaccination of all contacts. All the men of the company were revaccinated on the day notification of the case of smallpox was received—i.e., four days after the man first complained of feeling ill—and on the following day the rest of the unit were revaccinated. No further cases of smallpox occurred.

## Vaccination State of the Unit on Disembarkation

According to their documents all the men had been vaccinated within the previous five years—47 men in 1939, 713 in 1940, 56 in 1941, and 122 in 1942. They had arrived in the unit from many different parent units over a period of three years; thus their vaccination had been carried out by many different medical officers in many different stations.

## Response observed to Revaccination

As vaccination had been carried out within five years the full classical response to vaccination was not expected to occur in many cases. The arms were therefore inspected at 48 hours, 96 hours, and 6 days after vaccination. The results of a total of 938 vaccinations are given below.

In 656 cases (70%) the sequence of events was as follows: After 48 hours there was already quite a definite reaction. The region of the insertion showed a slight yellow exudate, surrounded by a red area about a quarter of an inch across. In 96 hours the red area was well marked, with a dried yellow exudate over the insertion but no true vesiculation. On the sixth day the reaction was fading rapidly, and in many cases all that then remained was a small dried-up exudate over the insertion. This is the "immediate" reaction described in the pamphlet. In a further 204 cases (22%) no definite reaction was observed after 48 hours, but the reaction had become quite definite after 96 hours, and was of the type described above.

It was fading rapidly by the sixth day, and never showed the classical response. This is the "accelerated" reaction described in the pamphlet. In 31 cases (3%) there was never at any time a very definite response, though even in these cases an area of erythema was observed after either 48 or 96 hours. These cases were regarded as giving a doubtful response, and vaccination was repeated.

Finally, inspection on the sixth day showed that 47 cases (5%) went on to the full classical response to vaccination. These had well-marked vesiculation going on to pustulation, a wider area of surrounding erythema, and axillary adenitis. Of these cases 18 developed a mild fever and had to be excused duty for a few days, though in no instance did any serious symptoms occur. The time taken for the classical response to develop was interesting. On examination after 48 hours, out of 47 cases which later gave the classical response only 11 (23%) were showing the signs of reaction, whereas out of 860 cases which gave the modified reaction 656 (76%) were already showing signs of reaction. Thus the modified response develops more rapidly and fades more rapidly than the classical response.

## Discussion

The value of vaccination in protecting a community from smallpox was once again demonstrated. The occurrence of a fatal case in a man apparently vaccinated three years before was unexpected and disappointing; on the other hand, the man was walking about freely among his companions, in the close conditions that barrack life entails, for 18 hours during the prodromal stage of virulent smallpox, yet no further cases occurred.

The number of completely negative responses to revaccination in a community previously vaccinated within five years was found to be small (3%). But in order to observe this it was necessary to inspect arms at 48 hours and 96 hours after vaccination as well as after 6 days. It is safer, therefore, to regard non-appearance of reaction as evidence of faulty technique, and to repeat vaccination, than to regard it as evidence of a solid immunity. Even after a large number of vaccinations the number of such repetitions will be small.

The proportion of cases which showed the classical response (5%) seemed surprisingly high. Presumably this meant that these cases were relatively non-immune. To what extent this was due to an abnormal rapid fall of immunity since the previous vaccination or to a faulty technique at this vaccination it is difficult to say. It suggests that on entry into an area in which smallpox is endemic it might always be advisable to revaccinate, whatever the record of previous vaccinations.

## REFERENCE

Medical Directorate, G.H.Q., India (1942) *A Note on Vaccination*

## Nova et Vetera

EDWARD TYSON, M.D., F.R.S.: 1650-1705

## A MODEL BIOGRAPHY

Dr. Edward Tyson has had to wait a long time for his biography, but he now has his reward.<sup>1</sup> If it be, as his biographer maintains, that the monograph he presented to the Royal Society of the anatomy of the chimpanzee in the summer of 1688 set a new model for anatomists, then it is only just that the *Life* now written should be a model for all medical biographers in the future. It is a model biography that has come from the pen of Prof. Ashley Montagu, who is anatomist at Hahnemann College, Philadelphia, and has made many contributions to his subject, particularly to the comparative anatomy of man and ape. Ashley Montagu, however, is much more than an anatomist. He is a man of letters, with a vivid pen and a love of books; he has enthusiasm and industry. He has searched the records of the Tysonian period for every scrap of information.

Tyson, who died a bachelor, was born in Bristol, spent ten years at Oxford University, took his M.D. at Cambridge, and came to London to practise medicine in 1677. Two years later he was elected to the Royal Society, in the proceedings of which he took a very active part, his contributions being chiefly medical and anatomical. At the age of thirty-four (1684) Dr. Tyson was appointed to two offices: he became reader in anatomy at Surgeons' Hall and was appointed physician to Bethlehem and to Bridewell

<sup>1</sup> *Edward Tyson, M.D., F.R.S., 1650-1705, and the Rise of Human and Comparative Anatomy in England. A Study in the History of Science.* By M. F. Ashley Montagu. With foreword by George Sarton. (Pp. 488, 546.) Philadelphia: The American Philosophical Society, Independence Square. 1943.

hospitals. His biographer claims for him that he was the first to give systematic courses in anatomy in London, that a modern lecturer could use his syllabus, and that he was the founder of modern comparative anatomy; he also claims that at Bethlehem Hospital Dr. Tyson was the first to use humane methods in the treatment of the insane.

Tyson's first paper, written while he was still at Oxford (1676), was on "The Scent-Bags in Poll-Cats"; years afterwards, when at Surgeons' Hall, he discovered and described the smegma glands of the human foreskin, which are still known as Tyson's glands. "It is a curious reflection," writes his biographer, "not without a certain moral, that in the world of medicine, to which he made so many highly important and original contributions, Tyson should to-day be remembered alone by the least important of his discoveries." Of his numerous contributions to knowledge, Prof. Ashley Montagu places the monograph published in 1699, when Tyson was in his fiftieth year, far above all the others; its full title runs thus: "Orang-Outang, sive Homo Sylvestris: or, The Anatomy of a Pygmy; Compared with that of a Monkey, an Ape, and a Man. To which is added, A Philological Essay, Concerning the Pygmies, the Cynocephali, the Satyrs, and Sphinges of the Ancients. Wherein it will appear that they are all either Apes or Monkeys, and not Men, as formerly pretended." The biographer gives a vivid account of how his attention was drawn to this monograph, and of how he was drawn into writing a Life of its author. In 1923, when Ashley Montagu was a free-lance student in London, and when the reviewer had the pleasure of meeting him frequently in the museum of the Royal College of Surgeons, he (A. M.) came across, in a work written by Dr. Duckworth, now Master of Jesus College, Cambridge, the following passage: "It constitutes a most remarkable anticipation of modern methods of research, and still serves as a model for investigations into the structure of Man and Apes." On reading this passage Ashley Montagu was moved to ask: "What kind of man could this have been who was responsible for so remarkable a work?" He resolved "at some leisureed time to make his more intimate acquaintance." To his surprise he found there was no biography of Tyson, so he "resolved to put Tyson together" for himself. He set to work on Tyson in 1936; thanks to the enlightened liberality of the American Philosophical Society, he was given opportunities of examining with his own eyes all Tysonian material available in the United States, and to visit England, on the eve of war, and examine documents preserved in Bristol, and those to be found in the archives of the Royal Society and in the Royal College of Physicians of London. Out of these gatherings Tyson has been brought back to life.

A. K.

### INFORMATION ABOUT CANCER

Ever since the British Empire Cancer Campaign was founded one of its most important duties has been from time to time to review new suggestions about the cause and treatment of cancer. In the past the conclusions arrived at have not always reached the medical profession. To-day it is more than ever important that medical men should be able to obtain authoritative information on suggested remedies and theories of causation. The Campaign, therefore, will be willing to communicate its opinion on any new form of treatment on which it has information. It will continue to investigate methods of treatment and theories of causation, and is willing to undertake or to promote research into such subjects, provided the following conditions are fulfilled:

1. That in the opinion of the appropriate expert committee of the Campaign such a subject offers any prospect of advancing the solution of the cancer problem.
2. That the fact that a theory or suggested treatment is being investigated by the British Empire Cancer Campaign shall only be disclosed with the consent of the Campaign.
3. That the Campaign reserves to itself the right to publish, in an appropriate manner, the conclusions reached, whether favourable or otherwise.
4. That in the case of theories concerning causation all available information shall be furnished by the advocate of the theory on the scientific basis and the experimental data, which shall be so detailed that exact repetition of the experiments can be carried out by experts in the field of research concerned.
5. That in the case of methods of treatment the precise nature, composition, and method of administration of the suggested remedy shall be disclosed, and that the evidence shall be collected in accordance with the safeguards as to scientific accuracy which experience has shown to be essential—namely: (a) That cases shall be of proved cancer, in so far as proof is practicable, preferably by histological examination. For choice, they should be cases affecting so-called "accessible" organs—e.g., skin, breast, cervix uteri, and mouth. (b) That every case treated shall be recorded whether the result is

favourable or otherwise. (c) That the clinical records, including follow-up, shall be as full as possible.

6. That in the case of a treatment based on experiments the Campaign reserves to itself the right to confirm the results of such experiments before attempting clinical trials of the remedy.

The Campaign will be happy to arrange for medical men to discuss their hypotheses and experiences with appropriate experts in the field concerned. Its address is 11, Grosvenor Crescent, S.W.1.

### DEFERMENT OF RECRUITMENT OF LABORATORY ASSISTANTS

The attention of pathologists is drawn to the fact that, under the special block procedure arranged with the Ministry of Labour by the Medical Research Council, skilled laboratory assistants are granted deferment on the ground that they are indispensable in the particular posts held: deferment therefore automatically ceases if they change their employers (but not if they are merely moved from one post to another within a single service).

If it is desired to appoint a pathological laboratory assistant who has been granted deferment in respect of another post, the prospective employer should ascertain from the Medical Research Council, before the change is made, whether deferment could be continued: if the transfer is thus approved, then the Ministry of Labour will be asked by the Council to take the necessary action. As a general rule a second transfer in respect of the same man cannot be approved within a short period. (Deferred laboratory assistants whose employers are in a position to release them for transfer may be recruited in their occupational capacity if urgent demands from the Services have to be met.)

## Reports of Societies

### A CANADIAN NEUROLOGICAL HOSPITAL CLINICAL EXPERIENCES BY MEMBERS OF THE STAFF

At the meeting of the Section of Neurology of the Royal Society of Medicine on Jan. 6 members of the staff of the Canadian Neurological Hospital in England recounted some of their clinical experiences.

Lieut.-Col. J. C. RICHARDSON explained that the development of the hospital and of the neurological services of the Canadian Army had taken place in response to needs not foreseen when the hospital was first opened in 1940 with 200 beds for the treatment of head injuries. The hospital had expanded steadily, and by July, 1943, reached its present establishment of 600 beds. Of this number 150 were devoted to a plastic surgery unit and 250 to the neuropsychiatric division on which his remarks were based. During the first year most of the consultant and advisory work was done from the hospital itself; afterwards a consultation centre was established in London, and later still a number of specialists, after spending three months in the neurological hospital, were sent to field medical units and general hospitals, and one physician from each general hospital was attached to the division for from one to three months, so that the medical staff was constantly changing.

The vast majority of the patients were Canadian soldiers, but a considerable number were Canadian airmen, and there were a few civilians and British Service cases. Mild or severe mental disorder comprised 70% of the cases, neurological disorder without permanent mental disturbance 19%, and general medical disorders 8%. This analysis was based on discharges rather than on admissions. The largest group (1,625 out of a total of 4,426 cases in the course of three years) comprised psychoneuroses, about half of this number being anxiety states. Cases of psychopathic personality numbered 646, psychosis 507 (chiefly schizophrenia, with 355 cases), and mental defect 304. Of the cases of neurological disease (828) the largest number (275) were cases of epilepsy, and the next most numerous neurosyphilis (117).

### Organization of the Division

The local organization and methods of the hospital unit had developed as seemed to be required by the nature and number of the cases. Until recently the neurosis cases and the organic neurological cases had been mixed together, and although the

cases of psychosis were segregated the organization proved to be unsatisfactory for investigation and disposal; it also hampered treatment and was not wholly satisfactory for teaching. When in 1943 facilities became available the division was reorganized. The seven wards of the division were allotted to three units. The two closed wards for psychotics and psychopaths remained segregated; two wards were allotted to the neurological unit and three to the neurosis unit. This last unit was the most important from the practical military standpoint, from 55 to 60% of the cases being returned to duty. The cases were admitted to the first ward, which was for the clinical and laboratory investigations and the separation of chronic neurotics. They were then transferred to the second ward, which was for treatment, and finally they were sent to the third ward for training or rehabilitation, where they were handled as soldiers rather than as patients. From this they were discharged to duty—to the field or the base—or sent back to Canada. A rotation scheme was devised so far as the staff were concerned, so that the medical officers gained experience of all kinds of cases.

The experience of the hospital was that neurology, psychiatry, and neurosurgery, planned as different components of one broad field of medical practice, offered the advantage of co-operative handling from the point of view of clinical investigation, diagnosis, treatment, and postgraduate training, and helped to break down the artificial barrier between the neurologist and the psychiatrist. Neuropsychiatry had been called upon to play a far larger part in the selection of troops and allocation of personnel, including choice of candidates for commissions, than was originally anticipated, and it seemed likely that the experience of this military neuropsychiatric division would be of lasting value in planning improvements in teaching hospitals and in directing attention to the psychiatric aspects of somatic illness.

Brig. GEORGE RUDDOCH said that this experiment, carried out under Canadian leadership, would have an immense influence on planning in the future. The term which best described the hospital was "common sense." Air Commodore C. P. SYMONDS added some appreciative comments, and said that in the R.A.F. the proportion of organic nervous diseases to the psychoneuroses was about the same as that mentioned by Col. Richardson. Sir HENRY TIDY spoke in praise of the liaison between neurology and psychiatry which existed at this hospital, and added that it would be to the mutual advantage of psychiatry and general medicine if they were as closely in touch. A New Zealand medical officer commented upon the small proportion of cases of migraine (only 26 cases out of the 828 listed as neurological diseases), and also upon the rarity of malingering. Col. Richardson had said that only three patients were classed as malingers, and in one of these the classification proved afterwards to have been mistaken.

The remainder of the meeting was given over to short papers by members of the staff of the hospital. Major W. S. KEITH gave a report of two cases of staphylococcal infection in which the patients suffered a severe paraplegia about six years afterwards owing to spinal extradural scars. Major B. C. EAGLESHAM brought forward a neuroradiological exhibit. Major A. W. STEWART described some contrecoup lesions in relatively severe cranio-cerebral injuries. In each case the local injury was a moderately well demarcated wound.

Major J. A. WALTERS spoke on some aspects of the treatment of Parkinsonism, basing his remarks on a clinical study in the out-patient department of a voluntary hospital in Toronto. The influence of mind over matter was illustrated in these cases, which showed how the total integration of the many elements in the life of the human being must be kept in mind. It was found that the health and vigour of 44 out of the 47 patients were being reduced by circumstances which could be identified from clinical history and examination. Another finding was that the post-encephalitic group lost their personalities to a certain extent, while the paralysis agitans cases preserved theirs to a far greater degree. The Parkinsonian signs and symptoms were observed to vary in some cases with the patient's psychological state, while in others they appeared to be unaffected. Specific psychotherapy was valuable in most cases; simple explanation, encouragement, and reassurance called for the physician who knew what was wrong and could gain the confidence of his patients, and most of these patients could

be managed by the family doctor better than by the hospital or consultant.

An association known as the British Association of Otolaryngologists has been formed. The officers are: President, W. M. Mollison; Vice-President, L. Colledge; Hon. Treasurer, V. E. Negus; Hon. Secretary, F. C. Ormerod. The temporary address of the Association is 22, Upper Wimpole Street, London, W.1. Tel.: Welbeck 4017.

The following officers of the Joint Tuberculosis Council have been elected for 1944: Chairman, Dr. James Watt; Vice-Chairmen, Drs. A. P. Sutherland and N. Tattersall; Honorary Treasurer, Dr. A. P. Foid (in succession to Dr. G. Jessel); Honorary Auditor, Dr. D. P. Sutherland; Honorary Secretary, Dr. Norman J. England (in succession to Dr. J. B. McDougall). The next meeting of the Council will take place in London on Feb. 19.

## Correspondence

### Infant Mortality in Scotland

Str.—The long-awaited report on infant mortality in Scotland is a disappointing document. Throughout its 85 pages there are but few new facts or ideas. And there was so much new material to be considered, such as the whole impact of the war on diet, housing, and employment, and the great number of overseas experiments and ideas which needed to be translated into Scottish terms. Sir John Boyd Orr's committee has missed a great opportunity. The measure of the manner in which the committee has limited its field is contained in the phrase on page 3: "The committee has confined its attention to pre-war conditions, except in the discussion of stillbirths." This is a most extraordinary statement when one considers not only recent advances in the United States, New Zealand, and Australia, but more so when one considers the impact of evacuation, war feeding, the practical temporary abolition of poverty, and the shortage of fuel—all environmental factors of some importance. There is scarcely a phrase in the whole report to indicate that these issues have been considered.

Even in the field that is covered there are some curious statistical errors. On page 8, for example, South Africa is credited with an infant death rate of 58. This figure applies to the white population only, and not to South Africa generally. Again, on page 30 reference is made to Table 20 on the previous page, but table and text by no means agree. The text also goes on to say that statistics relating to the percentage of the insured population unemployed in English cities are not available. My impression is that they are available in the Ministry of Labour Unemployment Index for the years required (1934-9). Another astonishing statement, on page 61, is that "the rich both in England and Scotland have infantile mortality rates approaching the limit of what is attainable with present knowledge of how to control environment." Considering that the English rate for "the rich"—i.e., Class I on page 16—is 33 per 1,000, and the rate for Scotland demonstrably higher, it is obvious that these figures will have to be halved before they approach the Dutch or New Zealand figures for comparable classes. No mention is made in the report of the extremely low infant death rates in Connecticut, Oregon, or even Minnesota.

The bibliography also shows significant gaps. There is no mention of any Dutch publications or of the work of K. D. Blackfan, C. P. Yaglou, or K. McKenzie, whose research work in the United States surely deserves some notice. Again, no mention is made of the *American Journal of Diseases of Children*, or of the Beveridge report, which has a useful commentary on environmental conditions.

These errors and omissions could perhaps have been overlooked if the committee had shown a little initiative, but it is only too apparent that the nutritional blinkers of the chairman have covered the viewpoint of the entire committee. Over a third of the report deals with pre-war nutrition, and some passages, such as Tables 60 and 61, appear to have been dragged in at the last moment without any attempt to analyse them, or to show in what way breeding experiments in rats may help to reduce infant mortality in Scotland.



The committee's main conclusions are that prematurity and "congenital debility" are mainly responsible for the excessive mortality of the first month, and that infectious diseases, which in turn are due to "poverty, faulty feeding, and poor housing," are the main cause of the high death rate between the first and twelfth months. Two-thirds of the stillbirths are due "to poor physique and poor health of mothers." Prematurity is "the most frequent single cause of death in the first month," but there is no mention of the extensive research carried out in this connexion by the Infants Hospital, Boston, Mass., which showed that in temperatures of 77°, and even higher, and with relative humidities of about 65%, the mortality of premature infants was reduced from 29% to 0.7%. The committee recognizes the importance of providing energy for mother and infant by proper diet, but it does not recognize that it is equally important that there should not be undue loss of energy through too cold an environment. At the moment of birth the infant passes from 99° to 50° or even 40° F. The shock of such a change to a grown man is severe enough, but to an infant it may well be the fundamental cause of death through this, that, or the other disease in a few days. For premature and, indeed, most newly born infants better chances of life are created by maintaining a uniform environmental temperature of 72° and even slightly higher.

Regarding environmental conditions generally, there is not a helpful suggestion in the report. Indeed the committee takes the view that "if climate has any important effect on infantile mortality... it is more than offset by other influences." This is an incredible statement when one remembers that the mortality in winter is *twice as high* as that in the summer. Scotland is on the average 5° colder than Southern England, yet, as Sir William Beveridge brought out in his report, the average Scottish household of 3 to 5 persons spends 13% less on coal, gas, or electricity (Table VIII). It is considered heroic and economical to be Spartan in Scotland, which is hard on the pregnant or nursing mother, and doubly hard on the infant. The committee admits (page 63) that clinics are often "ill lighted, badly ventilated, and dingy; insufficiently heated, cramped, and without facilities for lectures and demonstrations." But the report makes no recommendation that would remedy these faults.

It is particularly to be regretted that the committee has not considered in detail the statistics or environmental conditions of 1940-1-2 and even 1943, for in those years there was singularly little unemployment or poverty in Scotland, and diets have been "Wooltonized" to a degree; but the infant death rates are still excessively high, that for 1941 being 83 per 1,000 and that for 1942 69 per 1,000, both of which are higher than the 1939 rate. The English figures for the same two years are 59 and 49, the latter being the lowest on record, in spite of housing difficulties of an unprecedented degree.

The committee has skimmed its job. The Secretary of State for Scotland would do well to appoint a new Commission or committee to consider infant mortality problems in Scotland in an angle other than that of nutrition, and he would do extremely well if he instructed the new committee to consider at first hand recent developments and investigations in the U.S.A., New Zealand, Australia, and even Hertfordshire. —I am, etc.,

S. F. MARKHAM, M.P.

### Sciatica

SIR.—Anyone who reads in succession Mr. Harry Platt's interesting historical survey of the orthopaedic approach to the aetiology and treatment of sciatica, Mr. Ross-Smith's conclusions from an experience of 7,000 cases, and Dr. Cyriax's statement of his views as a pioneer in physiotherapy will find himself in such a fog of fact and fantasy that the need for debunking will appear more necessary than ever. Dr. Cyriax gives a list of the many "common lesions setting up unilateral sciatica," each with its appropriate treatment. Excluding "functional pain," which he cannot seriously regard as a "lesion," they are almost all hypothetical, having no actually observed pathological basis. What is "non-frictional sciatic periradiculitis"? What evidence is there that unilateral sciatic neuritis ever results from "poisoning with a heavy metal or

alcohols"? What is the clinical difference between gluteal myositis and gluteal fibrositis, and is there any evidence that actual inflammation of muscle or fascia exists in these conditions? If it did, would not deep massage be the worst possible treatment?

Mr. Ross-Smith appears to think that I regard sciatica as purely hysterical in origin. I don't. I believe that almost all cases have a physical basis at the onset, though this is often trivial and generally disappears rapidly with treatment by rest alone. There is, however, a great risk that the pain will be perpetuated as a hysterical symptom as a result of associated psychological causes. This can be prevented if treatment by rest is accompanied and followed by simple psychotherapy in the form of explanation, persuasion, and re-education (now commonly called rehabilitation), without resort to suggestion, whether conscious or unconscious, in the form of some kind of "specific" treatment.

It is not surprising that Mr. Ross-Smith has a poor opinion of psychotherapy in view of his belief that the first step in such treatment is to tell the patient that his pain is imaginary. He regards the diagnosis of hysteria as "absurd and unkind," although it entails a certainty of rapid cure. It is of course both absurd and unkind if hysteria is regarded, as Mr. Ross-Smith apparently regards it, as synonymous with malingering. Like Mr. Ross-Smith, I have seen epidural injections of novocain give relief, but whereas he is sure its effect is not psychological, I am equally sure that it is. William Evans, who invented the treatment, found that normal saline solution was as effective as novocain, and I soon found that epidural injection had no advantage over the older treatment by injection in the neighbourhood of the nerve trunk. Such methods of gross suggestion do no harm; but this is not the case with the "elimination of remote focal sepsis," which Mr. Ross-Smith advocates, for the wholesale extraction of septic teeth often does irreparable damage, and there is not the slightest evidence that focal sepsis is ever a factor in the pathogenesis of sciatica. It is astonishing that Mr. Ross-Smith recognizes disk compression as the cause of pain in only 2% of cases, whereas all neurosurgeons and most orthopaedic surgeons and neurologists would put the figure at 20% at least and probably much higher.

Finally I should like to draw attention to the important investigations of Major F. A. Elliott published in the *Lancet* since the appearance of my paper. He has shown that a prolapsed disk may give rise to myalgic areas in muscles supplied by the compressed roots which are indistinguishable from those caused by so-called fibrositis both clinically and in their response to procaine injections. It seems likely, therefore, that some of the cases of sciatica hitherto regarded as of fibrositic origin are really caused by disk pressure. —I am, etc.,

Oxford.

ARTHUR HURST.

P.S.—The above letter was written before the appearance of the *Journal* of Jan. 22, in which Mr. Blundell Bankart gives good reasons for disagreeing with the views on the aetiology of sciatica expressed by Prof. Harry Platt, Mr. Ross-Smith, and Dr. Cyriax, but no good reason for accepting spinal arthritis as the most common cause. Dr. George Macdonald ascribes his successful treatment by manipulation to his superior technique, though I expect it is more the unconscious suggestion which accompanies it than the actual manipulation which is the secret of his success. Dr. C. H. C. Dalton's views on treatment are much the same as mine, except that he treats the hysterical sequel of the primary lesion by short-wave suggestion instead of a more rational, though not necessarily more successful, form of psychotherapy. He wisely emphasizes the fact that the exertion of travelling to the treatment room more than outweighs the beneficial effect of any form of physiotherapy in the acute stage of sciatica.

A. H.

SIR.—From the correspondence on this subject it transpires that many favour the thesis that at least a majority of cases of sciatica originate through some form of oedema or fibrosis around the lumbosacral nerve roots. For several years I have been injecting small doses of local anaesthetic into the foramina, where acute tenderness is produced by deep pressure

in the foramina by means of a probe. A match-stick does excellently, and leaves behind it a small pink spot into which the hypodermic needle is inserted to a distance of one inch or so. Up to 800 cases have been treated thus with really satisfactory results. This treatment is always reinforced by forcible active exercises, thereby avoiding, in nearly every case, passive manipulations. Furthermore, determined patients who persevere with the exercises for the rest of their lives do not suffer from recurrences. My own is a case in point.—I am, etc.,

Reading.

A. H. PRICE.

### Suggestion

SIR.—Thought and belief have much in common, but there is a distinction between them though the words are often used as synonyms. "I think" or "I believe so-and-so" is just a matter of taste in words. There is a close correlation in many ways, but they are not the same. If I believe a thing, I must think it true, but the converse is not necessarily the case. Tertullian declared that he believed because it was impossible. He was speaking with the religious insight vouchsafed only to the ecstatic. Few can travel with him there, but it is not so difficult to have a notion of what he meant. Thought is probably a function of the cerebrum, though where therein, if anywhere, it is localized is a matter of surmise. Belief, in a way not understood, is probably diffused throughout the cells of a living organism. We can hold a belief in our bones.

Suggestion is a matter of belief and not thought. We cannot add to our stature by taking thought, but much can be done by faith. In Biblical times pathology was different from nowadays. Disease was attributed partly to demonic possession. Those able to expel the demon would cure the illness. Three things were necessary: (1) a belief in this view of disease; (2) a belief by the exorciser in his power; and (3) a belief in him by the sufferer. There is no need to consider any miraculous intervention, though this may have been the explanation. Many apparently parallel cases exist. The aboriginal black in Australia attributes disease to the presence of a foreign body within him, not unlike a demon. The all-powerful and much-respected medicine man treats him by means of a ritual dance, appropriate incantations, and the removal of a foreign body—a piece of crystal. He has brought the crystal in the equivalent of his waistcoat pocket. But there is reason to believe that no fraud is practised. The primitive black with his acute powers of perception knows that the crystal has been brought by the medicine man. It is a symbol of the indwelling evil, and this has been extirpated by the appropriate rites. Once again the same three principles are operative. Wides is their application. Suggestion is the name given to the process, but little else that is helpful is forthcoming.

Often almost contemptuous is its dismissal as "only suggestion" by those thinking of the complicated dexterity required by a modern major operation. The apotheosis of the barber has gone too far. Hair-cutting and blood-letting is too limited a field, and there can be no question of the miscellaneous virtues of the modern surgeon, but abetted by the marvels of the anaesthetist he has tried to do too much. Suggestion, so contemptuously dismissed at the front door, has come in through the window. The scene is familiar though the setting is different. The ritual of an operating theatre replaces that of the medicine man. Maybe a gastro-enterostomy is to be performed for a duodenal ulcer without pyloric obstruction. After a tedious convalescence a full recovery is made, and perhaps for many years the patient is free from all symptoms. He is confident that he has been cured. How has this come about? The theory on which the operation is based is completely irrational, but both the surgeon and the patient believe otherwise. This operation has latterly lost much of its popularity, but there are many to compensate for this. A favourite now, to judge from recent correspondence in the *Journal*, is an attack upon the lower vertebral cartilages in cases of sciatica: quite a considerable procedure.

Turning to the physician's side of the healing art, something of the same kind of thing is found. Autohaemotherapy for, say, recurrent urticaria is a good example. A stutter of theory, a grandiloquent name, a remarkable procedure, and the mantle of Aesculapius, perhaps in the shape of a white coat,

are not to be withstood. It can rarely occur to the patient that his doctor does not know what he is doing. The same absence of rationality characterizes another and very modern form of treatment. Shock or convulsive therapy is its name. First used for mental disorders, it is now employed for a variety of nervous illnesses. "Shake the bottle" we stick on to some of our mixtures. At least we know what we are shaking. The exponent of shock treatment makes no such claim. Much electrical equipment is often visible and that may be a clue to its success. Psycho-analysis is another example. From a mass of recondite pornography the valuable conception of the unconscious mind must be separated. Loud are the protests that suggestion plays no part in the curative processes—too loud, I think, and the unwarranted assumption is made that what has been laboriously disinterred from the unconscious will cease to operate adversely when it has become conscious. A long course of treatment is involved, and the surrogate of the medicine man has plenty of scope for his talents, not to mention the time given to the *vis medicatrix naturae*.

All these forms of treatment claim that they cure their patients. Perhaps they do. But others make the same claim, and if one relies on the same kind of evidence they also probably do. The list is a long one. It includes Christian Science, faith healing, chiropraxis, osteopathy, homeopathy, patent medicines, and many others. Their diversity suggests that the factor already considered is operative. If suggestion is so powerful should not an attempt be made to control its protean guises? With so much talk of preventive medicine current it is a melancholy reflection that one cause of death is very rare—so rare in fact that its acceptability to the Registrar-General is doubtful. Yet there is much to be said for it, and it is what we should like all our patients to die from with the "inevitability of gradualness" in the plenitude of their days: death from old age.—I am, etc.,

London, S.W.1.

E. GALLOP.

### War in the Nursery

SIR.—The anonymous article under this title (Jan. 8, p. 50) was a curious one. It seemed designed to make the flesh creep, and caused one to wonder how so many survive this ordeal of battle which is said to attend the beginnings of human existence, and succeed in developing into comparatively normal beings. It may be, however, that there were half-truths, exaggerations, and omissions in the descriptions, whose object apparently was to cast suspicion on the usefulness and desirability of children's nurseries.

Only a vague reference was made to mother-substitutes, who, in the persons of child-nurses and "nannies," have taken a large part of the mother's place in many well-appointed homes. There was a complete omission also to take into account the psychological effect on both mother and child of an overworked and tired-out woman struggling throughout the twenty-four hours with a young family, with no domestic help, and with cooking, washing, etc., to do. It is conceivable that a qualified member of a nursery staff, loving habits and adopting by choice a difficult and not-too-well-remunerated vocation, may make an effective temporary mother-substitute, and be able to win the co-operation of the child in all that concerns its welfare. It is also true, and nurseries are not unhappy places but the reverse, where the conditions are what they can and should be.

We must hope that mothers of young children will not be employed in post-war industry. It is certainly desirable that the mother should have the nurture and welfare of the child in her care. But experience shows that occasional breaks are good for both mother and child, and that they increase rather than decrease the sense of parental responsibility. It is permissible to hope, therefore, that our war nurseries will be transformed into extensions of child welfare service, to be available for a few hours' rest, for cases of illness in the home, a new confinement, or any other domestic disturbance, which at present bring anxiety to the mother and, it may be, unavoidable neglect of the child.

The reflections on the war situation in this article were also surprising. It is a far-fetched assumption that infants are aware of and directly affected by "the destructive impulses let loose in war," and that these "may serve to fan the flame of

aggression natural to the nursery age . . . provoking further fear and reactive resistance to a world so dangerous."

Psychological theorizations must be balanced and be seasoned with common sense and a sense of humour if they are to be helpful to those engaged in public or personal service.—I am, etc.,

London, S.W.1.

T. DRUMMOND SHIELS.

SIR.—Your recent annotation on war in the nursery (Jan. 8, p. 50) makes me wonder if your criticisms are quite fair to the wartime nurseries. I feel that the best type of nursery education is desirable for the great majority of children, and that there is a real danger to the whole nursery movement in substituting the wartime nursery and the nursery class for the fully equipped, properly housed, and adequately staffed nursery school. I wonder if the writer realizes the difficulties that beset the wartime nursery from the outset? Only one fully trained teacher is allowed for a group of nurseries, and the actual work among the children is carried out largely by probationers wholly untrained, or by girls who have taken the Child Care Reserve Course of three weeks' duration, for a trained deputy is not always allowed. Obviously the selection of probationers is of paramount importance, but the Ministry of Labour may not view this in the same light as the teacher. Skilled help is essential if the potential scenes your article so deplores are to be avoided, and the teacher has to train her helpers *pari passu* with their employment in the great majority of cases.

The second great difficulty in the wartime nursery is equipment. Admirable domestic equipment is provided, and the children can be comfortably seated, fed, and rested without difficulty, but these manœuvres occupy only a fraction of the nursery day. A sum of £15 is allowed for the provision of all play material for forty children, and recently a replacement allowance of 2s. 6d. per head has been granted! The teacher has to beg, wangle, or buy her own material if she wants her nursery to have a chance of success. The work of the Fire Service and of other voluntary bodies has been a great help to these nurseries. Is it fair in the midst of all this to compare these nurseries with well-equipped, skilfully staffed nurseries and expect comparable results in every case? A high incidence of unhappiness is never a necessary accompaniment of any nursery that has the children's activities adequately provided for.

The position of the under 5's in the elementary school is often much more unsatisfactory than that of the nursery child. Children may be admitted to these nursery classes from the age of 3 onwards, and often no special nursery technique or material is available for them. The classes are often overcrowded and understaffed, and the harassed teacher may have as many as fifty children without a helper. How can she possibly put any of her nursery principles into practice? She must rely on old formal measures to avoid chaos. Now the teacher is expected to add to her other duties the giving of vitamin supplements and iron tablets, which the children certainly should have.

That there are unsatisfactory nurseries is no doubt true, is it altogether surprising in the face of these difficulties? That there can be successful nurseries is equally true, as I know from my own experience, but in these the children's needs are all catered for, and this means, above all, skilled help.—I am, etc.,

Scarborough.

ELIZABETH R. CAMERON.

#### Effect of Pregnancy and Parturition on Pulmonary Tuberculosis

SIR.—Dr. R. S. McDade's letter (Jan. 15, p. 98) regarding my paper on this subject raises points which I do not think would have arisen had paper restrictions not precluded the publication of the summarized case records that I had prepared, and I am grateful to him for providing this opportunity of elucidating them.

I am not influenced by the fact that my conclusion that "active pulmonary disease is seldom accelerated by pregnancy and labour" conflicts with generally accepted beliefs, but I do wish to convince Dr. McDade (and possibly others) that this conclusion does not conflict with my own results. To this end may I be allowed to supply the following information?

While it is mainly true that only "treatable" cases are admitted to the E.C.C. Hospital, Black Notley, this is a generalization, not a rule, and no selection was exercised in respect of the pregnancy cases. Of the seven "progressive" cases which showed retrogression and to which Dr. McDade refers, three patients were admitted with hopeless extensive and bilateral disease. One other had extensive bronchopneumonic disease for which a pneumothorax was induced early in pregnancy, and a small focus appeared in the opposite lung 4 weeks after labour; 1 year and 9 months after labour both sides were quiescent. The remaining three patients had disease confined to one lung before labour and showed radiological increase after. One of these became quiescent 3 months later. Among the eighteen active cases which did not retrogress, nine had active bilateral disease on admission; seven improved and two were ultimately discharged quiescent. Nine had active unilateral disease; five improved and four were ultimately discharged quiescent.

I must in turn criticize Dr. McDade for citing percentage figures on seven out of twenty-five cases. In my paper I pointed out that 100 cases could only be taken as representative and are not statistically significant; he is not justified in comparing such small numbers of unselected pregnancy cases with the large numbers of "active," largely selected, non-pregnant cases which pass through our sanatorium wards.

Finally, lest he think that I would never advise termination of pregnancy in cases of pulmonary tuberculosis, I refer Dr. McDade to the penultimate sentence of my paper, in which I state that therapeutic abortion should be considered in certain cases of active disease.—I am, etc.,

E.C.C. Hospital, Black Notley.

R. C. COHEN,  
Deputy Medical Superintendent.

#### Cerebral Malaria

SIR.—In the article on cerebral malaria by Surg. Lieut. Sneddon (Dec. 25, p. 814) and in the letters by Major Cameron and Dr. Macleod (Jan. 22, p. 128) I am surprised no mention is made of mepacrine, and only in Dr. Macleod's letter of plasmoquin. I write from the same extensive experience in Assam as Major Cameron had in Malaya, and would commend to those who are meeting malaria without much knowledge of its treatment the article by the late Prof. Warrington Yorke in the *Journal* of July 18, 1942 (p. 61). Personally I would put in importance the treatment with mepacrine before that with quinine; I also use plasmoquin towards the end of treatment because of its value in preventing relapses.—I am, etc.,

Poole.

W. B. MCQUEEN.

#### Treatment of Malaria

SIR.—The article on malaria in British troops in West Africa by Hughes and Bomford (*B.M.J.*, Jan. 15) must be of the greatest interest to all concerned in the treatment of malaria.

From experience in the Far East I found that many physicians did not fully appreciate the importance of keeping patients in hospital, or, in the case of private patients, under conditions approximating hospitalization in their own homes, for a minimum of 14 days. This period was adhered to by me in European, Eurasian, and Chinese patients.

Some Far East colleagues will no doubt remember the severe clinical types of subtertian malaria very prevalent in such areas of Hong Kong Island as Deep Water Bay and Repulse Bay, and in certain areas of the new territories of the mainland. The majority of such, especially in Europeans and Eurasians, were of a pernicious type and in the category of medical emergencies.

As a special investigation up to March, 1939, extensive use was made of atebryn (mepacrine) to the complete exclusion of quinine. Atebryn by the intramuscular route was the method of choice adopted in all pernicious attacks where vomiting was an invariable complication (0.3 g. intramuscularly at once, and repeated in 6 hours' time); a similar dosage during the following 24 hours, if necessary. Improvement soon occurred, and atebryn 0.1 g. t.i.d. was continued by mouth for a further period of 3 days. In two or three instances a total of 0.9 g. was given in 24 hours without any untoward effect. A very large number of cases were treated. The atebryn was then

supplied gratuitously by Bayer. In the article by Hughes and Bonford no reference is made to the use of mepacrine by the intramuscular route.

The alarming complications as quoted by various authors—vide R. Brierclyffe, "Malaria in Ceylon," *Lancet*, 1935, 2, 1078—were not encountered in any of the nationalities treated.

A clinical report to the Experimental Unit at Elberfeld (Kikuth) on the extensive use of atebirin in malaria has no doubt been destroyed in the ruins of that area.—I am, etc.,

WILLIAM I. GERRARD  
(Formerly of Hong Kong University).  
Kingseat, Aberdeen.

### Shock Therapy

SIR,—I have read with interest Dr. Winnicott's letter attacking electric convulsive therapy on "ethical" grounds. Some of the replies emphasize the danger of further subdividing psychiatry by useless controversies. May I be permitted to add a note on this subject based on impartial observation of various forms of treatment in a large neurological out-patient department?

I have been privileged in the course of my work to meet leading exponents of several schools of psychotherapy, including psycho-analysts trained in Vienna, and to see some of the excellent results they all obtain even under wartime conditions. None of them, so far as I know, holds the view expressed by Dr. Winnicott. So Dr. Winnicott is to be congratulated on expressing himself so candidly and clearly in order that others who think as he does—even if only in some degree—may be encouraged to voice their opinions and so ventilate a natural and widespread feeling of revulsion from electric convulsive therapy. This is specially prevalent among those who know it mainly by name (horrible enough), and have no practical acquaintance with its results. Others have seen it used in the wrong cases, or, again, have heard of histological findings in rabbits subjected to formidable test doses.

Since the advent at the West End Hospital for Nervous Diseases of an out-patient unit for electric convulsive therapy, under the direction of a psychiatrist of considerable experience in treatments of this type, there has emerged in our hospital a new field of success. In my personal experience depressed patients, formerly inaccessible to other forms of treatment, even if suitable for out-patient treatment at all, and not infrequently refusing the only safe recommendation (treatment in a mental hospital), dragged on or curtailed their miserable existence without hope of succour. What use was it to assure them that they would *probably* recover if only they could put up with it a few months longer? 5,000 people in this country commit suicide annually, a perhaps not inconsiderable proportion of these suffering from depressive illnesses. Can it be "unethical" to save a few of these lives?

Of the first 50 cases treated at this hospital, all without complications, 34% returned to normal on an average of four weekly treatments, and a further 36% greatly improved. In every case care was taken not to pursue the treatment if there were not early signs of improvement. It need hardly be emphasized that, as in other branches of medicine, proper selection of the cases combined with care and skill in administration is essential for the best results.—I am, etc.,

A. GREY CLARKE,  
Medical Registrar, West End Hospital for Nervous Diseases.

### Obstetric "Shock"

SIR.—Drs. Mills, Kidd, and Dowsett (Jan. 22, p. 129) are reviving the doubts expressed by the French obstetrician Marc Rivière, who gave the title "Existe-t-il un Choc Obstétrical?" to a paper published in *Rev. franç. Gynéc. Obstét.* in 1924. Having gone over the records of 24,800 births which had taken place at the Vienna University Clinic between 1921 and 1930, I took pains in a monograph on obstetric shock ("Geburtsschock," *Wien. klin. Wschr.*, 1930, 1562) to differentiate between shock-like conditions occurring shortly after delivery and "true obstetric shock." Shock-like conditions after delivery may be due to haemorrhage, embolism, eclamptic toxæmia, and obstetrical manipulations such as version, Credé's expression or manual removal of the placenta, reduction of inversion of the uterus, etc. True obstetric shock was described as a variety of surgical shock occurring from

one to three hours after delivery, and closely resembling secondary or wound shock in its symptoms and signs. It is only diagnosed after careful exclusion of the conditions mentioned, and is probably due to absorption of toxic substances (? histamine) from the placental site, producing changes in the distribution of circulating blood. It occurred once in just over 4,000 deliveries.

Drs. Mills, Kidd, and Dowsett are doubtless right in regarding a great proportion of shock-like conditions occurring after delivery as due to haemorrhage. Apart from these cases, however, every experienced obstetrician occasionally sees patients in whom the shock is quite out of proportion to the (personally observed) amount of blood loss. The fact that these cases of true obstetric shock respond to blood transfusion (or infusion of a 10% glucose solution) does not prove that their condition is caused by blood loss, for surgical shock, of which obstetric shock is but a variety, may occur with a very slight loss of blood and still respond well to blood transfusion.—I am, etc.,

Bedford

NICHOLAS ALDERS.

### Mastoiditis in Infants

SIR.—In answer to Dr. R. Palmerston Rundle's letter (Jan. 15, p. 93) I would suggest that if he were to open the mastoids post mortem of babies under 1 year old who are supposed to have died from gastro-enteritis his opinion that mastoiditis is rare would be reversed. He states he has not seen a case of acute mastoiditis among the children he treats. In my paper I was careful to point out that the physical signs of acute mastoiditis as seen in elder children do not occur. In order to diagnose the condition before death the physical signs enumerated in my paper must be recognized. It is possible that Dr. Rundle has failed to diagnose a condition which nevertheless was present.—I am, etc.,

Birkenhead

P. W. LEATHART.

### Actinomycosis with Lung and Liver Involvement

SIR.—Mr. Hubert Chitty (Jan. 22, p. 115) cites a case of recovery from actinomycosis of the liver, and says that he can find no report of a similar recovery. Personally I had a case which might reasonably be classed as a similar one, although many phases occurred in the history, and it began primarily in the right lung, infecting the liver, and lastly the structures in the right iliac fossa.

The patient was a fruiterer who had his own horse and cart and had to groom the former after delivering his wares. He developed a right basal pneumonia which resolved so slowly and incompletely that he was sent to Manchester Royal Infirmary for x-ray examination. I have no records of the actual findings, but they were to the effect that resolution was incomplete and there was evidence of fibrosis with bronchiectasis. A state of ill-health resulted for months, with partial incapacity and a lot of expectoration, which was not found to be caused by frank tuberculosis.

After some months of poor health the patient developed pain in the right hypochondrium—not severe but continuous, with slight increase of temperature. He was put to bed and expectant treatment resorted to. The pain, which had been high up in the abdomen, settled in the right iliac fossa, and there was marked tenderness over McBurney's point. He was forthwith sent to Manchester Royal Infirmary and operated on after a tentative diagnosis of subacute appendicitis. An abscess was opened, but it was impossible to remove the appendix, and the patient was eventually sent home with a small fistulous opening present.

The discharge dragged on, and eventually another collection of pus developed with brawny swelling above the original incision. He was again sent to hospital and again operated on. The whole of the contents of the caecal area were matted together with brawny, oedematous adhesions. On this occasion, however, the true nature of the complaint was recognized, sulphur-like granules being present in the evacuated pus. Eventually the patient was sent home, and large doses of pot. iod. recommended.

He was subsequently bed-ridden for over a year, numerous sinuses developing in the right groin, and even below Poupart's ligament. The right hip- and knee-joints were partially flexed for about two years in spite of massage and gentle manipulation, but as the numerous cloacæ in the lower abdomen healed and the pus became less in quantity, the patient was able to get about with the aid of a stick, and the flexion gradually improved, until to-day there is little evidence even of a limp, and the aid of a stick is unnecessary.

So far as one can observe the condition is completely cured, and as I saw the man only a few days ago looking the picture of health

there is little doubt that the cure is complete, for it is now at least ten years since the initial onset of symptoms. The original infection was either a primary basal actinomycotic lung infection or else a subdiaphragmatic liver abscess, which in course of time tracked down the right psoas sheath and ended in the caecal area before it burst in the right groin.—I am, etc.,

Stockport.

J. G. BENNETT, M.D.

### Toxic Reactions to Sodium Dehydrocholate

SIR.—Sodium dehydrocholate as a 20% solution for intravenous injection has been extensively used for determination of circulation time. It is perhaps the most popular method of measurement. It is described as one of the standard methods by almost all writers on the subject, and has been sufficiently long in use to be a recommended method in such standard works as Fishberg's *Heart Failure* (1940), Paul White's *Heart Disease* (1937), and Samson Wright's *Applied Physiology* (1940). I have found no reference in these works to toxic reactions, nor was there any mention of it in Martindale's *Extra Pharmacopoeia* (1941). The technique has been used freely in this clinic during the last three or four years as a measure of arm-to-tongue circulation in congestive failure, when it has proved a useful indication of progress under treatment, and also in the diagnosis on supposed communication between the right and left sides of the heart. Recently, however, using the standard preparation supplied by a firm whose standards of purity are very high, reactions have been experienced in three patients, and in one of these subsequent death was probably to be ascribed to the reaction. The symptoms were as follows.

No immediate effect beyond that desired—i.e., experience by the patient of a bitter taste—was produced, and the patient complained of nothing for about an hour. There was then a slight rigor followed by headache, nausea, actual vomiting in one case, and a feeling of severe malaise. No alteration in heart rate or rhythm or fall in blood pressure was observed in the two non-fatal cases; in one of these the reaction was only distinctly unpleasant, in the other slightly alarming. In the third case, however, there appeared to be an immediate "collapse," and the nurse who witnessed it could temporarily not feel the radial pulse. By the time the house-physician made his observations (10 to 20 minutes later) the heart rate and rhythm seemed undisturbed and blood pressure was 150/90, having previously been recorded as 170/110. The patient was still distressed, however, with rather rapid respiration rate, and was spitting up a slightly frothy sputum, but not in any large quantities. The sputum was not blood-tinged. A few crepitations were heard at the bases, but these had been observed the day before when the patient had been admitted. An injection of nikethamide had been given at the onset of these symptoms, and oxygen. The patient was then left by the house-physician with no sense of great anxiety, but one hour later suffered again a sudden circulatory collapse and died in a few minutes. No consent for post-mortem could be obtained.

I am informed by the suppliers that occasional toxic reactions have been reported by other observers, and that some investigation is being made as to the cause, but that such reactions are "infinitely few in comparison with the number of ampoules used for estimation of the circulation time and other purposes." The proportion, however, which the reactions we have experienced here bear to the total number of times we have used sodium dehydrocholate, although small, is certainly not infinitely small. Despite the usefulness of the test, it seems inadvisable to use it so long as the possibility of such serious reactions exists. There are other methods which, although perhaps not quite so satisfactory for bedside use, can nevertheless take its place.—I am, etc.,

Inverness.

D. G. LEYS.

### The Septic Finger

SIR.—If I may be allowed a little of the valuable space in your correspondence column I would like to support Drs. Thomas, Mistlin, and Boroda (Jan. 15, p. 98) in their reply to Dr. Bailey's letter (Dec. 11, p. 764) in which he says that he saw only one "over-ripe" septic finger and no cases of necrosis of a terminal phalanx. He was extraordinarily lucky!

Dr. Romer was not wrong in stating in his letter (Oct. 30, p. 556) in reply to Dr. Atkinson's (Oct. 2, p. 432) that "the worst mistakes are not made by 'the most junior house-surgeons,'" as the latter seems to believe. True, as he (Dr. Atkinson) says, "there is much unskilful and even negligent treatment of septic fingers," but as to who is responsible for this I am in 100% agreement with all that Dr. Romer says in his excellent letter.

But since none of these writers has produced any actual figures, I have tabulated the more relevant facts from the first 70 consecutive record cards of the first 70 patients with infections of the hand that I saw and treated myself.

Type of Infection	Number and Percentage	Days Lost by All	Number "Over-ripe"	Average No. of Days for "Over-ripe"	Average No. of Days for Others	Average Difference
Superficial abscess	19 (27.14)	196	6	13.8	6.3	4.3
Paronychia	16 (22.85)	187	3	24.66	7.5	17.16
Pulp	14 (20)	154	2	26.0	8.5	17.5
Tendon sheath	7 (10)	164	2	45.0	14.8	30.2
Lumbrical canal	3 (4.28)	74	2	43.0	15.5	27.5
Septic arthritis	1 (1.42)	48	1	48.0	—	—
Miscellaneous	10 (14.28)	184	3	28.6	14.0	14.6

This table shows that in 70 infections of the hand 1,007 man-days' work were lost, in my opinion at least, 326 (approximately) being avoidable if the patients had been treated earlier with adequate drainage. Not only was there this loss of labour for war production, but in three of the cases which were "over-ripe" (19 in all—i.e., 27%) there was necrosis in a terminal phalanx, as shown by x-ray examination, while most of the remaining 16 have some permanent stiffness and loss of function. Eight of these unfortunate ones had had their fingers "lanced" by their doctors from 2 to 5 days before being sent up to hospital. Each had had a "freezing spray." Surely the ethyl chloride spray can have no place in the treatment of these infections, since they are either (1) so superficial that the dead skin can be snipped off quite painlessly without any anaesthetic, or (2) so deeply seated that this method of anaesthesia cannot enable adequate incisions to be made.

Finally, I would like to reiterate Dr. Romer's observation that "no doctor should go into general practice without having done a casualty job." Being only four weeks away from the end of my appointment as a casualty officer, I am quite convinced that for good all-round experience it is the best possible way of spending the six months before joining one of the Services.—I am, etc.,

London, N.15.

PHILIP HOPKINS.

### Psychiatry at the Cross-roads

SIR.—In view of the growing importance of psychiatry in all branches of medicine the profession should be grateful to Drs. Sargent and Horsley for drawing attention to some of the more unsatisfactory features of mental hospital administration. They mention particularly one question—namely, the inferior status of the "assistant medical officer." The name sums up the position. No official recognition is accorded him of his specialist qualifications. He is an A.M.O., not a psychiatrist. All progressive members of the profession now advocate that in all hospitals, including mental hospitals, the clinical worker should have a status at least equal to the administrator's (both doctors and nurses), and that the clinical affairs of the hospital should be run by a clinical committee.

Time was when in his custodial role the medical superintendent could effectively carry out the duties implied in both parts of his title. There is still a legal fiction that this is so even now. Such is clearly far from being the case, and it is absurd to suggest that any one man can in fact be fully *au fait* with all that is happening in a community which, including patients and staff, may total nearly 4,000 persons in some modern mental hospitals.

We must never lose sight of the old truism that as doctors our first duty is to our patients. Unfortunately it is very easy to do so, as a remark in Dr. Cuthbert's letter illustrates. As a solution of the present difficulties he suggests that the A.M.O. should resign or seek appointment elsewhere in a more progressive district if he meets with opposition. But what of the



unfortunate patient who is not at liberty to resign or seek appointment elsewhere?

The second main factor in the production of those undesirable internal stresses among the medical staffs of mental hospitals to which your correspondents refer is the isolation of these hospitals. The mental hospital is a self-contained world effectively insulated against the real world outside. This barrier must be broken down if psychiatry is to play its proper part in general medicine, education, and industry. All local mental services must be integrated into a national scheme with interchangeability of staffs. The mental service must function as a unit of a general health service on a national scale. Psychiatrists should work in health centres; general hospitals, schools, and factories, as well as in the mental hospital. The mental deficiency and general psychiatry personnel should no longer be rigidly separated, and the prison service should be linked up with the general scheme. Above all, in research, greater efforts must be made to enlist the general research worker with all his technical facilities in the attack on the host of formidable problems with which psychiatry bristles.

The difficulties of Drs. Sargent and Horsley will be solved when, by the breaking down of these barriers, we are enabled to take psychiatry to the patient instead of taking the incurable psychotic to the "A.M.O."—I am, etc.,

St. Mary Cray,

BRIAN H. KIRMAN.

### Intravenous Anaesthesia

SIR,—I have read with interest the article by Drs. F. W. Roberts and B. A. Sellick describing a simple method of intravenous anaesthesia (Dec. 25, p. 813). My interest in anaesthetics is purely from the surgeon's view-point. As the anaesthetics in this hospital are given by house-surgeons, many of whom have no previous experience, it is a matter of necessity for me to interest myself in this branch of medicine and to try to teach it as well as to perform operations (a task I do not approve of). I have been using intravenous anaesthesia since 1936, and I have now given, or rather have been responsible for having given, about 3,000 intravenous anaesthetics without any mortality or even any serious worry about any case.

I do not agree that the apparatus described by your correspondents is so very simple. In the first place it requires the use of a table, which if large probably comes in the way of the surgeon or his assistants, and if small must be of a very sturdy pattern to ensure that it is not knocked over accidentally. The provision of a hand bulb requires fairly frequent attention if one is to ensure that blood does not leak back from the vein and block the needle during the intervals between injection of the anaesthetic solution. I do not see anything cumbersome in a simple metal stand which provides a continuous gravity drip with such an apparatus as a colossal saline bottle with the usual attachment for intravenous drip. With this apparatus the anaesthetist can devote more of his attention to the patient, and the continuous drip eliminates all possibility of blood blocking the intravenous needle. Another point I would like to stress is the necessity for putting three strips of adhesive plaster on the patient's forearm: one across the tube immediately behind the adapter, a second about 3 in. further back, and a third about 1 or 2 in. further on. A thin pad of ribbon gauze under the outer end of the needle and the adapter will be useful in most patients, especially thinner subjects. I do not use pressure tubing as described by your correspondents in para. 6: about 4 in. of ordinary good tubing is quite good enough, and has the advantage that it permits the easy insertion of the needle, injecting the anaesthetic agent. It is also easy for the anaesthetist to compress this tubing on the distal side while injections are being given. For operations in the upper part of the body the vertical stand has the further advantage that it can be moved rapidly out of the way. I have never seen a needle slip out of the vein after the adhesive strips are applied properly to the tube and the patient's arm, and the colossal drip-saline apparatus is the essence of simplicity.

Intravenous anaesthesia does not appear to be very popular in this country, judging from the number of house-surgeons who come here and who have never seen it given. So far

as I can estimate this is due to failure to apply a proper technique, and especially pre-operative medication. For short operations of ten to twenty minutes' duration I do not think it has an equal. It has the great advantage of putting the patient asleep in one minute without any unpleasant feeling whatever on his or her part, and it provides muscular relaxation not usually possible with gas.

The highest dosage I have used has been 34 c.cm. of 5% pentothal. All patients receive a preliminary dose of morphine varying from 1/6 to 1/2 gr., with atropine, according to the stature of the patient. Patients who do not appear to be recovering fairly quickly receive a dose of intravenous coramine, which has proved a rapid restorative. The only unpleasant sequel is vomiting, which occurs in about one-fifth of the patients. The vomiting is not of a very serious character and in my opinion is very frequently due to morphine, as about 10% of all patients have a tendency to vomit before they receive any pentothal.

Finally, I am sure (as this important subject has been very seldom dealt with in the *Journal*) many of us would be glad to have some further information from expert anaesthetists such as Drs. Roberts and Sellick on the maximum dosage they employ in the administration of intravenous anaesthesia.—I am, etc.,

J. F. O'CONNOR,

Surgeon, Limerick County Hospital.

### Population Problems of India

SIR.—Prof. Blacklock has raised a very important topic in his article in arguing it will be necessary to give attention to the population problems of India. However, his essay is based on an uncompromising acceptance of the validity of the Malthusian doctrine, backed only by the rather hypothetical support of Henry George. But neither of these is to-day usually regarded as the greatest of economists or even of experts on population problems. On the contrary, Malthus, whom facts have nowhere proved correct, is regarded as a subject of purely historical interest.

As regards Western Europe there is no doubt of the falsity of his theories. In India, too, he has been disproved: Prof. Blacklock quotes the increase of the population 1931-41 as being 15%. Prof. R. R. Kuczynski, "the most distinguished living authority on problems of population," has thrown considerable doubt on the accuracy of the Indian census figures in the *Statist.*, Dec., 1937; but even if the figures are accepted, while India's population 1921-31 increased by 10.6% the U.S.A. increased by 14.2%. From 1880 to 1930 India's numbers rose by 31.7%, while England and Wales bore 53.8% more. Moreover, Indian food production increased by more than the population (R. Mukerjee, *Food Planning for Four Hundred Millions*, 1938, pp. 17 and 27). Prof. P. J. Thomas in the *Times* of Oct. 24, 1935, summed it up: "Population has not outstripped production. . . . Those who are alarmed about 'the devastating torrent of babies' in India will do well to direct their attention to improvements in the distribution of the national income, in the quality of consumption, and in the geographical distribution of population, and to other allied matters."

I would submit that there are many points of the greatest significance which are overlooked in Prof. Blacklock's thesis, and I beg to draw attention to some of them.

1. He omits all consideration of the possible effects of industrialization in India. While it might be correct in global estimations to concentrate all attention on agricultural products as the basis of human life, it is certainly wrong to do so in considering one country, even though it be as vast as India. Particularly is this a potentially great source of error in India, since she is richly endowed with many of the raw materials of industry, the development of which cannot be long delayed. Furthermore, as the Hot Springs Conference Report, Section II, states, "The real clue to the solution of the problems of agricultural over-population lies in industrialization. . . . [it] is also necessary if we are to raise the general standard of living."

2. New scientific agricultural techniques have demonstrated the enormous potentialities of increased production—the verbalization of grains enabling otherwise climatically unsuitable areas to produce food grains, artificial insemination with its

prospects of improved stock breeding, heating of soils by electric wiring—all these are the very first-fruits of the application of science to agriculture, and give promise of new and limitless production possibilities.

3. There is an observed tendency for urban populations to be less fertile than rural populations, so that as the industrialization which it is suggested in 1 may take place, it might be accompanied by a reduction in the birth rate.

4. Man is both consumer and producer. To-day in India 50% of all deaths are of children under 10. From another standpoint this means that a great proportion of the population never functions as fully efficient producers. Every lengthening of the span of life, if it is coupled with adequate nutritional intake, increases the producer period of a man's life.

5. As emphasized at the Hot Springs Conference, only a satisfactory diet will enable a man to function as an efficient producer, and, to quote once more from the admirable section reports of that conference: "Given the will, we have the power to build in every nation a people more fit, more vigorous, more competent; a people with longer, more productive lives, and with more physical and mental stamina than the world has ever known." It is on this goal of expansion, rather than on any restriction, whether of production or of population, that I suggest we should fix our gaze.—I am, etc.,

R. G. FORRESTER,

Chairman, Research Committee, Association of Scientific Workers.

### Allowances for Tuberculous Persons

SIR,—There has been some criticism of the scheme for tuberculosis allowances, the guiding principles of which were adumbrated in Ministry of Health Memorandum 266 T, a document that may yet prove to be the foundation of a "charter" for the tuberculous. Everywhere—from the House of Commons to the dispensary waiting-room—one learns of the shortcomings of a scheme which the Government is among the first to own is not comprehensive. Two main barrages of criticism have been laid down: (1) that the scheme excludes the "chronic" case; (2) that non-pulmonary cases are ignored.

Adult pulmonary tuberculosis is, in the main, a chronic, fluctuating disease. The most acute types may be fatal within weeks or months. Is it not therefore wrong, for the purposes of the treatment allowance, to make a distinction between "chronic" and "acute"? In the most severe types (than which no type is less "chronic") no tuberculosis officer would recommend payment of allowances. The criterion for participation is surely whether an individual, by undertaking treatment, has a reasonable prospect of being restored to working capacity within 1 to 2 years. Where the prognosis is less favourable many think that such patients should also receive benefit. This raises the larger issue of whether our chronic sick population in the future should be entitled to pensions from the State. It would be untimely and inequitable to grant pensions to our chronic phthisical population while leaving out our chronic neuritis, cardiacs, arthritics, etc. It cannot be said that mere provision of allowances to those suffering from chronic phthisis would alter by one jot their potential infectivity or others.

Non-pulmonary cases are generally not a danger to public health, and hence joint tuberculosis requires prolonged institutional treatment. For these and other reasons I do not think that they should be included in the present scheme. If they were, such diverse conditions as Pott's disease, renal and abdominal tuberculosis, lupus, iridocyclitis, would all carry some entitlement to benefit. Has the tuberculous synovium to be favoured while the "rheumatoid" one is not? Should we aid our *tubercle bacillus* and not our abdominal Hodgkin? There is no halo round the tubercle bacillus that it should be expected to receive such priority.

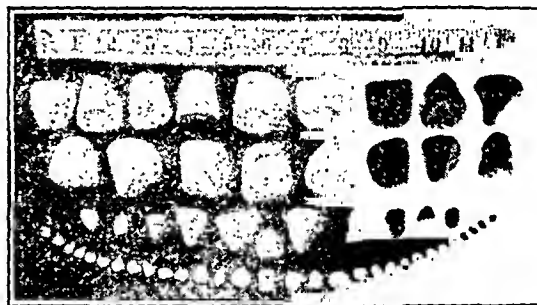
Mem. 266 T, essentially a wartime measure, is a beginning that is welcomed by all tuberculosis workers. Few are they who, if given a free hand, could not improve the scheme. No Government in the future can turn back on a road already travelled upon up to (and beyond) the first milestone. We can therefore expect with confidence that Mem. 266 T is the first instalment of a programme in which it will be recognized that our "chronic sick" population, including the chronic tuberculous, is the responsibility of the community.—I am, etc.,

HE

R. HARDY.

### 58 Stones in the Urinary Bladder

SIR,—In December last there was admitted to the Waveney Hospital, Ballymena, a man aged 67 who complained of pain and frequency of micturition with the frequent passing of what he called small flints. Of these he stated he had passed three on the day before admission. His trouble dated back for almost twenty years. On abdominal palpation a hard tumour the size of a foetal head could be felt rising out of his pelvis. X-ray examination showed an opaque mass of that size apparently faintly divided into separate masses about the size of bantams' eggs. On Dec. 29 I removed from his bladder, through a suprapubic approach, 58 stones weighing altogether



20½ oz. The largest was well over 1½ oz. in weight and there were 11 which weighed over 1 oz. each. I enclose a photograph of the stones, which shows their shape and size when compared with an inch tape measure included in the photograph.

This is a record number of bladder stones so far as I am concerned, and I have been wondering if it approaches a real record. The patient is doing well, and when after seeing the stones he had expressed his astonishment at their number he made one request. He stated that his family had thought that he had been exaggerating his sufferings before he was sent into hospital, so he specially asked that the stones should be shown to his wife, stating that surely after seeing them she would show a little more "generosity" towards him. I presented him with a copy of the photograph, which he shows to people presumably to stimulate their "generosity".—I am, etc.,

Ballymena, Co. Antrim.

J. ARMSTRONG.

### Artificial Vagina

SIR,—I have read the article by Mr. Thomas O'Neill on congenital absence of the vagina treated successfully by the Baldwin technique (Dec. 11, p. 746) with great interest. However, I have missed one publication among the references. It concerns an operation for atresia vaginae performed, and published in the *Arch. Gynäk.* in 1923, by G. A. Wagner, working in Prague at that time.

The case concerned a woman of 27 with atresia vaginae operated on at the age of 19 for haematocolpos and haematometra. On examination there was found a vagina which was divided into two parts by a transverse scar. The lower part was about ¾ in. long admitting the tip of the finger, the upper part was about 2 in. long and connected with the lower part by an opening just admitting a probe. The uterus was of normal size. After excision of the scar a piece of rectum was used to form an artificial vagina following Schubert's technique.

After the operation the patient menstruated regularly until the spring of 1922, when she became pregnant. Arrangements were made to perform a Caesarean section at term in order that the artificial vagina should not be damaged. As the patient lived in the country and the labour pain started a short time before the estimated date she was unable to get to hospital for the operation. However, a living child of 6 lb. was born with the aid of forceps and episiotomy. Apart from this episiotomy the artificial vagina was undamaged. The woman delivered another living child by natural means, but unfortunately I could not find the references for the second pregnancy.—I am, etc.,

London, N.W.1.

V. GOLD, M.D. Prague.

# Babies in Hospital

SIR.—I am in entire agreement with Dr. Margaret Dunstan in her opinion that "hospital wards can be very dangerous places in which to treat infants" (Jan. 22, p. 131). Out of a series of 190 cases of infantile diarrhoea treated at the West Middlesex Hospital between April, 1942, and April, 1943, 84 were transferred direct or recently discharged from institutions—maternity wards, children's wards, and wartime day nurseries. The total mortality was over 50%.—I am, etc.,

PATRIA GARDNER, M.D., M.R.C.P.  
Asst. M.O., Oxfordshire County Council

## Obituary

W. W. C. TOPLEY, M.D., F.R.C.P., F.R.S.

We much regret to record the sudden death on Jan. 21, at the age of 57, of Dr. W. W. C. Topley, a brilliant bacteriologist, a great administrator, and for more than twenty years an outstanding figure in English medicine. His career as a student was marked by conspicuous success. At Cambridge he was a scholar of St. John's College and was placed in the first class of the Natural Sciences Tripos. He qualified in 1909. While at St. Thomas's Hospital he won the Murchison Scholarship of the Royal College of Physicians, and, influenced perhaps by the vigorous personality of L. S. Dudgeon, as were others of his generation, he began his life's work as assistant director of the hospital laboratories. A year later

he became director of the department of clinical pathology and lecturer on bacteriology at Charing Cross Hospital, and from that time onwards became more and more engrossed in bacteriology. As a captain in the R.A.M.C. he was appointed bacteriologist to the British Sanitary Commission in Serbia, and in 1919, on his election to the Fellowship of the Royal College of Physicians, was invited to deliver the Goulstonian lecture, an unusual honour for a laboratory worker.

In 1922 Topley's reputation as a bacteriologist and as a teacher was recognized by his election at an early age to the

chair of bacteriology in the University of Manchester, where during the following five years his vigorous capacity for constructive administration found congenial and profitable opportunity. He planned and brought into existence an admirable course designed to give young graduates a sound training in the principles and practice of bacteriology, and it provided the model for the courses for the academic diploma in bacteriology of the University of London. In 1926 he delivered the Milroy lecture, and his election in 1927 to a professorship in the University of London and the directorship of the Division of Bacteriology and Immunology in the newly established London School of Hygiene and Tropical Medicine came as a fitting and very popular recognition of the position which he had made for himself among English-speaking bacteriologists. The appointment at the School of Hygiene provided Topley with a larger field for his gifts as a teacher and as an administrator, and enlarged opportunities for collaboration in research with his colleagues and pupils as well as with friends in other London laboratories.

In his original work he devoted himself to the investigation of the factors which influence the spread of bacterial infection, and he invented and used entirely new methods for the study of epidemics in a population of laboratory mice. He was one of the first to use experimental methods in the study of epidemics, and he became the authority on the subject. During

the twenty years 1919-39 Topley in association with colleagues and pupils carried out a number of ingeniously planned experiments which required skill and patience in their performance, and judgment in their interpretation. He made new observations and was able by the use of controlled experimental material to amplify and check conclusions derived from the observation of naturally occurring epidemics in man. His contributions to bacteriology derived their inspiration from the study of the problems which presented themselves to him in the course of his epidemiological inquiries. In 1921 he described an ingenious method of obtaining cultures from single bacterial cells, and in the same year published a paper on the interrelationship of members of the Salmonella group of bacteria. He contributed several papers on the complex problems arising from the antigenic analysis of the types responsible for enteric infections, and on the susceptibility of these micro-organisms to bacteriophage. The studies of experimental epidemics provided an opportunity for the investigation of the influence of prophylactic inoculation under controlled conditions, and of the effect of change of diet on a population of mice exposed to infective disease. Of particular interest is his more recent work undertaken in association with H. Raistrick and M. E. Delafield on the immunizing potency of antigenic components isolated in a state of relative chemical purity from *B. typhi murium* and from *B. typhosum*. In a short paper published with J. Wilson and J. T. Duncan it was shown that, in a mixture containing two distinct types of bacteria and their two homologous antisera, the resulting aggregates were of two distinct types, each containing individuals of one or the other species. Mixed aggregates did not occur.

Topley wrote well, and *An Outline of Immunity*, published in 1933, contained within 400 pages an informative review of the then state of knowledge in this subject. To-day it is still good reading. *The Principles of Bacteriology and Immunity*, which he wrote with G. S. Wilson, became on the day of its publication the standard work of reference in the English language, an indispensable source of accurate and up-to-date information. Topley's communications to the Pathological Society will be remembered by its members as examples of exposition, short and to the point, and often flavoured with a restrained and half-concealed humour.

Early in 1939, at the request of the Medical Research Council, Topley undertook the preparation of plans for the mobilization of bacteriological experience to meet the probable needs of impending war. He had a gift for making plans, and the rarer gift of making plans which worked and of choosing the right men to carry them out. The Emergency Health Laboratory Service, a fitting memorial to his bold but always constructive planning, should survive the period of the war to the great advantage of the medical services of the country. His election to be Secretary of the Agricultural Research Council—a remarkable tribute to his administrative genius—came as a shock to his medical colleagues, to whom his help and co-operation, always freely given, had come to mean so much. In 1942 he was awarded a Royal Medal of the Royal Society for his outstanding work on experimental epidemiology and immunology.

Staunch and loyal to his friends, in whose problems and difficulties he took an interest which was sometimes critical but always helpful, he disliked humbug, especially in high places, and was always ready to give encouragement and help to younger men who came to him for advice. We who have known him and enjoyed his companionship must mourn a much-loved friend, and medical science can ill afford his loss.

We are indebted to Prof. MAJOR GREENWOOD for the following appreciation: A friendship of more than twenty years and close scientific collaboration down to the outbreak of war united me to Topley. Of the merits of our work on experimental epidemiology it is not for me to speak, but a few words on the nature of the collaboration may be said. The whole credit of initiation belongs to Topley and all the improvements of experimental technique were his. The part of the statistical collaborators was mainly critical and technical; when, as sometimes happened, one of us suggested a new experiment, it was Topley who converted a project into a real experiment. His skill in devising a set-up was great; but others can speak of his scientific genius with more knowledge than I; it is of him as a human personality that I wish to say something. Bagehot said of Macaulay that he never changed, that what he was at 30 he still was at 50. Bagehot intended this to be disparaging—he spoke of Macaulay's inexperienced nature; the sense in which I apply it to Topley is not disparaging but, I think, the key to his success. He never lost the eagerness which he showed as a young man.

When Topley began his work on experimental epidemiology in 1919 he was under 35; his wartime experience of a great epidemic and the vagueness of "classical" epidemiology—a mixture of



(Elliott and Fry)

archaeology and folk-lore he once called it—stimulated him to try experimentation. Perhaps he may have expected quicker results from experiment combined with the new biostatistical technique of Pearson and his pupils than an older man would have done. If so, he quickly readjusted himself, and realized that the research would be long and could not be spectacular; that at first one could only verify natural experience; then, as the technique became more precise, make small additions to knowledge; never, within the span of a lifetime, solve completely the great problems. But his enthusiasm never flagged. He could bear cruel disappointments—the ruin of a long experiment by an accidentally introduced infection, or, still more exasperating, the demolition of an apparently established hypothesis by a “natural” variation—with perfect good humour. That is why he has left a technique which others whom the gods do not love can use. The hardest part of the research is over; now duller people can raise the flower for they have got the seed.

It may be said that Topley's enthusiasm was confined to a relatively narrow range of subjects, that his scientific philosophy was Victorian. Perhaps that is true; he read widely, but never, I think, had much emotional sympathy with methods of seeking truth which did not depend on controlled laboratory or field experiments. However, in these days of slovenly omniscience one may well respect a man who resolutely ignores what does not interest him, who never pretends to know what he does not know. We have lost a man whose intellectual honesty was unshakable, who always expressed his opinions clearly.

“... Let me not live  
Atter my flame lacks oil, to be the snuff  
Of younger spirits,”

is a prayer Topley would have put up; he has gone before the meanest spirit could hint at a lack of oil, and science will be the poorer. His friends will cherish more personal memories—his keen enjoyment of the sea and the open country; the solemnity with which he denounced idols of the market place; the twinkle in his eye when one asked: “A bad man, Bill?”; and he would reply: “A very bad man.” It was quite possible to disagree with Topley, very difficult not to love him.

H. M. CLARKE, M.B., B.Ch.

We regret to announce the death on Jan. 11 in a nursing home at Reading of Mr. H. M. Clarke. Born in 1878, Henry Milford Clarke received his early education at Wakefield Grammar School, from which he entered Clare College, Cambridge, with a classical scholarship in 1897. He graduated B.A. in the Natural Sciences Tripos in 1900, B.Ch. in 1905, and M.B. in 1906. From Cambridge he went to Guy's Hospital, where he was house-surgeon to Sir William Arbuthnot Lane and to Mr. Frank Stewart and was out-patient officer. In 1907 he went to Reading, where he soon entered upon his long association with the Royal Berkshire Hospital, which continued until ill-health compelled him to retire from practice a few years ago. He held the posts of surgical registrar, surgeon to out-patients, and finally surgeon. Clarke was incapacitated by illness some little time before the age (60) for retiring from the honorary surgical staff; when he reached that age he was elected an honorary consulting surgeon to the hospital. He was an active member of the Reading Zoological Society, which he joined in 1908 and of which he was president in 1933-4. During the last war he held several surgical appointments in succession, serving from October, 1914, to May, 1919. He was seconded to the French Army base hospital at Rennes; surgeon to the *Aquitania* until the evacuation of the Dardanelles; surgeon at a casualty clearing station in France, where he was severely wounded in 1917; and surgeon specialist in Malta.

In his younger days Clarke was keenly interested in rugby football and rowing. He rowed in his college boat in the May races, the crew achieving the coveted four “bumps,” and for the Reading Rowing Club. He also played for the Berkshire Wanderers (Rugby) Football Club. Clarke was a very modest man, and only those intimately associated with him in surgical practice could realize fully his surgical skill and his devotion to surgery. His long service to the Royal Berkshire Hospital was rendered in the quiet, unobtrusive manner characteristic of him. In sport he played with the true team spirit, shunning all personal notoriety. He was a deservedly popular man, and his passing is mourned by a wide circle of friends and patients. He leaves a widow, to whom deep sympathy is extended by all who knew them and enjoyed their friendship.

Mr. W. BERNARD SECRETAN, consulting surgeon to the Royal Berkshire Hospital, writes:

Clarke was a man of extremely modest character, good-natured to a degree and with a charming manner. I should think he never had a quarrel. He was a man of parts, but owing to his unassuming character this was not sufficiently appreciated. He had an excellent knowledge of several languages and was accustomed in his vacations to visit Continental clinics to improve his medical outlook. He was a Fellow of the Zoological Society and was intensely interested in all animal life, and particularly in bird life; he had a very fine collection of shells, on which he was quite an authority. He was an extremely good surgeon, both as diagnostician and operator; he would, I think, have become even better known in this direction had he been less inclined to self-depreciation. He was unfortunately cut down in his prime by an illness which left him incapable of work for a good many years before his death. Everyone at the Royal Berkshire Hospital will remember him with affection.

We regret to announce the death of Dr. JEAN MARR on Jan. 2. Jamesina Jane Marr was born in Banffshire, Scotland, on Jan. 19, 1875, and qualified M.B., Ch.B. at Edinburgh in 1907 and took the D.P.H. at the same medical school in 1909. She held resident posts at the Edinburgh Hospital for Women and Children and the Aberdeen Sick Children's Hospital and was for a time assistant school medical officer at Aberdeen. For over 30 years Dr. Marr was in practice in Glossop Road, Sheffield, until compelled by failing health to give it up in 1937. She was a member of the B.M.A. until her retirement as well as of the Medical Women's Federation and the North of England Obstetrical Society. Her practice was largely devoted to the treatment of women and children, and she became locally well known as an obstetrician. She was a deeply loved practitioner who, it can be said, devoted her life to her profession. She was, in short, the real family doctor whose advice was sought on many problems not necessarily medical. She was extremely generous to the less-well-off, and she will be affectionately remembered by a large number of women who received treatment from her but never an account.

## Medico-Legal

### WHAT IS A SHOP?

A salesman came twice a week to the same pitch in the uncovered part of the Leeds City Market and set up a stall, consisting simply of a board supported by two trestles. One day he sold to an inspector of the Pharmaceutical Society some medicine of a kind which under the Pharmacy and Medicines Act, 1941, s. 12 (2), may not be sold by retail, except at a shop. Prosecuted before the stipendiary, he argued in his defence that his stall was a shop. The magistrate held that he was wrong and convicted him, but agreed to state a case for the Divisional Court. The Act refers for the definition of a shop to the Shops Act, 1912, which says that a shop includes any premises where any retail trade or business is carried on. The salesman seemed therefore to have a fairly strong case. The Lord Chief Justice, however, insisted on considering the definition in relation to the objects of the Pharmacy and Medicines Act and its other provisions. The Act seemed to him clearly to provide machinery by which the status of the profession or trade would be raised or maintained. In many passages Parliament seemed to have contemplated that the “shop” dealt with in the Act should be a place defined by precise limits upon which or upon part of which there was some sort of a structure. He thought it necessary to consider, not only whether a retail trade was carried on, but whether there were any “premises” where it was carried on. He did not find any particular help in the authorities. He agreed with an earlier dictum that the Legislature meant to give (in the Shops Act) an extended and unnatural meaning to the word “shop,” a meaning that went far beyond the popular and recognized meaning. Nevertheless, he did not find that the words “premises where a retail trade is carried on” were so wide as to mean that a place unbounded by any ascertainable marks or fences, with no structure except two trestles and a board, with no continuity or regularity except business twice a week, was a shop. The court therefore held that the salesman had been rightly convicted of infringing the Pharmacy Act. The decision will probably put a stop to a good deal of informal trading in medicines which the Act was designed to check, but it suggests the interesting question: If a pharmacist's shop is destroyed by a bomb, is it unlawful for him to carry on his business on the cleared site, or in front of it, on an improvised counter? If it is, he is at a disadvantage from which other retailers do not suffer.

## Medical Notes in Parliament

### Employment of Disabled Persons

The House of Commons, in Committee on Jan. 18, began consideration of the Disabled Persons (Employment) Bill. Mr. RHYNS DAVIES moved an amendment to include in the definition of disabled persons those suffering from neurosis. He said that cases of neurosis were among the most difficult to deal with in rehabilitation, and he was not sure that, as the Bill stood, the Ministry of Labour could deal with them. The last report of the Ministry of Pensions showed that the largest single group of disabled persons still remaining on their books was that of sufferers from neurosis. Mr. TOMLINSON said there was no doubt that the definition in the Bill covered both physical and mental disease, and Mr. Davies was wrong in saying that mental deficiency would not come under the Bill. Several members having supported the amendment, the ATTORNEY-GENERAL said it was the intention to include people whose mental infirmity arose from mental disease, as well as those whose mental infirmity arose not from disease but from a congenital condition. The amendment was withdrawn. Mr. TOMLINSON then moved a Government amendment, defining "disease" as including a physical or mental condition arising from imperfect development of any organ. The purpose of the amendment was to prevent anybody being excluded. For instance, the imperfect development of the optic nerve might cause blindness, and where the disability was congenital it would be included under his amendment. It was intended to embrace every reasonable case. The amendment was agreed to.

A long discussion took place on an amendment moved by Major MANNINGHAM-BULLER, which, he said, would ensure that if there was to be a "queue" for admission to the training courses the war-disabled should be at the right end of it. The number of persons who would require training must be uncertain, and he did not want to see the war-disabled kept waiting. Sir IAN FRASER said that one of the factors which had caused an almost unanimous second reading of the Bill was the assurance by the Ministry of Labour that if it proved to be necessary they would, by administrative action, see that ex-Service and war-disabled persons would be first considered. Mr. BEVIN said he made that statement with a view to binding his Department not only during his term of office but in the administration of the Bill permanently. He could carry out the principle better administratively if no limitations were put on him. If members would agree with him that this was an industrial and not a pensions matter, he would agree between now and the report stage to find words to meet their desire and to give effect to the intention and pledge of the Government. If they would agree to the use of words such as "preference for persons who have served" instead of merely "war-disabled," he would be happy to meet them. The amendment was negatived.

Sir IAN FRASER moved an amendment to provide that war-disabled persons should be separately recorded in the register, so that ex-Service men and others to whom it was proposed to give a prior place should be clearly recognized. Mr. TOMLINSON said the Department already had this power, and Mr. Bevin undertook that the war-disabled should be put into proper categories so that they might be recognizable. The amendment was negatived, and the consideration of the Bill was adjourned.

### Education Bill

Mr. R. A. BUTLER on Jan. 19 moved the second reading of the Education Bill. He said this Bill completely recast the law as it affected education. The Acts of 1899 and 1921 were repealed. The Bill offered an opportunity to every child to pass through the primary and secondary stages of education, and would give all children over 11 opportunities for making the most of their natural aptitudes. He hoped that from the Bill would arise a healthy development of nursery schools or classes. A complete revision was proposed in the law for dealing with the handicapped child. A duty was to be laid on local education authorities to ascertain all children who, because of disability of mind or body, needed special attention. Mr. Butler proposed to abolish, for educational purposes, certification under the Mental Deficiency Acts. No child who could be dealt with within the education system should in future be described or treated as mentally defective. Only those who could not be educated and those likely to need supervision after leaving school would be appointed to the mental deficiency authorities. Categories of handicapped and backward children, for whom special provisions should be made,

would be defined in regulations and not in the Act to enable advantage to be taken of new developments in medical knowledge or in psychological diagnosis and practice. Children with slight disabilities might be taught by special methods adapted to their needs in ordinary primary and secondary schools. For the more seriously disabled he looked for an extended provision of special schools through local authorities and voluntary endeavour. He was taking power to give additional financial help to the latter. One clause of the Bill gave parents the right to ask for medical examination of any child over the age of 2 with the object of securing special educational treatment.

### Clause 46

The Bill imposed a duty on authorities to provide meals and milk. The proposal was drawn on broad lines so that it could be adjusted to the Government's future decision on family allowances. Clause 46 proposed that local education authorities should be under an obligation to see that all children attending school or a young people's college maintained by such an authority should be able to obtain free medical attention other than domiciliary treatment. Parents would be under an obligation to submit their children to medical attention. Every effort would be made to enable children to take advantage of modern medical and dental treatment. There was no foundation for the fear that the Bill would deprive local authorities of responsibility for medical treatment and confine the work of the school medical officers to medical inspection. Clause 46 was likely to give school medical officers and staff a greater responsibility for the treatment of children. The Government trusted that with the development of the new national health service the duties of school medical officers would be widened and that the school medical service would become part of the general health services of the nation.

The biggest change would be a regular and careful inspection of boys and girls who had left school and entered employment. At present there was no continuation of the medical service to look after them. Co-operation between the school medical staff and the agencies advising young people on choice of employment and physical welfare in industry was to be centred in the young people's colleges. The Government was keen to re-enact, with modifications, Mr. Fisher's proposals for continuing education. The age range in the young people's colleges would be up to 18 for a school-leaving age which at first was to be 15 and later on 16.

Debate continued on Jan. 20, and the Bill was read a second time.

### Regulation 33B

Dr. SUMMERSKILL on Jan. 20 drew attention to the increased incidence of venereal disease in the United Kingdom. She said that Mr. Ernest Brown had refused to take more effective action to reduce this incidence. After six months in which Regulation 33B had been in operation two men had been informed against and 64 women. In addition, 1,780 people had been reported, but by only one person in each case, which meant that 33B did not apply. She was told that the number of new cases in 1942 was 120,000. Any other disease which was a menace to the community was notifiable. Why not this? In Scotland the County Council of Lanarkshire and the burghs in that county had agreed to support a scheme of compulsory notification and treatment. The city of Glasgow was moving in the same direction.

Dr. HADEN GUEST was forced to conclude that the Ministry had not sufficiently stimulated the activities of medical officers of health and other health authorities in this matter. Such officers and authorities were often not particularly interested in prevention of venereal disease. There had been complaints in Allied circles about the numbers of their troops who had been affected in this country, particularly in London. Dr. MORGAN said that in Chicago, when there was compulsory notification and treatment, the figures of the disease went up higher. This had been the case all over America where these measures were tried.

Miss HORSBROUGH, replying to the debate, referred to the Edinburgh Bill, introduced into the House of Commons some years ago, on this subject. What was the best method of getting those affected to go for treatment at the earliest moment? The Ministry had tried to ensure that if people were infected they knew something about the disease and the urgent necessity for treatment at once. If people knew they would have to go to the doctor under a compulsory scheme they would decide to wait because they would not want to be caught up in a compulsory scheme. The Ministry had to let knowledge grow. Without that it would not succeed, whether the country had compulsory notification or not. The figures quoted by Dr. Summerskill were of those who had refused treatment and on whom a notice had then been served. In about half the cases where there had been two notifications the individuals



came forward voluntarily when persuaded. Two names of contacts were required if action was taken compulsorily under 13B, but not otherwise. Difficulty had been experienced by medical officers who were uncertain about the legal aspect. There was an idea that if they interviewed people and asked them whether they were aware they had this disease, there might be subsequent actions for slander or defamation of character. Local authorities had been told that if they instructed the medical officer of health to take such action he was protected.

#### Advisory Committee on Domestic Labour

Mrs. CAZALET KEIR on Jan. 20 asked the Minister of Labour about the progress of his plans for supplying domestic labour to hospitals and other similar services. Mr. ERNEST BEVIN said he found it necessary to give first priority to domestic work in connexion with the care of the sick and wounded, the old and infirm, and young children. He was instructing local offices to pay special attention to the filling of vacancies in this work. An advisory committee had now been formed, under the chairmanship of Mr. McCorquodale, and had held its first meeting. [This Standing Advisory Committee on Institutional Domestic Employment includes one medical member—Dr. F. Hall, County Medical Officer of Health, Lancashire.]

#### Availability of Quinine in Bengal

Sir ARCHIBALD SOUTHBY inquired on Dec. 20 whether adequate stocks of quinine existed in Bengal, and whether it was possible for the public to buy quinine.

Mr. AMERY replied that large quantities of quinine had throughout been available to the Government of Bengal, but until the middle of November the arrangements for its distribution inside the Province were unsatisfactory. These had been improved. Distribution in the famine areas was mainly free through hospitals, doctors, and the military relief organization. Sale to the public was controlled at Rs. 37 per lb., but local shortages had driven trade stocks underground and black market prices were much higher.

#### Decisions of Medical Boards

On Jan. 25 Mr. TOMLINSON, replying to Mr. Kirby, said that there was no provision for appeals against the decisions of medical boards. If, however, medical evidence was produced which suggested that there was some room for doubt regarding the correctness of a man's grading, the case was considered by a medical officer of the Ministry of Labour, and where appropriate the man was re-examined. Moreover, men directed to enrol in the Home Guard had a statutory right to appeal against the direction to a local appeal board, which, if of opinion that the man should be medically re-examined, must recommend withdrawal of the direction with a view to such re-examination.

#### Typhus in Naples

Sir JAMES GRIGG on Jan. 25 informed Mr. G. Strauss that the typhus epidemic in Naples was confined to the civilian population, among whom the incidence had steadily increased since the summer. Control of the epidemic was in the hands of the Deputy Chief Civil Affairs Officer and the United States Typhus Commission. Mass disinfection and the inoculation of key personnel had been organized.

#### The Nation's Milk Distribution

In the House of Commons on Jan. 25 Colonel LLEWELIN made an explanatory statement on the new Defence Regulation G, which imposes restrictions on the sale of raw milk in certain areas. He said that the policy of the Government on measures to improve the quality of the nation's milk supply was set out in a White Paper published last July. This regulation carried out that policy in so far as it was concerned with the control of the classes of milk sold in certain areas. The need for this control was fully explained in the White Paper. The regulation prohibited the sale of milk by retail in areas to be specified in Orders to be made by him unless it was T.T. milk and, in Scotland, certified milk; accredited milk and, in Scotland, standard milk, so long as in both these cases they were derived from a single herd; or heat-treated, pasteurized, or sterilized milk. The areas which would be specified were those in which a rationalization scheme was in force for economizing the use of men and vehicles, and thereby having the effect of restricting consumers in the choice of their dairymen. No area would be specified until he was satisfied that facilities existed for supplying adequate quantities of heat-treated milk to meet the requirements of the area.

*Mental Hospitals in Scotland.*—On Jan. 18 Major LLOYD asked the Secretary of State for Scotland whether he was aware that the status and administration of the Royal mental hospitals were not considered by the Hetherington Committee, although these hospitals

were an integral part of the health services in Scotland. Mr. JOHNSTON said he was informed that, in refraining from making recommendations based on the evidence which they received on the subject of the Royal mental hospitals, the committee had in mind that the mental hospital service rested on a special code of law which was at present being reviewed by the Russell Committee on the Lunacy and Mental Deficiency Laws of Scotland. The position of the Royal mental hospitals in relation to the proposed new health service was not being overlooked.

*Diet of Miners.*—Sir E. GRAHAM-LITTLE on Jan. 18 asked the Minister of Food whether he would institute an inquiry into the diet of miners and other sections of the community engaged in hard physical labour, as there was evidence that a deficiency in energy-producing items of diet accounted for much of the absenteeism now impeding the production of coal and other vital war efforts. Mr. MABANE replied that the nutritional requirements of every class of consumer were under constant review by his Department, and special attention was now being given to the needs of the types of workers referred to.

## The Services

The *London Gazette* has announced the award of the M.C. to Fl. Lieut. R. J. L. Ferris, R.A.F. The announcement reads as follows:

Fl. Lieut. Ferris, the medical officer of No. 74 Squadron, has displayed outstanding gallantry and devotion to duty. During a period in October, 1943, his headquarters was subjected to severe enemy air attacks. On one occasion four men were killed and two others were buried under the debris. Fl. Lieut. Ferris immediately set to work removing the bodies and releasing the buried men. His medical equipment had been destroyed and he was compelled to work with a pair of scissors and a small wood-saw, with which he succeeded in releasing one man after amputating his leg. Fl. Lieut. Ferris accomplished this while the air attack was in progress and worked with very little light and while held upside down by his legs. During an engagement between British and enemy ground forces he treated military and civilian casualties alike. Fl. Lieut. Ferris worked incessantly under most rigorous conditions. His coolness and courage proved a source of inspiration to all.

The Efficiency Decoration has been conferred upon the following officers of the Territorial Army: Col. H. A. B. White Locke, late R.A.M.C.; Lieut.-Col. (temp. Col.) W. H. Marston; Lieut.-Cols. T. F. Arnott, O.B.E., and S. J. Hartfall; Majors (temp. Lieut.-Cols.) J. A. Bruce and F. Heywood-Jones; and Majors H. W. Davies, L. F. Jefferoot (T.A.R.O.), C. R. L'E. Orme, and L. F. Richmond, R.A.M.C.

The following have been mentioned in dispatches by Air Officers Commanding-in-Chief:

Gp. Capt. J. K. R. Landells; Gp. Cpts. (Acting) A. Harvey, C. J. S. O'Malley; Wing Cmdrs. T. J. X. Canton, L. E. A. Dearberg, G. A. M. Knight, J. W. Patrick, C. E. G. Wickham; Wing Cdrs. (Acting) H. H. S. Brown, R. C. Jackson, J. H. L. Newnham; Wing Cmdr. (Acting) E. B. Harvey, R.A.F.O.; Squad. Ldrs. W. Hargrave-Wilson, A. L. Knipe, M. L. Maley, S. Rogers, A. S. Simpson, D. Turner, J. L. W. Walls, R.A.F.V.R.; Squad. Ldrs. (Acting) B. J. Bickford, E. R. Brown, I. W. H. R. Cran, C. F. Hamilton-Turner, W. L. Hector, R. N. Houlding, D. A. Ker, H. J. Little, P. J. O'Connor, J. E. Smith, D. Stafford-Clark, M. W. L. White, R.A.F.V.R.; Fl. Lieuts. T. G. Band, A. J. Chiappa-Sinclair, P. J. Bryce-Curtis, R. C. Dickson, R. E. Glennie, C. M. Liddell, A. D. MacLean, A. F. Pearson, T. Primrose, O. H. Sennett, J. A. Sutton, H. M. Urquhart, R.A.F.V.R.; Squad. Officer (Acting) A. L. J. Dovey, W.A.A.F.

#### CASUALTIES IN THE MEDICAL SERVICES

*Killed in action.*—Capt. J. F. V. Lart, R.A.M.C.

*Reported missing.*—Surg. Cmdr. H. de B. Kempthorne, R.N.

*Killed.*—War Subs. Capt. D. W. Forgan, R.A.M.C.

## Universities and Colleges

#### UNIVERSITY OF EDINBURGH

At a graduation ceremonial on Jan. 22 the following medical degrees were conferred:

M.D.—T. G. Brown, Christina M'D. Taggart.  
Ph.D.—(In the Faculty of Medicine): F. Alexander.  
M.B., Ch.B.—P. Aitken, \*C. A. Barrett, E. Bindman, T. F. Boyle, D. Cameron, J. A. Campbell, T. I. Cleithon, T. G. Crombie, A. W. Cunningham, J. N. Dobson, T. E. Donaldson, K. Drummond, W. A. Eagles, J. T. Kin, W. H. Elliott, S. J. Evans, J. W. Farquhar, D. H. Forster, G. F. Hawkins, A. G. Henderson, D. W. D. Hendry, J. M. Herd, J. M. Kerr, D. K. Kouyoumdjian, C. E. Lim, I. W. F. Lumsden, H. F. Low, \*R. J. M. McCormack, G. D. McDonald, A. H. McEerrow, R. S. McNeil, J. H. Macpherson, D. MacVicar, J. D. Malloch, J. S. Milne, J. F. G. Mitchell, R. G. Mitchell, T. R. Nelson, J. A. Paterson, R. M'C. Paterson, R. G. Pinkerton, R. R. Pratt, K. Rhaney, \*I. M. Richardson, Jessie R. Robinson (née M'Laren), G. J. Romanes, R. S. Ross, J. T. R. Russell, Isabella M. Scott, J. H. Scott, B. M. L. Shields, E. S. Shoucair, Catherine M. G. Smith, Margaret S. Stevenson, R. C. F. Todman, \*P. R. Walbaum, J. H. Walmsley, I. Wang, Elizabeth Whalley, W. E. J. Wilson, G. D. Wright.

\*With honours

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales during the week the notifications of whooping-cough rose by 220, but those of acute pneumonia dropped by 314. There were 44 fewer cases of scarlet fever and 28 fewer of cerebrospinal fever. Notifications of measles went up by 44.

There were 197 deaths from influenza in the great towns, a fall of 58. For the week ending Jan. 22 the influenza deaths numbered 143. Almost one-third, 61 deaths, were recorded in the Greater London area, although only 19 were registered in the administrative county of London.

The only large variation in the county totals for whooping-cough was an increase in Essex of 40. The lower incidence of scarlet fever was due to the northern counties; in the south there was a tendency to a higher incidence. The only feature of note in the trend of measles was the small but continuous rise in London from 36 to 98 in the past three weeks. The decline in the notifications of pneumonia was general throughout the country, except in the north midland region, where there was a slight rise.

Dysentery notifications were 10 more than in the preceding week. The largest returns were London 34, Kingston 18; Lancashire 38, Manchester C.B. 29; Sussex 27, Chichester R.D. 14, Bognor Regis U.D. 9; Essex 13, Rochford R.D. 10.

In Scotland notifications of measles and whooping-cough rose respectively from 43 to 207 and from 121 to 252. Notifications of acute primary pneumonia dropped by 159 and those of diphtheria by 21. The rise in measles was due to two towns, Glasgow and Paisley, where increases of 104 and 59 were recorded. Glasgow, with a rise of 108, was the only centre with a large increase in the notifications of whooping-cough. One case of typhus was reported from Ayr county.

In Eire there was a decline in most infectious diseases, but the incidence remained unchanged in Dublin C.B.; 85% of the total notifications of measles, one-half of whooping-cough, and more than one-quarter of diphtheria were reported in this city.

In Northern Ireland the notifications of diphtheria rose from 32 to 51.

## Week Ending January 22

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,110, whooping-cough 2,215, diphtheria 712, measles 661, acute pneumonia 1,122, cerebrospinal fever 70, dysentery 148, paratyphoid 2, typhoid 2. Influenza deaths in the great towns numbered 143.

## Points from Abroad

The epidemic of typhus in Naples, which has so far been confined to civilians, has reached such proportions that it constitutes a potential menace to the military effort in Italy. A six-point programme has been put into operation by the American Typhus Commission. Disinfection stations have been established, where as many as 70,000 civilians are treated each day. A vigorous search has been made for all possible cases. Immunization by serum has been organized. The outbreak began under German occupation, and has increased as a result of overcrowding and lack of adequate facilities to deal with the thousands of refugees, and of the demolition of the water and gas supplies by the Germans.

It is reported from Berlin that the incidence of stillbirths has risen from 2.8% in 1942 to 5.1% in 1943.

The following figures are quoted from *Wirtschaft und Statistik*. The number of births in 1943 was 995,744 in Germany and the incorporated territories. Deaths (civilians only) amounted to 725,257. There were 42,000 fewer children born than in 1942. In the period 1940-3 the deficit of births compared with the position in 1939 was 892,000, whereas in the years 1915-18 it was roughly 3,000,000. There were 20,700 fewer deaths among the civilian population in Germany than in 1942.

It is reported from Berne that in France the high mortality of children constitutes a difficult problem for the Vichy Government. The number of deaths exceeded the number of births in 1942 by 93,626, as compared with 55,758 in 1938.

According to statistics compiled by Dr. Veld, Medical Inspector for National Health in South Holland, the number of diphtheria cases confirmed in 1938, 1939, 1940, 1941, and 1942 amounted to 1,272, 1,273, 1,732, 5,452, and 19,417 respectively. In 1943 up to and including Oct. 31 there were 40,336 cases.

No. 2  
INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 15.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable; or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	64	4	19	1	5	96	8	24	4	3
Deaths	—	—	—	—	—	—	—	—	—	—
Diphtheria	673	41	158	106	51	764	45	231	97	31
Deaths	16	1	2	3	—	27	—	2	6	1
Dysentery	175	34	39	—	—	96	18	31	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Enterobacteriaceae	1	—	1	—	—	2	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Enteric fever	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years	61	13	10	14	7	41	3	11	2	4
Deaths	—	—	—	—	—	—	—	—	—	—
Measles	559	98	207	71	2	12,322	630	377	18	34
Deaths	—	—	—	—	—	16	—	3	—	—
Ophthalmia neonatorum	78	8	14	—	1	87	2	18	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever	4	—	—	—	—	5	—	—	—	—
Deaths	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenza <sup>1</sup>	1,294	105	50	25	6	1,194	73	12	9	3
Deaths (from influenza)	197	19	12	3	11	89	4	2	1	—
Pneumonia, primary	—	—	357	18	—	—	—	276	13	—
Deaths	—	—	79	21	6	—	—	12	8	—
Poliomyelitis, acute	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute	9	2	1	1	1	8	1	—	8	3
Deaths	—	—	—	—	—	—	—	—	—	—
Puerperal fever	—	—	12	—	—	—	—	15	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia <sup>2</sup>	152	12	13	2	1	159	10	15	—	3
Deaths	—	—	—	—	—	—	—	—	—	—
Relapsing fever	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Scarlet fever	1,742	146	229	29	92	1,957	155	339	57	52
Deaths	—	—	—	—	—	—	—	—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever	1	—	2	1	3	4	—	1	3	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	1	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Whooping-cough	2,023	184	252	52	12	1,504	112	124	45	8
Deaths	13	1	1	—	—	10	—	2	3	—
Deaths (0-1 year)	431	79	70	37	22	434	44	74	50	19
Infant mortality rate <sup>3</sup> (per 1,000 live births)	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths)	5,715	975	739	292	170	6,002	857	694	261	150
Annual death rate <sup>3</sup> (per 1,000 persons living)	—	—	—	—	—	—	—	—	—	—
Live births	6,363	744	833	378	251	6,519	804	910	392	234
Annual rate per 1,000 persons living	—	—	—	—	—	—	—	—	—	—
Stillbirths	195	14	39	—	—	238	28	43	—	—
Rate per 1,000 total births (including stillborn)	—	—	—	—	—	—	—	—	—	—

<sup>1</sup> Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

<sup>2</sup> Includes puerperal fever for England and Wales and Eire.

<sup>3</sup> Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

# Medical News

The British Association of Physical Medicine is meeting at 11, Chandos Street, London, W.1, to-day, Saturday, Feb. 5, at 2.30 p.m., to discuss the objects of the Association under the heading "The Place of Physical Medicine in Teaching and in Practice." Several short papers will be read before the discussion takes place.

A meeting of the Clinical Society of the Royal Eye Hospital will be held at the hospital, St. George's Circus, Southwark, S.E.1, on Friday, Feb. 18, at 4.30 p.m., when a talk will be given by Dr. Francis E. Preston on "Ophthalmic Prescribing and Therapeutics."

A meeting of the London Association of the Medical Women's Federation will be held in the Common Room of B.M.A. House on Saturday, Feb. 19, at 3 p.m., when Miss Jean Dollar, F.R.C.S., D.O.M.S., will speak on sulphonamides in ophthalmology.

A Chadwick Public Lecture will be given on Tuesday, Feb. 22, at 2.30 p.m., at the Royal Society of Tropical Medicine and Hygiene, 26, Portland Place, W., by Mr. C. E. A. Bedwell on "The Place of the Hospital in the Health Service." The lectures for the spring programme, 1944, will deal generally with public health matters and the war. Admission is free.

The meeting of the Nutrition Panel of the Society of Chemical Industry will be held at Burlington House, Piccadilly, W., and not at 56, Victoria Street, Westminster, S.W., as stated in the issue of Jan. 29 (p. 169).

It is announced that Prof. H. W. Florey, F.R.S., has left England for Russia to pass on to Soviet doctors his knowledge of penicillin as a therapeutic agent. Prof. Florey returned recently from the Middle East to present to the War Office and the Medical Research Council a detailed report on the use of penicillin in war wounds. (See *Journal*, Dec. 11, 1943, pp. 750 and 755.)

A Turkish medical mission has arrived in this country to study medicine and surgery in wartime, under the auspices of the British Council. Its members have been nominated by the Turkish Ministry of Health. Dr. Hüseyin Avni Aksef has for the past 10 years worked at the Haseki Hospital, Istanbul, where he is now chief surgeon, and has lately taken special interest in surgery of the lung. Prof. Burhanettin Tugan was appointed in 1928 professor of clinical chemistry at the Gülhane Military Medical School, and still holds that post. As a lieutenant-colonel in the Turkish Army he is a member of the Military Medical Academy, and he is also a member of the Turkish Medical Council. He represented Turkey at the 9th and 10th International Congresses of Military Medicine. Dr. Bekir Nimetullah Taskiran was chief assistant in the surgical clinic of the Faculty of Medicine, Istanbul, and has just been appointed chief surgeon at the Ankara Model Hospital. A small reception was given in their honour.

## Intestinal Flatulence

**Q.**—What are the causes of intestinal flatulence, offensive and inoffensive, but such as to give rise to abdominal discomfort? I can find no authoritative analysis of the gases produced in the intestine. What are they? Where such production is excessive what medicinal and dietetic measures should be taken to remedy the state of affairs?

**A.**—The commonest cause of intestinal flatulence is intestinal carbohydrate dyspepsia. Starch in its natural cellulose envelope is insufficiently digested in the small intestine and consequently undergoes fermentation in the colon. The gases produced—mainly carbon dioxide and methane—are odourless, but may cause much discomfort by the distension they cause. In severe cases the organic acids produced irritate the colon sufficiently to cause diarrhoea. The flatulence can be overcome by a diet containing no starch in its natural form—i.e., no potatoes or other root vegetables, and no rice, sago, or tapioca. Bread and puddings made from prepared starch are allowed in moderation, and there is no need to restrict sugar.

Much less often flatulence results from putrefaction of proteins which have escaped digestion in the small intestine. The quantity of gas produced is comparatively small, but it is very offensive. Diarrhoea is often present. The commonest cause is excessive indulgence in purgatives, and it may even result from taking too much paraffin. It does not result from deficient peptic digestion in achlorhydria, but is a common result of the deficient secretion of trypsin caused by carcinoma of the pancreas. In the absence of the latter the production of offensive gas can generally be prevented by avoiding aperients. In any case a dessertspoonful of powdered charcoal three times a day will deodorize offensive intestinal evacuations.

## Enuresis in Childhood and Adolescence

**Q.**—What investigations are necessary to discover the causes of enuresis, and what treatments might be tried before sending the child to join the child guidance waiting list.

**Q.**—A boy of 17 has been troubled with enuresis for years. Atropine, belladonna, etc., have no curative effect. Would complete hypnotic treatment be likely to cure, and how long would a course take? At present the boy and a younger brother have a bedroom to themselves in a "public school," but he may be leaving school in a few months, and he fears this trouble being a handicap to him in life. The profession, I was told, object to hypnotic treatment (and the school doctor refused to try it, trusting to time as a cure). Why this objection? It seems to me unreasonable.

**A.**—Habitual enuresis, apart from rare instances in which organic factors can be discovered, is a psychogenic disorder. The organic factors to be excluded are: disease of the urinary tract; disease of the C.N.S., especially nocturnal epilepsy, petit mal, and spina bifida; diabetes mellitus and insipidus. Severe mental defect must also be listed.

This done, attention must be focused on the psychological background of the patient—usually a child. Enuresis, like other psychoneurotic symptoms, is an expression of mental protest. It means usually the unconscious assertion or reassertion of claims to irresponsible babyhood. Such a lapse into infantile modes of behaviour is most frequently due to lack of the sense of security in the child's relationships with its world. This may be caused by illness; by negligent, spoiling, or nervous parents, too unsure of themselves to apply healthy discipline and to encourage development towards maturity, or else making too severe demands. In such cases enuresis is a symptom of persistent dependence, and in a sense a due reward of the parental attitude. More often, however, enuresis appears, after a period of normal control, when the child's sense of security is threatened by a change in its habitual environment. The death of a loved person; the birth of a baby, displacing the patient from accustomed priority; the onset of school life, making extra demands on him, especially if he is intellectually handicapped—are common factors. In wartime the loss of security through evacuation to not always congenial strange foster-parents and through the break-up of the child's familiar world is a typical situation precipitating the regression to loss of bladder control. In the child's mind enuresis may mean aggressive, dependent, or self-gratifying impulses—most likely all three. The vicious circle is completed through guilt and inferiority feelings.

Investigations into the history and present conditions of the child's emotional development are therefore necessary. Much can be done by the understanding doctor with time to spare for a long exploratory talk with the parents, school teachers, etc., as well as with the patient. In brief, treatment must aim at eliminating causes for feeling unloved, wanting to see safety; at removal of guilt feelings and discouragement, and at the reward of progress in control. There is no sense in giving medicine or prescribing fluid-intake regimes, as these further cloud the issue and make the child and its guardians take a wrong view of the condition. Many cases may respond quickly to quite simple encouragement and interest in helping them. For the rest, the child

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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## ANY QUESTIONS?

### Degeneration of Pyramidal Tract

**Q.**—A man aged 60 years, who has suffered for many years from a familial form of degeneration of the pyramidal tract, at first thought to be a primary lateral sclerosis, has for the last ten years suffered from rheumatoid pains in joints and muscles. These pains are at times very severe and disabling. Ordinary analgesics are useless. Is any form of light treatment likely to be of use, or drugs?

**A.**—The data are insufficient to form an opinion in this case; it is not clear what is meant by "rheumatoid" pains in joints and muscles. It would seem probable that the pains originate in the spinal centres unless there are local changes. It is very unlikely that any form of light treatment would help. Short-wave diathermy in skilled hands would be worth a trial, but haphazard application would be futile. The only drugs likely to be of service are analgesics. Has pehidine been tried? Potassium iodide might also be indicated.

guidance clinic, with or without waiting list, exists to cope with the quite involved social problems such cases sometimes present, in which the child is but a pawn demanding consideration through nuisance value.

The inquirer's attention is drawn to the relevant and wise letter by Dr. Herbert W. Bland in the *Journal* of Jan. 15 (p. 93).

The school doctor in the second case was probably wise to refuse to "try hypnosis." Objection to hypnosis springs from two rather different motives. One is an unreasoned prejudice against this method altogether; the other is an informed assessment of its value in this type of case. Most of what has been said above in regard to causation holds good also for the stresses of adolescence. Hypnotic suggestion in the hands of the trained psychiatrist may possibly be the final method of choice. But it must be preceded by diagnosis of the conflicts and maladjustments of the patient, of which enuresis is the outward and visible sign. The school doctor's objection, on the face of it, might have been based on the first of these objections, his optimism with regard to "time as a cure" is not often borne out by the after-history, and he suggested nothing positive. The case would seem to be eminently suitable for investigation by an "expert," as otherwise the patient's own fears may indeed be justified. Psychopathology has reached a stage of development when blind empiricism in therapy is as little justified here as in any other branch of medicine. The tempting use of the magic of hypnosis will not necessarily have done anything to alter the balance of mental forces of which the enuresis was the outcome, and which, rather than the symptom, is the essence of the patient's disability. The reasonable objection to the employment of hypnosis is, therefore, analogous to our preference for finding out why somebody is weeping rather than for plugging his lacrimal ducts.

#### Rectal Paraldehyde during Labour

**Q.**—Further to your reply to the question on analgesia in labour in the *JOURNAL* of Jan. 1, p. 30, I should be glad to have details of the technique of the administration of rectal paraldehyde during labour and to know what risks are associated with this treatment.

**A.**—A safe maximum dosage is based on 1 drachm of paraldehyde per stone of body weight. In actual practice 6 drachms of paraldehyde gives good results in all but the biggest and heaviest patients. It is conveniently made up in 4 oz. of saline or olive oil when this is procurable. Following the administration of an enema early in the first stage the paraldehyde is slowly injected into the rectum, preferably taking 10 to 15 minutes over the process. It is an excellent basal anaesthetic, is not associated with any risk to either the patient or the child, the only danger being over-dosage—namely, giving ounces instead of drachms. For this reason a careful check is essential before the administration of the drug. Cases in which the vertex is deep in the pelvis a soft catheter would be inserted per rectum above the level of the head. Otherwise the paraldehyde is liable to be returned.

#### Tonic Action of Strychnine

**Q.**—I should welcome an authoritative statement on the action of strychnine as administered in ordinary therapeutic doses. (1) Do the ordinary iuxta-ventricular nuxtures have any "tonic" action in, for example, cases of post-influenza debility, or is the action of such nuxtures little more than that of a stomachic? (2) What are the older views on the value of strychnine as an emergency injection such conditions as pneumonia and heart failure?

**A.**—1. Strychnine in ordinary therapeutic doses undoubtedly has tonic actions apart from its action as a stomachic. It can be shown, for example, that it causes a measurable increase in the field of vision, and there is no reason to doubt its value as a general tonic. 2. Strychnine is not of much value in an emergency. It does not stimulate the heart, and acts on the respiratory and vasomotor centres only when given in convulsive doses. Other drugs, such as nikethamide or leptazol, have more action on these centres and may thus indirectly revive a failing heart.

#### Marginal Gingivitis in School Children

**Q.**—What advice or treatment should be given for the minor degrees of marginal gingivitis so commonly seen in school children? Some cases it is associated with, in others independent of, regularity. The worst degrees are commonly in the upper or lower incisor region.

**A.**—Any state of ill-health or lowered resistance will increase a liability to a marginal gingivitis, but the local factor is a stagnation of saliva and food debris. It is essential, therefore, that in the treatment of the condition inquiries should be made into the life of the child and stress laid on the absolute necessity for proper "tooth-brush drill." The teeth and gum margins must be cleaned night and morning, after every meal, and indeed after every drink or glass of milk. Mouth washes help, and chewing gum, procurable, is excellent as it not only cleanses and massages the gums but stimulates the flow of saliva and reduces the craving for sticky sweets. A common-sense routine will clear up almost every

mild case in a few days, but attention must also be paid to any tendency to mouth-breathing, especially during sleep, which is probably the commonest cause of an anterior gingivitis. The aid of the dental surgeon must be sought if any tender tooth is present, causing the child to masticate on only one side of the mouth. Any overcrowding of the mouth is better treated by judicious extractions than by any form of orthodontic appliance. Local treatment, when necessary, will be undertaken by the dentist, but the doctor should satisfy himself that the proper hygiene is carried out at home and that the child has no deficiency in vitamins.

#### Transport of Cases of Fractured Spine

**Q.**—There seem to be conflicting opinions about the first-aid measures to be adopted in suspected cases of fractured spine. How, for example, should a man found lying prone in the street be moved on to a stretcher if thought (a) to have a broken neck, and (b) to have a broken back? An authoritative answer to this question would assist many G.P.s who are now giving lectures on first aid.

**A.**—Patients with suspected spinal fractures should be shifted and moved in such a way as not to be folded either backwards or forwards. The patient should be disturbed as little as possible, being transported "as he lies." From the point of view of the spinal injury, no matter at what level, there is no indication for change of position from face to back or vice versa.

#### Hereditary Factor in Psoriasis

**Q.**—What part does heredity play in psoriasis? My experience has been that it does not play as important a part as textbooks would lead one to believe. What are the possibilities of the condition being transmitted if it only develops in early adult life as isolated patches on the scalp, apart from one small chronic patch on the leg since childhood?

**A.**—There would seem to be no doubt that psoriasis is transmissible from one generation to another, and that it may occur in several members of a family. Cockayne in his monograph, *Inherited Abnormalities of the Skin*, comments upon the paucity of the published pedigrees. Expressed in percentages the family incidence as recorded by various observers, quoted by Cockayne, varies from 15 to as high as 63%. This second figure hardly accords with the experience of dermatologists in Great Britain. The chance of transmission is unlikely to be modified because the disease has developed in early adult life and in a limited form.

#### Treatment of Leucorrhoea

**Q.**—What is the treatment of leucorrhoea, often met with in school-girls, especially of the poorer classes?

**A.**—Leucorrhoea is taken to mean an increase in the normal discharges and not a purulent discharge due to infection. Such an increase at puberty is physiological and temporary; tending to resolve spontaneously. Apart from this, troublesome leucorrhoea in young girls is usually associated with general debility (as after serious illness), malnutrition, lack of cleanliness, sedentary habits, and constipation. Occasionally an erosion of the cervix may be the cause. Treatment should therefore be on general lines—attention to cleanliness, regular exercise out of doors, adequate diet, general tonics, haematinics if there is anaemia. Saline aperients and daily cold baths or contrast baths may help.

Local treatment should be avoided if possible in young girls. As a last resort, astringent douches such as 1% alum can be used, or an erosion of the cervix cauterized.

#### Quality of Breast Milk

**Q.**—Can breast milk be deficient in quality while sufficient in quantity in a healthy mother? This question is prompted by the case of a healthy mother with apparently ample milk and a healthy baby of six weeks who appears to be satisfied with the volume of breast milk after bringing up wind, and yet in 1 to 2 hours wakes up hungry. After a feed of dried milk he rests satisfactorily. His stools are normal usually, but sometimes curdy, and he is gaining weight at the normal rate.

**A.**—Minor qualitative variations can of course occur. A mother on a deficient diet probably cannot produce an adequate amount of vitamins in the milk. But as regards the caloric value it is doubtful if this varies much. Workers in India have described how mothers dying of starvation have nevertheless fed babies at the breast who gained in weight. So the obvious deduction from the question is that the child is not getting enough to eat. "Ample milk" is too loose a phrase. Test feeding would settle what was the daily quantity available, but even then the exact requirements of the baby cannot be calculated. A common-sense deduction from the facts as stated is either that the baby is underfed or that he is overfed, getting a pain in his abdomen 1 to 2 hours after a feed which is relieved by a warm feed. If he is gaining weight at the normal rate with the dried milk feed in addition, it suggests that he is actually underfed at the breast.

## Influenza Immunization

Q.—Is it possible to produce active immunity towards epidemic influenza? Is it best to use a "virus suspension" or a vaccine?

A.—Epidemic influenza is a virus disease, and the reagent used for active immunization must therefore be a preparation of virus. Such virus vaccines, usually in the form of infected monse-lung suspensions, have been shown to raise the specific antibody content of the blood, but in field trials the method has on the whole given disappointing results in the prevention of the disease. Reasons for this are not far to seek, and two of them are of such weight that it is difficult to see how any considerable improvement on the present position is likely to be achieved. These are:

1. For such immunization to be regularly successful the disease must be caused by a single organism of constant antigenic composition, as in the case of typhoid fever. In influenza this is not so; it has at least three causes: two antigenically different viruses known as A and B, while in some further cases, since neither of these viruses is found, a third agent must be responsible.

2. The immunity produced by a natural attack of the disease may be short-lived: there are well-attested cases in which two attacks due to virus A have occurred in the same season. If the disease itself sometimes immunizes so incompletely, what can be expected of an artificial method?

If the word "vaccine" in the question refers to a bacterial vaccine, the answer is that this can protect only against that form of influenza, if it exists, which has a bacterial cause, or against complications. "Anticatarrh" and "anti-influenza" vaccines usually contain five or six species of bacteria, some of which possess many antigenically distinct types (pneumococcus and *Str. pyogenes*, which have been better studied than the remainder, include about 30 each), and the degree of specific immunity so obtainable against any one organism must be very small. The theoretical unsoundness of this proceeding has a counterpart in the results of carefully controlled trials, which have failed to show that any protection is conferred.

## C. diphtheriae in the Vagina

Q.—What is the treatment for vaginal discharge in a girl of 6 years swabs from which are positive for the Klebs-Loeffler bacillus found to be virulent on animal inoculation? The condition has persisted for over three months. The child was immunized at the age of 4 by two doses of A.P.T. Treatment so far tried has been: (1) reinforcing dose of 0.5 c.cm. A.P.T.; (2) 10,000 units anti-diphtheria serum; (3) painting the vulva daily with antidipltheria serum; (4) daily baths and swabbing with mild disinfectant. The general condition of the child is very good.

A.—In view of the obvious difficulty of thorough local examination I would suggest first that the presence of virulent diphtheria bacilli now should be confirmed. Diphtheroids of various kinds are not uncommon in the unhealthy vagina, and the original virulent bacilli may have been replaced by a harmless relative. If this is established it is imperative to ensure that the child is Schick-negative. This could reasonably be assumed, but the point should be rechecked, and if she is positive she should be at once given diphtheria prophylactic, preferably A.P.T. Also, the people endangered by direct contact should be Schick-tested and, if positive, protected by immunization. If true diphtheria bacilli are present and the child is Schick-negative, probably toxin from the bacilli plays virtually no part and the bacilli are flourishing "extracorporeally," as in the case of a Schick-negative child carrying virulent bacilli in nasal mucus. It follows that further active immunization, or antitoxin locally or elsewhere, is not called for. Careful local examination by a gynaecologist may reveal some unhealthy focus—e.g., an infected gland or even an endocervicitis where the bacilli harbour and from which they must be routed by appropriate local treatment (in which sulphathiazole powder might play a part). Is trichomonas present?

## INCOME TAX

## Annual Payment under Covenant

E. F. makes annual payments of £240 a year to his step-sister under a covenant, the terms of which are not such as to be void for income-tax purposes. What is the method of obtaining relief?

A.—What E. F. has done in effect is to transfer £240 of his income to his step-sister. He should deduct tax at 10s. in the £ from each payment made on account of the annuity. That will give him the relief due to him, but, of course, he must account to the Revenue for the tax so deducted and retained by him. He must accordingly pay tax at 10s. in the £ on £240 of his income, which means that he will have to forgo the earned income relief on such grant of his earnings as have to be used to make up the £240 a year. The step-sister, of course, claims repayment of such part of the tax as may be necessary to give her the allowances she is entitled to—i.e., on £80 personal allowance, £50 child allowance, and at 3s. 6d. in the £ on the balance of £110.

## LETTERS, NOTES, ETC.

## Umbilical Hernia

Dr. ANN MOWER WHITE (S.E.17) writes: In your reply on umbilical hernia (*Journal*, Dec. 11, p. 771) I was a little surprised to read that "most of these cases, however, can be satisfactorily treated if from the earliest days any attempt at protrusion of the umbilical stump is overcome by padding a penny and using it as a splint. It can be kept in place by adhesive tape or a binder." As this recommendation is contrary to modern practice, I venture to quote from *Clinical Paediatrics*, by Morse (p. 83). "It is useless to try to prevent or cure an umbilical hernia with a pad and tight flannel binder. . . . The best treatment is with a plaster strap. It should be two inches in width; the hernia should be pushed in and then the skin on each side of the navel folded in to act as a splint. The strap should then be applied. . . . It is not advisable to use a coin or button over the navel, under the strap, because although the coin or button may prevent the hernia coming out, it does not favour the closing of the ring in the way the folding of the skin does." Holt and Howland in *Diseases of Infancy and Childhood* (p. 93) also state: ". . . the skin along the line being folded inward so as to overlap the tumour, thus forming a retention pad." From my personal experience I can say that I have treated many hundreds of cases in this way with satisfactory results.

## Treatment of Leukaemia

Dr. A. PINEY (London, W.1) writes: The answer to the question about the treatment of leukaemia in the *Journal* of Jan. 22, p. 137, is both incomplete and misleading. Irradiation is not the only method of treating this disease; arsenic is of at least equal value, and in the early stages offers several advantages. Thus, in leukaemia, every therapeutic weapon becomes blunted sooner or later, and it is therefore best to start treatment with the mildest agent; later, irradiation can still be used, but arsenical treatment does little good to patients who have already been irradiated. Arsenic properly administered will reduce the leucocyte count, cause diminution in the size of the spleen, and, in febrile cases, will control the fever. Personal experience has amply demonstrated these facts, but for those who prefer the printed word I would call attention to the paper by E. V. Kandel and D. V. Leroy (*Arch. intern. Med.*, 1937, 60, 846) and to the monograph by C. E. Forkner (1938). The treatment of the leukaemias has passed almost entirely into the hands of radiologists, much to the detriment of the sufferers. The time to start treatment is when there is deterioration in the blood picture and some clinical evidence of increased ill-health. I do not deny that radiologists, entrusted with the treatment of a case of chronic leukaemia, rapidly increase the patient's efficiency. But I do assert that a skilfully treated patient—i.e., one whose treatment is planned according to the stage of the disease—will feel as well and will live a good deal longer.

## Infant Feeding

Dr. CATHERINE JAMES (Burgess Hill) writes: I was interested to read the case reported by Dr. Patria Gairdner (*Jan. 8, p. 44*). One does not know whether to be more surprised at the heroic measures adopted or at the infant's vitality in surviving it all, but one short tragic phrase at the very outset clearly shows that the whole illness could have been avoided. We read that the breast feeds of this infant before it was a week old were "complemented with national dried milk." Not long ago a case was reported in your columns of a baby weaned at the third day "because there was no breast milk." When will doctors learn not to interfere with the establishment of the only safe natural method of infant feeding? I should say that only in very exceptional cases should a baby ever be weaned or receive complementary food under the age of six weeks, even if it is losing weight. The vast majority will find, as this unfortunate infant did, that "mother's milk is coming better" in three or four weeks. I write in the hope that other infants may be spared the tragic sequence—overfeeding, diarrhoea, dehydration, intravenous drip, thrombophlebitis, pyopneumothorax. I note too, the sound common sense of this child, who from Feb. 1 "resolutely refused bottle feeds; within 24 hours she was for the first time entirely breast-fed. From that time she never looked back."

Dr. ETHEL EMSLIE (London, W.9) writes: The Ministry of Health report on breast-feeding has omitted one detail which, I think, is of importance in the encouragement of breast-feeding. The mother should be told to assume a comfortable position leaning back in a chair with the infant held well up, not flat, in the hollow of her arm. In this position the baby swallows less air, and the mother obtains two and a half or three hours' rest daily. At the present time mothers appear to be taught in hospitals to sit crouched over the babies lying almost flat on their laps. This is very tiring indeed for the mother, especially if she has little chance of resting at any other time, but it appears to be a universal practice. May I put in a plea for giving complementary feeds, when they are necessary, from a spoon, not a bottle?



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## STUDIES ON HEPATIC DYSFUNCTION

### I. CARBON TETRACHLORIDE POISONING TREATED WITH CASEIN DIGEST AND METHIONINE

BY

J. BEATTIE, M.D., D.Sc.

*Bernhard Baron Research Professor, Royal College of Surgeons of England*

P. H. HERBERT, B.A.

*Leverhulme Scholar, Royal College of Surgeons of England*

C. WECHTEL, M.D.

*Capt., U.S. Army Medical Corps*

AND

C. W. STEELE, M.D.

*Major, U.S. Army Medical Corps*

(From a U.S. Military Hospital, E.T.O., and the Bernhard Baron Research Laboratories, Royal College of Surgeons of England)

The interest of the case recorded below lies in the successful use of a method of treatment not hitherto applied to man. It was felt that the following considerations, which seemed to indicate a probably fatal outcome, justified its adoption: (1) The large quantity of carbon tetrachloride alleged to have been swallowed—30 to 40 ml. The maximum therapeutic dose is 4 ml., but fatalities have been reported with doses as low as 1.5 ml. (2) The probably complete absorption of the drug. Immediate symptoms indicated a rapid entry into the circulation. Vomiting was not induced until 45 minutes after ingestion. (3) The speed with which the liver enlarged. (4) The delay of 19 hours between the accident and the institution of treatment.

#### Case History

An Army Air Force sergeant-pilot (white) aged 23 ingested by mistake "two large swallows" of carbon tetrachloride at 4.15 p.m. on Oct. 2, 1943. The quantity was determined later to be between 30 and 40 ml. No food had been taken since breakfast at 7.15 a.m. The patient noted an immediate "hot burning sensation" in his "throat and stomach." He became rapidly "dizzy and lightheaded," but was able to walk with assistance to the camp infirmary. At 4.35 p.m. he was given large quantities of salt and water by mouth to induce vomiting. This did not occur until 45 minutes after the accident, and was not repeated. The medical officer observed that at this time the patient was confused mentally, and subsequent questioning revealed that there had been a loss of memory of events between his arrival at the camp infirmary and his transfer to hospital at 6.30 p.m. On admission to hospital he was put to bed and given  $\frac{1}{2}$  gr. of luminal to alleviate his apprehension and restlessness. He was still dizzy and nauseated throughout the night, but vomited only once. He refused food on the evening of admission and on the morning of the following day—Oct. 3.

At 11 a.m. on Oct. 3 he came under our observation. One of us (W.) examined the patient, who was restless and complained of dizziness. Jerking movements of the limbs and rolling of the head from side to side were observed. The pharynx was red and injected. Abdominal palpation revealed a tender liver with rounded edge. This edge extended 2 in. below the costal margin in the right anterior axillary line and  $1\frac{1}{2}$  in. below the costal margin in the left anterior axillary line. It was also palpated  $1\frac{1}{2}$  in. above the umbilicus. All these and subsequent measurements were taken during normal respiration, and were confirmed by three observers. No other abnormal signs or symptoms were noted.

At 12.30 p.m. the patient was given 2 g. of *dl*-methionine by mouth. This was retained. At 3.30 p.m. 1 ml. of a casein-digest-methionine solution was injected slowly into an antecubital vein. There was no immediate reaction. Five minutes later 5 ml. was injected, also without reaction. Continuous infusion of the solution by a Murphy drip apparatus was begun immediately. The rate of infusion was about 2 ml. a minute. At 6.30 p.m., when 436 ml. of

the solution had been infused, the patient complained of chilliness, intense headache and backache, and some aching of the limb muscles. The pulse was thin and the lips slightly cyanotic; the blood pressure was 130/20. Infusion was stopped, hot-water bottles and extra blankets were applied, and 5 gr. of an aspirin-cocaine mixture was given. One hour later the colour had improved, the aching had been relieved, and the blood pressure was 120/88. The temperature was 100.8° and pulse 100.

At 6 p.m. it was noted that the liver was still tender and had enlarged considerably. The edge, which was rounded, had reached the level of the umbilicus on the middle line and was between 2½ and 3 in. below the costal margin in the anterior axillary line. At 7 p.m. the patient was given a small meal, which he ate and retained. Nausea, dizziness, headache, and muscle aching had disappeared before 11 p.m. The night was uneventful.

At 9 a.m. on Oct. 4 the patient was mentally alert and made no complaints. Abnormal muscle movements, dizziness, headache, and nausea were absent. The liver was no longer tender on palpation. The edge, which had now become sharp and firm, was half an inch below the costal margin in the right and left anterior axillary lines. He ate all the food placed before him during the day and said his appetite was good. He had a good night.

At 8 a.m. on Oct. 5 he complained that his dizziness and headache had returned. He felt tired and devoid of energy, and his appetite was poor. He was not nauseated and had no abdominal discomfort. The alertness noted on the 4th had been replaced by apathy and listlessness. Questions were answered slowly and with effort. Abdominal palpation revealed that the liver had again enlarged. The edge was rounded, soft, and tender. It was felt one inch below the costal margin in the right anterior axillary line. The spleen was palpable. At 9 a.m. 2 g. of methionine was given by mouth and another 2 g. at 7 p.m. All food presented was eaten. There was no elevation of temperature, pulse, or respiration rate. By 7 p.m. he stated that he felt better. The night was uneventful.

The following morning (Oct. 6) the patient was alert and made no complaints. He said he had a good appetite and expressed a desire to return to duty. Abdominal palpation showed that the liver had again retracted and was palpable about half an inch below the right costal margin on deep inspiration. The liver edge was firm, sharp, and not tender. The spleen could not be palpated.

The patient was retained for observation until Oct. 14, during which time he was symptom-free and received no medication. At no time during the period of observation was icterus noted. The liver was palpable only on deep inspiration during the whole of the period from Oct. 6. He was discharged as fit on Oct. 14 and returned to full duty with his squadron. Between that day and Nov. 2 he was on normal operational flights over enemy-occupied territory. On Nov. 2 he was readmitted for observation. He made no complaints, had an excellent appetite, and said he had been fit since his discharge on Oct. 14. Examination revealed no abnormal signs or symptoms. His liver edge could be palpated only on deep inspiration. It was not tender.

During the period of observation all food given was weighed and its nitrogen and sulphur content estimated from the tables of

McCance and Widdowson (1940). The daily diet contained 100 g. of protein, of which three-quarters was of animal origin. The calorie content of the diet varied between 2,800 and 3,000. The diet was low in fat.

#### Comment on Treatment

Miller and Whipple (1942) showed that fatal liver damage was produced by 30 minutes of chloroform anaesthesia administered to dogs which had been kept on protein-deficient diets for several weeks before. This damage was averted if within 3 to 4 hours after anaesthesia 3 g. of methionine in solution was injected into the circulation. The effect of carbon tetrachloride on the liver is comparable to that produced by chloroform. As our patient was a physically fit young airman whose diet was rich in protein it seemed possible that a massive dose of methionine intravenously might be effective despite the relatively long time which had elapsed since the accident. The small oral dose of methionine (2 g.) was administered pending the preparation of a solution for intravenous infusion.

The infusion was prepared by dissolving 20 g. of a dried papain-trypsin digest of casein in 600 ml. of distilled water. The solution was acidified, and to it was added 15 g. of *dl*-methionine. It was then boiled and filtered. The final pH was 7.6 and the solution was approximately isotonic. It was tested by injecting 20 ml. into the ear vein of a rabbit. No effect was observed within a period of two hours.

The original intention was to administer 15 g. of methionine. This dose was calculated on the basis of 0.25 g. per kg. of body weight, which was approximately the dosage used by Miller and Whipple. In fact, only 9.5 g. was infused, and 2 g. was given by mouth on Oct. 3. Casein digest was added to the solution because it was thought that amino-acids other than methionine might be of some value. As Miller and Whipple had secured good results in their experiments by a single massive dose of methionine it was decided to give no methionine during Oct. 4. The relapse on the 5th, which was treated by giving 4 g. of methionine by mouth, suggested either that our dosage of methionine on the 3rd was too small or that small doses of methionine should have been administered on two or three days after the original massive dose.

The febrile reaction observed in our patient was similar to those reported by other observers (Martin and Thompson, 1943) after infusion of amino-acids. Such reactions are due apparently to too rapid infusion of the amino-acid solutions. It was unfortunate, therefore, that in our patient the rate of infusion was rapid enough to bring on the reaction. A slower infusion might have resulted in the injection of all the solution without reaction, and possibly might have averted the relapse on the 5th.

#### Laboratory Investigations

**Haematology.**—Three blood counts were carried out. The results of these are given in Table I. The raised white count on the 3rd with 74% polymorphonuclear cells was followed three days later by a fall in the white count to 10,500 with a marked rise in the percentage of lymphocytes. There was no significant rise, however, in the total number of lymphocytes. The blood picture almost a month later showed that the lymphocytes had been little affected, and the rise in the white count must be attributed to a rise in the polymorphs. The red cell count calls for no special comment.

TABLE I

Date	R.B.C.	Hb%	W.B.C.	Polymorphs (%)	Lymphocytes (%)	Monocytes (%)	Eosinophils (%)
Oct. 3	5,030,000	100	16,600	74	24	1	1
" 6	5,450,000	—	10,500	53	44	3	—
Nov. 2	5,320,000	100	13,700	61	34	4	1

**Blood Chemistry.**—The various determinations are listed in Table II and commented on later.

**Urine.**—All urine passed after 12 noon on Oct. 3 was collected. Routine tests for albumin, sugar, bile, and urobilinogen were carried out twice daily. Except for the presence of a trace of sugar and a positive urobilinogen reaction in the sample collected between 7 p.m. on the 4th and 7 a.m. on the 5th no abnormality was noted. No acetone bodies were

found in this sample. A few red and white blood cells seen in the sample collected between 3.30 p.m. on Oct. 3 and 7 a.m. on the 4th. No casts were seen in any specimen.

TABLE II

Date	Time	Serum Bilirubin (mg./100 ml.)	Blood N.P.N. (mg./100 ml.)	Blood Amino-N (mg./100 ml.)	Total Cholesterol (mg./100 ml.)	Total Protein (g./100 ml.)	A/G Ratio
Oct. 3	12.30 p.m.	1.10	33	6.4	172	7.3	2.0
" 3	3.30 p.m.	1.30	34	8.7	165	7.5	2.2
" 3	6.30 p.m.	1.90	34	12.7	137	—	—
" 4	6.30 p.m.	0.80	30	5.6	136	7.3	1.9
" 6	8 a.m.	0.88	31	5.2	195	—	—
" 13	8 a.m.	1.00	34	4.9	212	7.4	1.8
Nov. 2	8 a.m.	1.10	39	4.8	197	—	—

The daily urinary output of nitrogen, sulphur, creatinine, and "total creatinine" was estimated. The values obtained are listed in Tables III-VI. The significance of these findings is discussed below.

TABLE III

Date	Urine Vol. (ml.)	Urinary Creatinine (g.)	Total Creatinine (g.)	Total Urinary Nitrogen (g.)
Oct. 3	1,588	1.06	1.12	7.77
" 4	2,730	1.97	2.06	20.64
" 5	1,810	1.55	1.57	12.10
" 6	2,420	1.86	2.08	14.64
" 7	2,210	2.06	2.14	14.78
" 8	2,120	2.01	2.26	14.76
" 9	1,860	2.08	2.10	13.18

The specimen listed for Oct. 3 was collected between 12 noon on that day and 7 a.m. on Oct. 4. All other specimens were from 7 a.m. to 7 a.m., and are listed under the date on which collection started.

TABLE IV.—Nitrogen Balance

Date	Input as Grammes N <sub>2</sub>			Urinary Output (g. N <sub>2</sub> )	Balance
	Food	Methionine and Digest	Total		
Oct. 3	4.8	2.1	6.9	7.8	-0.9
" 4	14.3	—	14.3	20.6	-6.3
" 5	16.4	0.4	16.8	12.1	+4.7
" 6	16.9	—	16.9	14.6	+2.3
" 7	15.7	—	15.7	14.8	+0.9
" 8	16.3	—	16.3	14.8	+1.5
" 9	17.1	—	17.1	13.2	+3.9
	101.5	2.5	104.0	97.9	+6.1

The period listed as Oct. 3 covers the hours between 12 noon on the 3rd and 7 a.m. on the 4th. All other periods are between 7 a.m. and 7 a.m., and are listed as belonging to the day on which collection of urine began.

TABLE V.—Sulphur Balance

Date	Input as Grammes S <sub>2</sub>			Urinary Output (g. S <sub>2</sub> )	Balance
	Food	Methionine and Digest	Total		
Oct. 3	0.33	2.57	2.90	1.00	+1.90
" 4	0.97	—	0.97	2.65	-1.68
" 5	1.09	0.86	1.95	1.01	+0.94
" 6	1.07	—	1.07	1.08	-0.01
" 7	1.01	—	1.01	0.99	+0.02
" 8	1.01	—	1.01	0.97	+0.04
" 9	1.03	—	1.03	0.73	+0.30
	6.51	3.43	9.94	8.43	+1.51

TABLE VI.—Sulphur Partition in Urine

Date	Total S <sub>2</sub> (g.)	Total Sulphate S <sub>2</sub> (g.)	Neutral S <sub>2</sub> (g.)	% Neutral S <sub>2</sub>
Oct. 3	1.00	0.67	0.33	33.0
" 4	2.65	1.30	1.35	51.0
" 5	1.01	0.77	0.24	23.8
" 6	1.08	0.98	0.10	9.3
" 7	0.99	0.91	0.08	8.1
" 8	0.97	0.89	0.08	8.3
" 9	0.73	0.67	0.06	8.2

**Methods.**—Serum bilirubin estimations were carried out by Gibson and Goodrich's (1934) modification of van den Bergh's method. Non-protein nitrogen was determined in a Folin-Wu

filtrate of whole blood, as was the amino-nitrogen. The former determination was done by the method of Folin and Wu (1919), and the latter by van Slyke's method (1929). Blood cholesterol levels were determined by Leiboff's method (1924), the blood proteins by Andersch and Gibson's (1933) modification of Wu and Ling's method. Urinary nitrogen was determined by the Kjeldahl method, and the creatinine and "total creatinine" by the colorimetric method of Folin (1914). The total sulphates (inorganic plus ethereal sulphates) were estimated by the method of Folin (1905). Some difficulty was experienced in obtaining consistent results in total sulphur estimations until a method after Pirie (1932) was used. Estimations on each individual sample were repeated until a constant value was obtained. To check these results a pooled sample made from proportional parts of each daily sample was prepared and the sulphur content estimated. The final value obtained from the pooled sample was within 2% of the sum of the values from the individual samples.

#### Comment on Laboratory Investigations

The first abnormality revealed by the routine investigations was the rise in the serum bilirubin level between 12.30 p.m. and 6.30 p.m. on Oct 3—i.e., during the period when the liver was enlarging rapidly. Apart from the rise in blood amino-nitrogen at the end of the period of infusion and the transient appearance of urobilinogen on the day when relapse occurred, the routine investigations showed no other significant abnormality. It is of interest to note that the serum bilirubin on Nov. 2 had remained at the same level as on the day before discharge (Oct. 13).

In addition to these routine tests an attempt was made to follow the mode of action of methionine by estimating the nitrogen and sulphur balances of the patient and by determining the partition of the urinary sulphur between the oxidized (total sulphate) and unoxidized (neutral) fractions. It would appear from the balance figures that there was a nitrogen retention of 6 g. over the whole period. This may well be accounted for by nitrogen loss in the faeces. It should be noted, however, that on the 3rd and 4th there was a total negative balance of 7 g., which was almost eliminated by the sum of the positive balances of the 5th and 6th. While it is difficult to believe that the negative balance represents the rapid destruction of cellular elements followed by an equally rapid replacement, it may well be that on the 3rd and 4th the processes of protein synthesis in the liver were impaired, but returned to normal on the 5th and 6th and continued so during the rest of the period of observation.

The positive sulphur balance is, however, proportionately much greater. Even when a 5% error in estimated intake, a faecal loss of 10%, and an error of 2% in the total urinary sulphur estimations are deducted from the positive balance, there is still a small amount of sulphur unaccounted for. Since it is unlikely that all these factors operate at a maximum value and in the same direction the retention of sulphur is probably significant.

That the liver damage was in the nature of a metabolic derangement rather than an actual destruction of liver substance is indicated by the partition of the urinary sulphur. We have not yet followed the metabolism of large quantities of methionine given intravenously to normal individuals. Medes (1937), however, has shown that of 3.2 g. of *dl*-methionine given orally to normal individuals 95% is oxidized to sulphate and excreted in the urine within 24 hours, causing no appreciable rise in the unoxidized sulphur fraction. As it has also been shown by Martin and Thompson (1943) that amino-acids injected at the rate of 10 g. an hour do not spill over into the urine, it is safe to assume that a normal individual receiving the same treatment as our patient would have excreted in the urine the major portion of the methionine sulphur as oxidized (total sulphate) sulphur within 24 hours. The rate of injection of the solution used in our patient was almost identical with that quoted by Martin and Thompson. Our patient, however, excreted an excessive amount of unoxidized sulphur during the first two days, a quantity which was roughly equivalent to 65% of the amount of sulphur given therapeutically as methionine. While there is a possibility that some of the unoxidized sulphur excreted on the first day might be

due to spill-over into the urine, this cannot be true of that excreted on the second day. Moreover, a similar phenomenon was noted on the day of relapse, when the methionine was given orally. Thereafter the neutral sulphur fraction was within the usually accepted normal limits.

These considerations lead us to believe that the intimate cause of the liver disturbance induced by carbon tetrachloride is an abnormal metabolism of methionine and related compounds, and, moreover, that in our patient it was specifically the administration of methionine which prevented further liver damage. We hope to be able to determine the degree of permanent liver damage, if any, and the patient's response to large doses of methionine when he is readmitted to hospital for investigation at the end of six months.

#### Summary

The history of a case of acute carbon tetrachloride poisoning has been presented.

The patient was treated successfully by *dl*-methionine administered partly by infusion and partly by mouth.

An attempt has been made to follow the metabolism of the methionine administered.

We wish to express our thanks to Col. Middleton and Col. Hatcher, U.S. Army Medical Corps, for putting hospital and laboratory facilities in a U.S. Military Hospital at our disposal. We are grateful to Dr. M. Smith and Miss W. Watts for their assistance with the laboratory investigations, to Miss Eisendorff for superintending the dietetic work, and to the ward and laboratory staffs for their co-operation. We wish to thank the Research Department of British Colloids Ltd. for providing generous samples of casein digests suitable for intravenous injection.

#### REFERENCES

- Andersch, M., and Gibson, R. B. (1933). *J. lab. clin. Med.*, 18, 816.  
Folin, O. (1905). *J. biol. Chem.*, 1, 131.  
— (1911). *Ibid.*, 17, 469.  
— and Wu, H. (1919). *Ibid.*, 28, 81.  
Gibson, R. B., and Andersch, M. (1933). *Proc. Soc. exp. Biol., N.Y.*, 37, 413.  
— (1934). *Chem.*, 61, 177.  
— and Wason, E. M. (1940). *Med. Res. Cact. Sp. Rep. Ser.* No. 233.  
Martin, G. J., and Thompson, M. R. (1943). *Medicine*, 22, 73.  
Medes, G. (1937). *Biochem. J.*, 31, 1330.  
Miller, L. L., and Whipple, G. H. (1942). *J. exp. Med.*, 76, 421.  
Pirie, N. W. (1932). *Biochem. J.*, 26, 241.  
van Slyke, D. D. (1929). *J. biol. Chem.*, 83, 425.

## A CLINICAL EVALUATION OF SOME TESTS OF LIVER FUNCTION

BY

G. HIGGINS AND J. R. P. O'BRIEN  
Department of Biochemistry, University of Oxford

ALICE STEWART AND L. J. WITTS  
Nuffield Department of Clinical Medicine

(Radcliffe Infirmary, Oxford)

Before biochemical tests are accepted for the diagnosis or assessment of disease of the liver in man they should conform to certain conditions. First, it is essential to know the extent of the normal variations. To do this the tests must be applied to a large number of healthy men and women of different ages. Secondly, the tests should be applied in proved disease of the liver to show their sensitivity. To be satisfactory the results should differ materially from those found in the normal series. Detailed analysis might also reveal points by which one could distinguish between the various forms of liver disease and judge the severity of the liver damage. Thirdly, the tests should be applied in other diseases to show how specific they are.

Only when tests have been considered from these stand-points can they justifiably be applied to unselected clinical material. Although obvious, these criteria have often been ignored in the past, and even now are not fully appreciated. The number of observations on control cases is often small, and the worth of the tests in the diagnosis of disease of the liver is often open to doubt. Applied to cases in which the diagnosis is uncertain, they have given abnormal findings which have led to the assumption that the patient is suffering from disease of the liver. Then, by a familiar logical fallacy, it

is argued that the tests are good tests because they have revealed disease of the liver. In the work here presented a determined effort has been made to break this vicious circle and to put the first two conditions of validation on a sound statistical basis. Final proof of the exact specificity of the tests would include repeating them in every known disease. This is clearly impossible, but the tests have been done in a large group of miscellaneous diseases.

The biochemical investigations reported here are part of a much larger study of pigment metabolism (O'Brien, 1944), and only those immediately concerned with liver function are given. These are attempts to assess the efficiency of the liver in performing certain biochemical activities ascribed to it, and include tests to demonstrate the part it plays in carbohydrate metabolism and protein synthesis, and its ability to secrete, excrete, and detoxify certain organic compounds. The following estimations were made:

*Plasma Bilirubin*: Colorimetric (Thannhauser and Andersen, 1921)

*Plasma Phosphatase*: Colorimetric (King and Armstrong, 1934)

*Plasma Proteins*: Micro-Kjeldahl (Howe, 1921)

*Hippuric Acid Test*: Titration (Probstein and Londe, 1940)

*Modified Laevulose-tolerance Test*: Colorimetric (Higgins, O'Brien, and Stewart, 1942). The laevulose index is derived from this test.

100 individuals—50 males and 50 females between the ages of 18 and 50 years, all university students or laboratory personnel—were used as controls.

#### Diseases of the Liver

The patients studied comprised all suitable cases of disease of the liver admitted to the Radcliffe Infirmary during the past three years. Many of the patients were kept under continuous observation, and the tests were repeated during the course of the illness. The others were made the subject of a special follow-up investigation in the summer of 1943. Several of the patients who had recovered were re-examined some months after their discharge from hospital. Biochemical data were completely disregarded in making the diagnosis, which was founded on clinical criteria. The following diseases are represented:

*Secondary Carcinoma of the Liver (16 Cases)*.—The diagnosis was confirmed either at operation or at necropsy. For the purpose of statistical analysis two groups are recognized—one with intense jaundice due to extrahepatic obstruction (9 cases), and one in which there was no compression of the large bile ducts (7 cases).

*Acute Hepatitis (22 Cases)*.—These were all cases of acute parenchymatous disease of the liver in which the illness was of short duration. Fifteen were probably cases of infective hepatitis, and one developed jaundice after an operation for appendicitis and intensive sulphonamide therapy. There were five cases of post-arsphenamine jaundice, two cases of Weil's disease, one of which was fatal, and one fatal case of acute hepatitis of unknown aetiology. Post-mortem examination in the two fatal cases showed acute diffuse hepatitis with no residual scarring.

*Subacute Hepatitis (19 Cases)*.—These were cases of hepatitis with jaundice in which the illness lasted longer than two months. In every instance jaundice was the presenting sign, and investigation excluded the presence of gall-stones or neoplasm. Eight patients died, six showed complete clinical recovery at the time of the follow-up, and five were still suffering from recognizable liver disease. Post-mortem examination was made in all the fatal cases, and revealed massive necrosis with scarring and nodular hyperplasia.

Of the six patients who recovered two were cases of post-arsphenamine jaundice, one had been exposed to T.N.T., and three were probably cases of infective hepatitis.

Three of the eight patients who died had had previous attacks of jaundice, diagnosed at the time as infective hepatitis. One had worked in a laundry and handled trichlorethylene for a number of years. There was no clue to the aetiology in four of the cases.

The five patients who showed progressive disease of the liver but were alive at the time of the follow-up included one who had used carbon tetrachloride as a cleaning agent for many years. He had a

mild attack of jaundice while on holiday. He returned to work immediately afterwards, but continued to feel ill, and two months later the jaundice recurred. One patient dated his illness from an attack of jaundice that occurred during an epidemic of infective hepatitis, and he gave a definite history of contact at this time. There was no clue to the aetiology in three of the cases.

*Cirrhosis or Chronic Hepatitis (14 Cases)*.—The onset of the illness in this group was insidious and not marked by any recognizable clinical event. The disease either was discovered accidentally in the course of investigating other conditions or was first seen when symptoms of portal hypertension or terminal liver failure had developed. In every case the liver was inspected either by laparoscopy or laparotomy or at necropsy. One patient gave a history of syphilis and one had haemochromatosis. Both these patients died, and the diagnosis was confirmed post mortem. Three were chronic alcoholics, one of whom also took drugs. One had been treated for epilepsy with Fowler's solution for several years. Six of the fourteen patients died. The tests were repeated in six of the eight who were alive at the time of the follow-up. The essential pathological lesion in the fatal cases was diffuse periportal fibrosis with minimal parenchymatous hyperplasia.

The cases of subacute hepatitis that failed to recover often presented in the later stages of their illness a clinical picture which was indistinguishable from that of cirrhosis. We have used the presence or absence of jaundice early in the disease as the clinical distinction, but it is possible that there is no hard-and-fast line between these two groups. On the other hand, the subacute cases that recovered resembled the case of acute hepatitis in every respect except that the jaundice was more prolonged. The impression gained from the survey as a whole is that in diffuse hepatitis, as in glomerulo-tubular nephritis, every grade of chronicity exists, but for purposes of classification and statistical analysis the subdivision into acute subacute, and chronic hepatitis is convenient, and enables one to relate the biochemical abnormalities to the clinical course and prognosis.

#### Diseases of Other Systems

Investigations were made in 62 cases of illness other than disease of the liver. The following disease groups were represented:

	Cases		Cases
Anaemia .. .. .	18	Ulcerative colitis .. .. .	2
Secondary syphilis .. .. .	18	Type II nephritis .. .. .	2
Reitveldt's .. .. .	6	Hypertension .. .. .	2
Thyroiditis .. .. .	5	Myelomatosis .. .. .	1
Thyroiditis .. .. .	5	Polycythaemia .. .. .	1
Diabetes .. .. .	4	Arsenical dermatitis .. .. .	1
Peptic ulcer .. .. .	3	Lung abscess .. .. .	1
Ascites from other causes .. .. .	3		
Carcinoma .. .. .	3		

#### Results

The results from all three groups are summarized in Table I which gives the mean value and the standard error of the mean for each test. Table II gives a more detailed analysis of the tests in the liver diseases.

##### 1. Normal Controls

The complete battery of tests was done on every individual. This is one of the largest control groups for this series of tests yet reported, and should give reliable information regarding the range of values in the healthy adult population living under the wartime conditions of 1942. The results are being reported in detail elsewhere (Higgins and O'Brien, 1944).

##### 2. Disease of the Liver

*Plasma Bilirubin*.—Both the fatal cases of acute hepatitis were intensely jaundiced. This was also a feature in the early weeks of the illness in the more severe cases of acute and subacute hepatitis that eventually recovered. The last group contained two gravely ill patients in whom the bilirubin was over 20 mg. per 100 c.cm. when first seen. These bilirubin values cannot properly be compared with the ones found in the cases of subacute hepatitis that failed to recover, because these patients were often not sent to hospital until several months after the jaundice had first appeared. None of the cases of cirrhosis gave a history of a previous attack of jaundice, and even in the terminal stages of this disease a rise in the plasma bilirubin of more than 2 or 3 mg. was exceptional. As might be expected, there was intense bilirubinaemia

the cases of carcinoma with extrahepatic obstruction, and by moderate jaundice in those in which there was none.

**Plasma Phosphatase.**—The average value for the plasma phosphatase was above normal in each group. The two fatal cases of acute hepatitis gave values of 18 and 22 units respectively. In the cases of hepatitis that recovered the level of plasma phosphatase ranged from 10 to 54 units at the height of the illness, with a mean value of 24 units. In every case except one the level returned to normal when the patient recovered. The exception was a boy with subacute hepatitis. His plasma phosphatase was still 35 units six months after the beginning of the illness. Variable results were obtained

the thirteen cases in this group had more than 2.8 g. % albumin when first seen, and six of the eight fatal cases gave terminal values of less than 2 g. %. Three of the five cases that were still alive had just over 3 g. % albumin when last seen.

Low values were also found in the patients with cirrhosis, but three of the fourteen cases had more than 3.5 g. % albumin when first seen. These three patients were alive and well at the time of the follow-up. Only one patient had less than 2 g. % albumin, and he died within a month. In both types of carcinoma of the liver the plasma albumin was subnormal, and ranged from 3 to 4 g. %.

The fall in the plasma albumin was accompanied by a rise in the plasma globulin in many cases of hepatitis. In one of the fatal cases of acute hepatitis and in thirteen of the acute and subacute

TABLE I.—Liver Function Tests in 100 Controls, 71 Cases of Liver Disease, and 62 Cases of Other Diseases

	No. of Cases	Bilirubin (mg./100 c.cm.)	Phosphatase (units)	Plasma Proteins (g. %)			Hippuric Acid (% excretion)		Laevulose Index
				Total	Albumin	Globulin	2 Hours	4 Hours	
Controls	100	0.5 ± 0.33	8 ± 2.0	7.1 ± 0.38	4.6 ± 0.29	2.2 ± 0.35	59 ± 9.2	88 ± 6.1	11 ± 1.15
Liver diseases	71	8.4 ± 3.46	33 ± 2.52	6.8 ± 0.12	3.2 ± 0.09	3.2 ± 0.13	35 ± 1.7	62 ± 1.7	27 ± 1.60
Other diseases	62	0.64 ± 0.05	12.4 ± 1.44	6.7 ± 0.11	4.0 ± 0.08	2.3 ± 0.09	55 ± 1.8	80 ± 1.4	13.8 ± 0.35

In this and the following table the mean values and the standard error of the means are shown for each test. The laevulose index is the sum of the maximum value blood laevulose plus the value at 24 hours after ingestion of 100 g. sucrose.

TABLE II.—Liver Function Tests in 55 Cases of Hepatitis and 16 Cases of Secondary Carcinoma of the Liver

				No. of Cases	Bilirubin (mg./100 c.cm.)	Phosphatase (units)	Plasma Proteins (g. %)			Hippuric Acid (% Excretion)		Laevulose Index
							Total	Albumin	Globulin	2 Hours	4 Hours	
acute hepatitis	Fatal .. .. (a)	2	33.5 ± 4.9	20 ± 9.9	7.0 ± 2.8	3.4 ± 0.14	3.1 ± 1.3	—	—	—		
	Recovered .. .. { (a) (b)	20 12	7.0 ± 0.98 0.5 ± 0.03	24 ± 2.4 10 ± 1.5	6.8 ± 0.14 7.3 ± 0.25	3.5 ± 0.12 4.4 ± 0.10	2.9 ± 0.15 2.6 ± 0.12	43 ± 2.1 54 ± 6.6	68 ± 2.9 83 ± 2.9	19 ± 0.59 14 ± 1.4		
subacute hepatitis	Recovered .. .. { (a) (b)	6	12.2 ± 3.9 0.75 ± 0.41	24 ± 1.0 12 ± 4.7	7.0 ± 0.2 7.2 ± 0.2	3.5 ± 0.23 4.5 ± 0.14	3.1 ± 0.2 2.7 ± 0.14	37 ± 5.3 57 ± 4.1	63 ± 7.5 85 ± 2.8	27 ± 2.8 14 ± 1.8		
	Residual liver disease { (c)	5	12.5 ± 4.8 2.5 ± 0.57	42 ± 10.0 31 ± 6.2	7.3 ± 0.56 7.8 ± 0.55	2.8 ± 0.52 3.2 ± 0.14	4.4 ± 0.49 4.3 ± 0.59	27 ± 1.3	59 ± 2.2	29 ± 4.4		
	Fatal .. .. { (a) (d)	8 7	6.1 ± 2.1 3.9 ± 1.7	18 ± 3.3 23 ± 4.2	7.3 ± 0.73 7.8 ± 0.55	2.3 ± 0.18 1.6 ± 0.12	4.7 ± 0.6 6.0 ± 0.48	26 ± 2.9 29 ± 4.2	52 ± 5.1 58 ± 8.6	36 ± 4.7 43 ± 3.7		
	rhosis .. .. { (a) (e)	14 6	1.3 ± 0.28 1.9 ± 0.52	36 ± 1.7 43 ± 8.3	6.7 ± 0.27 6.8 ± 0.56	3.1 ± 0.18 3.0 ± 0.31	3.3 ± 0.21 3.5 ± 0.6	32 ± 4.6 32 ± 7.0	66 ± 4.9 69 ± 9.1	35 ± 3.2 38 ± 8.5		
carcinoma	with extrahepatic obstruction .. ..	9	20.1 ± 2.9 1.9 ± 0.4	62 ± 8.0 37 ± 7.4	6.4 ± 0.04 6.1 ± 0.32	3.4 ± 0.03 3.5 ± 0.12	2.3 ± 0.03 2.3 ± 0.2	29 ± 2.6 38 ± 1.9	64 ± 3.8 63 ± 3.0	24 ± 6.5 24 ± 3.2		

(a) When first seen. (b) After recovery. (c) 3 to 8 months later. (d) Within 1 month of death. (e) 9 months to 2 years later.

the cases of subacute hepatitis that failed to recover. The average value was 26 units, but there was a wide scatter and close correlation between the level of the plasma phosphatase and the clinical condition. In six of the thirteen cases it was low 20 units when first seen, and low values were found in the terminal stages of three of the fatal cases. Four cases of cirrhosis gave values of less than 20 units when first seen, but the average value, 36 units, was much higher than in the other types of hepatitis. When the tests were repeated at the time of the follow-up only one case of cirrhosis gave a value of less than 40 units. In the cases of carcinoma of the liver with extrahepatic obstruction the plasma phosphatase was usually higher than in any other group, ranged from 20 to 96 units, with an average value of 62 units. In the cases of carcinoma without extrahepatic obstruction the average value was 37 units, with a range from 10 to 80 units.

**Plasma Proteins.**—Changes in the plasma proteins occurred in each group, and in the cases of hepatitis in which the illness lasted more than two months a close correlation was observed between the fall in the albumin and the extent of liver damage. Where the latter was greatest, as in the fatal cases of subacute hepatitis, there was also a remarkable rise in the plasma globulin.

The two fatal cases of acute hepatitis had 3.5 and 3.3 g. % albumin. Twenty of the twenty-four cases of acute and subacute hepatitis that recovered had less than 4 g. %. Only four had less than 3 g. %.

The plasma albumin was lowest in the cases of subacute hepatitis that failed to recover. It became still lower as the clinical condition deteriorated, but improved during a remission. Only one of

cases that recovered the globulin was over 3 g. %. In spite of this, in eleven cases of acute hepatitis and in four cases of subacute hepatitis that recovered the total protein was less than 7 g. %.

In the cases of subacute hepatitis with progressive disease of the liver there was usually a remarkable rise in the plasma globulin, which became still greater as the disease advanced. Only one of the fatal cases had less than 3.7 g. % globulin in the terminal stage of the illness. The increase in the globulin was often responsible for a rise in the total protein, and in seven cases this was over 8 g. %. The highest globulin values recorded were 7.2 and 7.7 g. %, the corresponding total protein being 9.2 and 9.8 g. %.

The rise in the plasma globulin was less striking in cirrhosis than in the fatal cases of subacute hepatitis, but ten patients had over 3.2 g. %. The total protein was less than 6.8 g. % in ten cases and over 8.8 g. % in two cases. The six patients re-examined during the follow-up showed a greater change in the albumin-globulin ratio than was observed when they were first seen.

The globulin was usually not increased in carcinoma. In only one instance was it over 3 g. %, and in other cases it ranged between 1.7 and 2.4 g. %. The total protein was less than 6.7 g. % in every case except one.

**Hippuric Acid Excretion.**—In each group the average value for the amount of hippuric acid excretion was subnormal, but there was a wide variation in the individual figures and no close correlation between the amount excreted and the severity or duration of the illness. There was no reliable distinction between the different disease groups. The average two-hourly excretion was slightly lower in the cases of cirrhosis and subacute hepatitis with progressive disease of the liver than in the cases of hepatitis that recovered, and lower in the cases of carcinoma with extrahepatic obstruction than in those without, but there was no difference in the average value for the amount excreted in four hours. Hippuric acid excretion



faced in an upper compartment with connecting flues. Ingley (1943) has lately constructed and used a similar refrigerator.

If the rationale of this treatment be accepted, frost-bite casualties on arrival at a C.C.S. or base medical unit should have the affected limbs inserted in a cooling cabinet, where they would remain until the circulation had been re-established and the greater part of the oedema had disappeared. During this period the temperature of the cabinet could be gradually increased daily until it reached room temperature. The length of time required for this "controlled thawing" would be several days, depending on the severity of the lesion.

### Extremity Wounds, with Impaired Blood Supply

In an extremity in which the wound or injury has impaired the blood supply sufficiently to produce a danger of ischaemic gangrene one has a fundamentally similar problem. The ischaemia which is responsible for the oxygen deficit in the tissues may be due to ligation of main arteries, destruction of collateral branches, or intense swelling and oedema exerting pressure in fascial compartments and hindering the normal transfer of oxygen to the tissues.

To refrigerate the distal extremity of limbs with dangerously impaired blood supply, from whatever cause, appears perfectly reasonable. By so doing one lowers the metabolic requirements of the endangered tissues until such time as the collateral circulation has been established and swelling has subsided. It has been proved experimentally (Brooks and Duncan, 1940; Allen, 1941) that the ischaemic limb or tail of an animal survives a great deal longer when treated by dry cold than when left at room temperature. Allen also observes that the cold apparently inhibits blood-clotting and thrombosis, and he has demonstrated clinically that it prevents the coagulation of exudate in wound margins, thus facilitating drainage while retarding healing. Further benefits from cold therapy would be the relief from pain and the inhibition of any infective process that may be present in the affected part until such time as an improved blood supply might deal with it more effectively.

It may be argued that cold applied to the limb will induce a degree of arterial spasm and thus hinder the development of a collateral circulation. Very low temperatures, however, need not be used, and any tendency to vasospasm could be offset by coincident anaesthesia of the sympathetic nerve supply, heat applied to the other limbs, or vasodilator drugs. It is also possible that some phase of the biochemical process of tissue oxidation may be inhibited by too low a temperature, and in such an instance cold therapy could conceivably be helpful. If this is the case some form of temperature regulation is necessary.

The above experimental and clinical observations, based on apparently sound theory, should warrant investigation into the treatment of limb extremities, in certain types of wounds, by dry cooling and a gradual return to room temperature.

### Traumatic Arterial Spasm

Increasing attention has been paid by surgeons recently to the occurrence of an arterial spasm associated with some wounds and fractures of the extremities (Cohen, 1940; Griffiths, 1940; Barnes and Fructa, 1942; MacFarlane, 1942). In such cases there is a history of trauma to the artery, which on exposure may or may not reveal any obvious evidence of damage. The resultant spasm has been shown experimentally (Barnes and Fructa, 1942) and clinically by these investigators to involve in most cases the entire vascular tree of the limb, and leads sometimes to gangrene. Griffiths has recently concluded that Volkmann's ischaemic contracture "is due to arterial injury and to the accompanying spasm of the arterial circulation." The pathology of the muscle necrosis in this condition and so-called traumatic arterial spasm has been observed to be similar (MacFarlane, 1942).

Cold therapy has already been considered and used by Canadian Army surgeons for traumatic arterial spasm. Again it must be remembered that cold in itself produces certain degrees of arterial spasm, and only further investigation will prove that in the balance greater benefit is conferred by its ability to lower the metabolic requirements of the tissues.

Acting on this latter assumption, however, these limbs can be refrigerated as an adjunct to the specific forms of therapy already recommended, such as surgical exposure of the artery, sympathectomy, arteriectomy, and the use of vasodilators. Since it has been observed that this spasm sometimes disappears spontaneously after a few days with the return of arterial pulse, cold therapy could be used as part of the conservative therapy routine provided no undue compression of the artery is considered likely to exist.

### Peripheral Embolism

Acting on the same principle, and already suggested by Allen, dry cooling of a limb in which there has been an embolic blockage of its blood supply would enable the tissues to carry on at a reduced metabolic rate until the establishment of an improved circulation. Whether in conjunction with embolectomy or other lines of conservative treatment, tissue vitality would theoretically be retained during the time required for relief of the associated vasospasm or the development of a collateral circulation.

### Description of Unit

The unit (Figs. 1-3) has been designed to accommodate two limbs if necessary. The cabinet or limb unit is cooled by cold brine, which circulates through coils in the wall, the

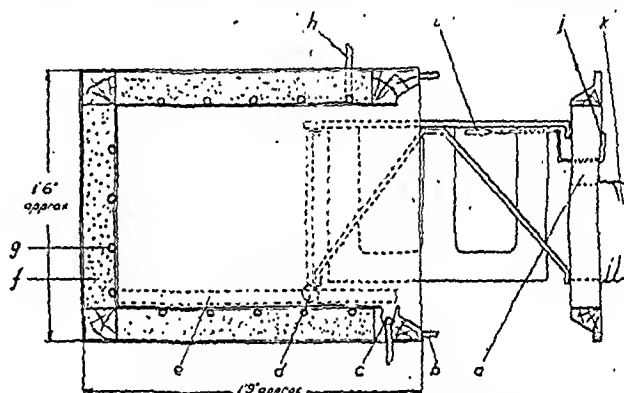


FIG. 1.—Side view of limb cabinet. *a*, Front panel with frame and slings attached. *b*, Studs for securing front panel. *c*, Trough with drain for condensate. *d*, Castors on front of frame. *e*, Guide for castors. *f*, Cork insulation. *g*, Brine pipes soldered to inner walls. *h*, Brine return pipe. *i*, Thermometer bulb. *j*, Thermometer dial. *k*, Canvas sleeve. *l*, Holes in front panel for entry of limbs. *m*, Brine-flow regulating valve. *n*, Hose union for brine pipe from reservoir.

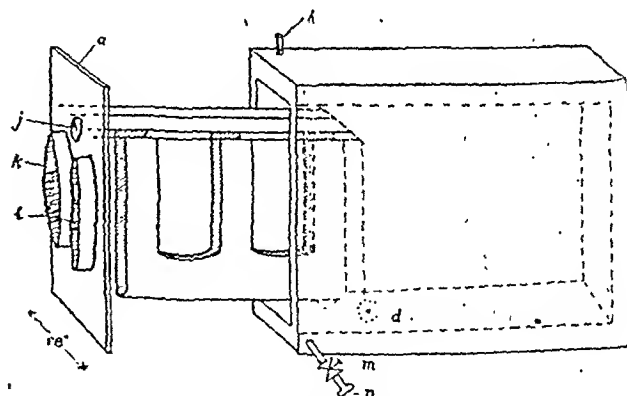


FIG. 2.—Perspective of limb cabinet, showing one canvas sling. (For explanation of lettering see Fig. 1.)

temperature of the cabinet being regulated by merely adjusting the rate of flow of cold brine, using a stopcock and thermometer, conveniently placed for the patient to do his own adjusting.\* The slings for the limbs are suspended from

\* This method was used satisfactorily on the experimental model, but it has since been determined that it would be possible to have an automatic valve made which would pass just the requisite amount of brine to maintain the cabinet at any predetermined temperature. The whole equipment would thus be independent of any manual control.

a metal framework which is integral with the front panel. Thus by detaching the front panel the limbs can be withdrawn for observation or dressings with a minimum of trauma and without disturbing their position in the slings. This operation is facilitated by the provision of castors on the far end of the frame running in guides on the floor of the cabinet.

The brine circulating in the limb cabinet is cooled in a reservoir to a predetermined temperature by a separate refrigerating machine and pumped to the limb cabinet through a flexible tube. Several limb cabinets can be attached to the brine supply at one time, thus allowing treatment of more than one patient, and by adjusting the stopcocks (previously described) on the limb cabinets it is possible, if necessary, to maintain different temperatures in each of the cabinets.

The actual refrigerating machine with brine reservoir would be a mobile unit mounted on a trolley and operated entirely by electricity. Its essential components would be a small compressor operated by an electric motor, an air-cooled condenser, and an automatic expansion valve for regulating the flow of refrigerant. The brine reservoir

vaporized would be pumped out by the compressor and recondensed in the air-cooled condenser. The brine could be kept within  $2^{\circ}\text{C}$  of any desired temperature by means of a thermostat, which would automatically start and stop the electric motor driving the compressor. The cooled brine would be taken from the reservoir by a small electrically driven centrifugal pump, and circulated to the various units by way of a manifold and flexible hoses, returning afterwards to the reservoir for re-cooling. It is estimated that the dimensions of a complete refrigerating unit as described, and capable of operating up to four limb cabinets, would not exceed 2 ft. 6 in. by 2 ft. 6 in. by 2 ft. 3 in.

The cabinet described can be operated over a very wide range of temperature. It has been determined experimentally that in order to maintain a cabinet temperature of  $4^{\circ}\text{C}$ . to  $6^{\circ}\text{C}$ . the brine circulating need only be  $0^{\circ}\text{C}$ . to  $-2^{\circ}\text{C}$ . Therefore, by lowering the temperature of the brine reservoir, which is done by adjustment of a thermostat, temperatures well below freezing-point could be maintained in the cabinet.

The working model constructed by one of us (Lanyon) for investigation has a small limb cabinet capable of accommodating a hand and lower forearm (see photographs, Fig. 3). Observations made on an empty cabinet and again with a normal limb inserted proved the ability of the cabinet to assume any given temperature and to maintain this temperature with the minimum of adjustment. Dermatherm readings, to record the resultant changes in skin temperatures, made by attaching a thermocouple to the dorsum of the hand, showed coincident variation of skin temperatures (see Graph). With such an apparatus, cabinet temperatures from  $4^{\circ}\text{C}$ . to room temperature were obtained. After two hours' exposure at a cabinet temperature around  $12^{\circ}\text{C}$ . the limb appears to be completely chilled, evidence of this being the subjective numbness and the fact that it takes several hours for the skin temperature to return to normal after removal from the cabinet.

### Summary

A description is given of a refrigerating device to investigate the dry cold treatment of frost-bite, traumatic arterial spasm, peripheral embolism, and certain wounds of the extremities.

Observations made on a working model have proved it capable of providing the conditions necessary for such treatment.

The apparatus is simple, portable, and flexible in operation, and has been designed primarily to meet the requirements of an army in the field.

We acknowledge with thanks the helpful advice of Lieut.-Col. E. H. Botterell, Basingstoke Neurological and Plastic Surgery Hospital, and the facilities provided by the Officer Commanding Army Blood Supply Depot for carrying out the experimental work.

### REFERENCES

- Allen, F. M. (1941). *Amer. J. Surg.*, 52, 225 (see Bibliography).  
Bancroft, F. W., Fuller, A. G., and Ruggiero, W. F. (1942). *Ann. Surg.*, 115, 621.  
Barnes, J. M., and Trueta, J. (1942). *Brit. J. Surg.*, 30, 74.  
Bigelow, W. G. (1942). *Canad. med. Ass. J.*, 47, 529.  
Brooks, B., and Duncan, G. W. (1940). *Ann. Surg.*, 112, 130.  
Cohen, S. M. (1940). *Guy's Hosp. Rep.*, 90, 201.  
Greene, R. (1941). *Lancet*, 2, 659.  
— (1942). *Ibid.*, 2, 695.  
Griffiths, D. L. (1940). *Brit. J. Surg.*, 28, 239.  
Kreyburg, L., and Rotnes, L. (1932). *Acta path. microbiol. scand.*, Supp., 11, 162.  
Lewis, Sir T. (1941). *British Medical Journal*, 2, 795.  
MacFarlane, J. A. (1942). *J. Bone Jt. Surg.*, 24, 759.  
Ungley, C. C. (1943). *Lancet*, 1, 631.  
— and Blackwood, W. (1942). *Ibid.*, 2, 447.  
Webster, D. R., Woolhouse, F. M., and Johnston, J. L. (1942). *J. Bone Jt. Surg.*, 24, 785.

A new decree has been issued in Rumania which states that everyone with venereal disease must undergo treatment, and premarital certification of freedom from infection is obligatory. Physicians must report defaulting patients. Persons exposed to risk through their profession—e.g., those serving in hotels, restaurants, night clubs, public baths, as well as pedlars and street vendors—are subject to periodic examinations. Correctional imprisonment of 1 to 3 years is imposed on clandestine prostitutes and proprietors of hotels who allow prostitution on their premises. Knowing transmission of the disease to others carries a sentence of 1 to 5 years' correctional imprisonment and a fine of 50,000 to 200,000 lei. . . . Persons undergoing medical treatment at the time of transmission of the disease will be severely punished without the application of extenuating circumstances. Free blood tests are made by the State. Brothels are again permitted by law.

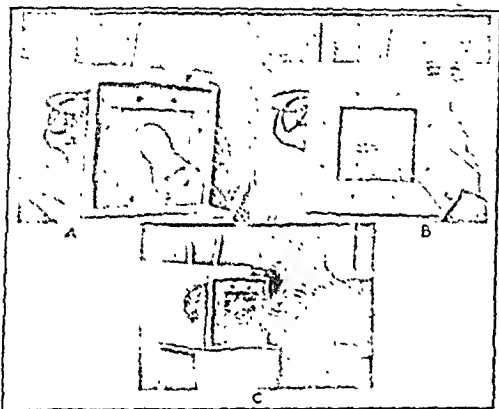


FIG. 3.—The experimental cabinet. A, View of cabinet with front in position. B, Front removed, showing rest for hand. C, Patient's forearm in position. (The thermometers shown were used in making experimental observations.)

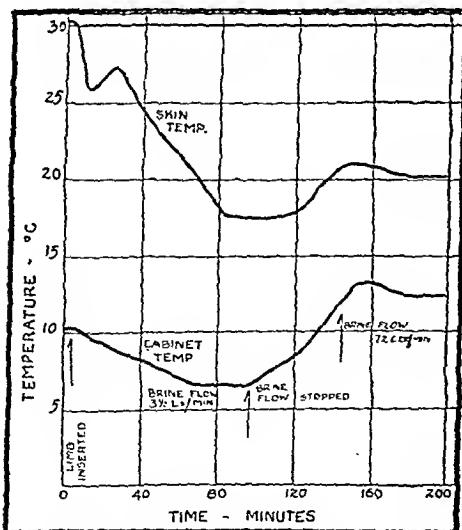


FIG. 4.—Graph showing record of cabinet and skin temperatures (June, 1943).

would be mounted alongside the machine, and would consist of an insulated tank with a suitable coil of cooling pipe immersed in the brine. This coil would be cooled by admission of liquid refrigerant through the expansion valve; the refrigerant when

## AETIOLOGY OF "IMMERSION FOOT"

BY

B. W. GOLDSTONE, M.B., B.Sc., F.R.C.S.Ed.

Major, R.A.M.C.

AND

H. V. CORBETT, M.D., M.Sc., M.M.S.A., D.R.C.O.G.

Major, R.A.M.C.

Shipwrecked men adrift on rafts, at times half covered with sea-water, are subject to the lesions of "immersion foot" and "immersion hand." The war has obviously caused a great increase in the number of these cases, yet the clinical descriptions available were scanty until Ungley and Blackwood (1942) published their careful observations. We have now seen four parties of men rescued after many days at sea in a half-soaked state. These cases showed features that surprised us; especially the fact that the lesions had occurred at a time when the temperature never reached freezing-point, and in one instance during the summer. This was contrary to all our preconceived ideas of the lesion, which was previously assumed to be similar to a slow frost-bite. Our purpose in this paper is (i) to confirm the clinical picture as established by Ungley and Blackwood (1942); (ii) to present a conception of its aetiology; (iii) to describe a remarkable complication.

There were four parties of rescued men. The numbers were respectively 9, 1, 1, and 10. Nearly all showed roughly the following syndrome, some having interesting complications which will be described afterwards.

## Swollen Stage

This stage was present soon after they were taken from the water. The hands and feet were greatly swollen and the skin was shiny. The extremities showed muscular paresis and there was complete anaesthesia both of hands and of feet; in some cases the anaesthesia extended as high as the middle of the lower leg. Pain was not a marked feature at this stage. There was pyrexia for a few days.

## Stage of Diminishing Oedema

After about a week the hands and feet shrank. The skin was no longer shiny, but wrinkled and dull; anaesthesia was passing off, though it was still present at the extreme distal parts—e.g., soles of feet. Paraesthesiae were present; these ranged from mere pins-and-needles to agonizing pains which prevented sleep for many nights. These pains often continued for several weeks with diminishing severity. Frequently there was so much tenderness that the patient could not bear the weight of the sheets upon his toes. Even when the lower leg bore no outward mark of any lesion, there was often agonizing pain on pressure at the lower part of the calf and tendo Achillis, and the ankle-jerks were diminished or absent.

It will be seen that the whole clinical picture bears a pronounced resemblance to a condition of peripheral neuritis. The muscular paresis, the anaesthesia, the agonizing pains, and the frequent absence of reflexes all help to build up this resemblance. Throughout this stage the feet are warm and the pulsation of the dorsalis and posterior tibial arteries is good.

## Complications

**Gangrene.** In the first party of 9 cases gangrene did not occur. It was seen in the third party. In this one case the man had drifted for 15 days, in summer weather, with his feet partially immersed, and gangrene of the fore part of the feet and of the heels occurred. We saw this case only at a very late stage, by the kindness of Mr. McIndoe. There had certainly been gangrene; according to the patient's own statement, tingling followed by numbness began on the third or fourth day, and thereafter he noticed the gradual onset of blackness of the feet. There was no pain, but he was aware of what was happening. Gangrene probably became certain about the seventh or eighth day. The fourth party—10 men—had been waterlogged for 50 hours in very mild weather. Of these, one man had only slight superficial gangrene of the skin of the knuckles on one hand. This hand had been continually grasping a rope of the raft without letting go. It was quite obvious that the gangrenous patches corresponded to the whitening of the knuckles (and consequent ischaemia) that would result from the continual clutching. We feel that gangrene is not an essential or even a common feature of the typical lesion, and would appear to occur under exceptional conditions which would kill any normal man long before the onset of foot gangrene.

**Skin-water Rash.** This occurred in two of the cases. It consisted of minute boils spread over the skin. It appeared only on the chest, and we have not yet seen it in relation to the typical lesion of immersion foot. Its interest lies in the manner in which the toxic

action of the salt water on the skin is shown in its fullest form—as apart from the action of cold.

**Duodenitis.**—We do not know how common this complication is, but as it certainly occurred in one, and possibly two, of our series, we shall describe it. The first patient, about a week after his rescue, began to pass altered blood and then bright blood per rectum. He rapidly became exsanguinated. A diagnosis of possible bleeding duodenal ulcer was made, although no previous history of ulcer could be obtained. His condition gradually became worse, and in spite of transfusions he died. The following is an extract of the necropsy report:

"The stomach contained a little mucoid fluid and had pale walls. The whole of the small intestine and much of the colon were filled with a dark tarry faecal material. There was no tumour or ulcer visible in the wall, but the whole of the duodenum was deeply engorged and oedematous—obviously the origin of the fatal haemorrhage. The liver weighed 70 oz. and had a smooth grey surface. The substance was soft, and showed bile staining around many of the intrahepatic channels. The kidneys weighed 11 oz. Their capsules stripped from a smooth pale surface. On section, differentiation of structure was poor and there was some cloudy swelling. . . . In my opinion the cause of death was: (a) small-intestinal haemorrhage; (b) acute toxic hepatitis and nephritis; (c) chilling of both legs from prolonged immersion."

The second patient, apart from any leading questions, complained of fairly severe epigastric pain 1½ to 2 hours after meals. He had never before had dyspepsia, and the type of his pain is suggestive of duodenitis.

## Discussion

Greene (1941) stated: "I gather that clinically it [immersion foot] is almost identical with trench foot." He also stated that "trench foot is almost identical with gradual frost-bite." We wish to draw a clear distinction between the two conditions (frost-bite and immersion foot) for the following reasons:

Lewis and Love (1926) have shown that very probably the essential feature in production of frost-bite is actual freezing of the skin. They demonstrated that if the freezing-point of the skin could be depressed (as by inunction with oil) it would be relatively protected from frost-bite. They showed, in fact, that it would need to fall to  $-2.2^{\circ}$  C. at least for the skin to freeze. In the evolution of our cases the temperature never fell below zero, according to the cases at our disposal. We stress this point because a clear-cut phenomenon like freezing most probably changes the living cell immediately; its metabolism would cease, and its membrane must run the risk of bursting by reason of the sudden formation of ice within it. As Lewis and Love (1926) state, "The hardening and firm union of [ice] crystals, at first separate, is an event especially calculated to produce cellular damage, and it is to cellular damage that the after-effects must be ascribed, for they are in all respects similar to those produced by mechanical injuries delivered from outside—for example, the lash of a whip."

The aetiology of immersion foot is a gradual chilling, never frost. This chilling produces a vicious circle when the familiar protective reflex of local arteriolar spasm is superadded. Thus all tissues soon begin to suffer from a combined insult—cold and relative ischaemia. The weakest tissue would suffer most. It is logical to suppose that the biologically most delicate tissue would show the lesion first. Nerve tissue is probably the most delicate, hence the syndrome of peripheral neuritis is the predominant clinical feature. Support for this view is especially furnished by two of the cases. In both of these the tissue of the lower leg revealed no sign of skin damage, yet both showed signs of peripheral neuritis; one had anaesthesia of the lower calf, and the other great tenderness on deep pressure of the calf and an absent ankle-jerk. Since originally writing this we have read Ungley and Blackwood's (1942) paper. Their microscopical observations on post-mortem material confirm this point—namely, that Wallerian degeneration was the outstanding lesion.

It is obvious that if the chilling process is sufficiently prolonged the metabolic handicap would become intolerable to each tissue in turn. Thus each tissue, in the order of its strength, would successively fail in its function, then die. Finally, the lowest and most tolerant of all tissue (connective tissue and tendon) would fail to survive the more organized tissues. The whole part would then be gangrenous, as in the case of one of our patients who was 15 days on a waterlogged dinghy. Probably few men could survive this long test, and gangrene is therefore a rare occurrence in the disease of

immersion foot. Is cold, then, directly the major factor in the metabolic handicap, or is the relative ischaemia—an indirect result of the cold—principally responsible for the lesion? Both views are considered by Ungley and Blackwood (1942), who fully discuss the two theories. It seems more probable that ischaemia is the responsible agent.

The aetiology of frost-bite is quite different. In its purest and most dramatic form it occurs suddenly, as in the case of Greene's (1940) experience with a camera shutter. He states: "The contact of a momentarily ungloved finger with the button of a camera in a high wind at a temperature below zero Fahrenheit and at a height of about 25,000 ft. once cost me a finger-tip." Here we have a sudden mechanical accident. It produces the familiar appearance (like a localized infarct) of frost-bite. Within this area all tissues, irrespective of their biological resistance, are dead. In the mechanical explosion the strong have perished with the weak.

Of course there must be mentioned forms in which frost-bite becomes superadded to immersion foot. We have never seen trench foot, but in this there would be an opportunity for a combination of the two syndromes: a succession of rain, mud, and slush would give the prolonged chilling sufficient for the development of immersion foot; and, as Lewis and Love (1926) have shown, by the washing away of skin oils would, with the advent of frost, predispose the tissues to the development of frost-bite if the temperature suddenly fell below freezing-point.

### Other Complications

**Salt-water Boils.**—It might be objected that the syndrome we describe could have been caused by either the chemical or the osmotic action of the sea-water and not by the chilling effect. However, the location of salt-water boils on the chest in two of our cases should answer this objection. The chest, by reason of its rich blood supply and high mass-surface ratio, is not liable to cooling, and would therefore show a pure result of toxic action as apart from chilling. With regard to osmotic action, sea-water is about 21 times as strong osmotically as human tissues. No osmotic action could have occurred through the skin, otherwise the tissues would have shrunk and not swollen.

**Duodenitis.**—Nearly all our patients had pyrexia in the early stages; they were not infected. This must have been non-specific traumatic fever, caused by the absorption of toxins from traumatized areas. Curling's ulcer of the duodenum occurs as a result of absorption of toxins from burnt areas. The similar aetiology of Curling's ulcer and our case of duodenitis is certainly striking, but it would be beyond the scope of this paper to speculate on the mechanism of this duodenitis.

### Treatment

From time immemorial the danger of rapidly warming frost-bitten areas has been recognized. Greene (1942) has given a scientific basis to this idea by freezing a rat's tail and then thawing it in front of a fire. This caused the loss of nearly twice the tissue that would otherwise have occurred. Smith, Ritchie, and Dawson (quoted by Greene, 1940) suggest that it may be due to rupture of capillaries previously damaged by frost. Lewis and Love (1926) suggest that the presence of histamine-like substances causes an excessive and dangerous transudation.

It might be thought that these considerations were not specially applicable to cases of immersion foot. But Ungley and Blackwood (1942) sound a word of warning against the use of heat. They quote the experiment of Allen on chilled ischaemic rats' tails. These survived much longer than the unchilled controls. He suggests, therefore, that in a recent case of immersion foot it is dangerous to warm the part before circulation has returned: warmth raises its metabolism to a point beyond the capacity of the feeble circulation to supply it. Thus the tissues are rapidly brought to a state of metabolic bankruptcy, and necrosis occurs.

It should be noted that the theoretical objections to warmth in the treatment of frost-bite are based on the vasodilator effect of heat.

We refer again to Lewis and Love's experiment in which vesicle formation on warming a frost-bitten part was minimized

by compressing the main limb artery. Smith, Ritchie, and Dawson (quoted by Ungley and Blackwood, 1942) stated that actual rupture of frost-bitten capillaries occurred with too forceful vasodilatation. The objection to heat in cases of immersion foot, however, is somewhat different. The rise of temperature is considered undesirable because it raises the metabolic rate of the tissues out of proportion to their diminished blood supply. Therefore an increased vasodilatation, undesirable though it may be in frost-bite, is appropriate here. In this way the blood supply is adequately increased to keep pace with the enhanced metabolism.

There would here seem to be a field for the cautious simultaneous use of two separate elements in treatment. (1) local application of cool air to the damaged feet; (2) measures for active local vasodilatation. A mild type of local vasodilatation could be obtained by warmth applied to the whole body while the damaged feet were simultaneously kept cool to maintain the low metabolism. The French school have practised more intense measures for obtaining vasodilatation in the affected feet: the lumbar sympathetic chain is injected with a local anaesthetic. Stricker and Buck (1940) give a detailed report of two cases in which this treatment was carried out. They claim an immediate and remarkable improvement in the damaged limb; it becomes warmer, less dusky, and much less painful. Unfortunately, in their cases they make no clear distinction between trench or immersion foot and frost-bite. It should be noted that they started their treatment one day after rescue. English opinion is at present against measures for active vasodilatation; and, indeed, the average mild case will get better with the general treatment advocated. But with really severe cases it may be worth while cautiously to try the combination suggested by these theoretical considerations. We have not yet had the opportunity. After the first few days of illness most of our patients were allowed a heat-craddle to their feet. When the pain became severe they begged for the cradle; it relieved the pain.

In cases of older people with a weakened detoxicating action of the liver it would certainly seem worth while to prevent erosion of the duodenum by placing them on a peptic ulcer regime for about a week. The parietic condition of the feet should also receive consideration: with weakened neuromuscular apparatus in the foot, there is also the danger of acute flat-foot. Patients should not be allowed to bear weight too early, and severe cases should receive faradization and special exercises to the foot muscles as a preliminary to walking.

### Summary

The syndrome of immersion foot is described. Commonly it bears a striking resemblance to peripheral neuritis.

It appears that the disease may be regarded as a massive chilling and ischaemia of all the various tissues in the foot or hand. These are successively affected in the inverse order of their biological fortitude. Thus the clinical picture may vary from a mere peripheral neuritis to the rare stage of gangrene. Most patients are rescued in the stage of skin and nerve damage. They would probably rarely survive to reach the stage of gangrene, but one case of gangrene is described.

The syndrome is in sharp contrast to that of frost-bite, in which by reason of a mechanical accident (ice-crystal formation) all tissues involved in the area suffer simultaneous death irrespective of their relative hardiness.

Treatment of the two diseases is not the same: measures for active vasodilatation are under certain circumstances indicated in immersion foot, but are dangerous in frost-bite. However, both types of lesion should be kept cool in their early stages.

Mixed forms of the two diseases are postulated.

The complication of duodenitis with duodenal haemorrhage is described. It is suggested that this may be due to the absorption of toxins from the damaged area. The similarity with Curling's duodenal ulcer in burnt patients is noted.

We wish to acknowledge the help and kindly criticism of Mr. A. H. McIndoe. Our thanks are also due to Dr. E. T. Ruston, who carried out the post-mortem examination, and to the coroner for East Surrey for his kind permission to publish extracts of the necropsy report.

### REFERENCES

- Greene, R. (1940). *Lancet*, 1, 303.  
— (1941). *Ibid.*, 1, 689.  
— (1942). *Ibid.*, 2, 695.  
Lewis, T., and Love, W. S. (1926). *Heart*, 13, 27.  
Stricker, T., and Buck, F. (1940). *Mém. Acad. Chir.*, 66, 235.  
Ungley, C. C., and Blackwood, W. (1942). *Lancet*, 2, 447.

## RESULTS OF EXTERNAL PROPHYLACTIC VERSION

BY

M. V. TRUBKOWITCH, M.D.

Second Obstetric-Gynaecological Clinic of the Second Moscow Medical Institute

AND

Prof. B. A. ARCHANGELSKY, M.D.

Director of the Clinic

This is a preliminary communication with the object of setting out results of prophylactic cephalic version conducted under the direction of Prof. Archangelsky in cases of breech and transverse presentations. It relates to the period 1931-41, with the majority of cases dealt with in the years 1940-1.

External version was carried out in 324 cases of breech, transverse, and oblique presentations. Of these 324 cases version was successfully performed in 293 (90.5%) and unsuccessfully in 31 (9.5%). Of the 293 successful cases 251 had been breech and 42 transverse and oblique. In somewhat under 10% of the cases either version could not be performed or, when performed, the position of the foetus relapsed into the original state. As a rule the operation was conducted in the 35th to 36th week of pregnancy, and only in 4 instances was an anaesthetic employed. In the majority of cases of successful version the desired result was obtained at the first attempt. Repeated attempts had to be made in a few isolated cases—multiparae with a small foetus and lax pendulous abdomen.

To what extent is foetal mortality reduced by the timely performance of version? Of 247 births that took place after version 3 were stillbirths (1.2%). On the other hand, among 19 cases in which version was not successful there were 2 stillbirths (10.5%). Of 228 cases in which the performance of version procured a vertex presentation there was only one stillbirth (0.44%).

Table to Illustrate the Foregoing

	No. of Births	Live Births	Stillborn
Version performed ..	247	244 (98.8%)	3 (1.2%)
" successful ..	228	227 (99.6%)	1 (0.44%)
" unsuccessful ..	19	17 (89.5%)	2 (10.5%)

### What is the Significance of External Prophylactic Version in Obstetrics?

To answer this we must examine the incidence of the various abnormal positions of the foetus. Of 107,966 births in the city of Moscow 99,552 took place at term. Of these 99,552 full-term births 96,048 (96.2%) were vertex presentations, 3,148 were breech (3.2%), and 356 cases were transverse and oblique (0.4%). Thus all non-vertex presentations provided 3.6%. Of the 96,048 head-presentation births 905 (0.94%), of the 3,148 breech presentations 318 (10.1%), and of the 356 transverse presentations 104 (29.2%) were stillborn.

	Births	Stillborn
Total number of births ..	107,966	2,048 (1.88%)
Full-term births ..	99,552	1,327 (1.32%)
Head presentation ..	96,048	905 (0.94%)
Breech ..	3,148	318 (10.1%)
Transverse and oblique ..	356	104 (29.2%)
After version ..	247	3 (1.2%)
After successful version ..	228	1 (0.44%)

It will thus be seen that successful version reduces the mortality to the level obtained in ordinary head presentation and so reduces the foetal mortality in breech presentation 10 times and in transverse or oblique presentations 25 times.

### Complications Attendant on Version

1. *Premature Labour.*—Out of 103,735 births in Moscow 7,657 (7.4%) were premature. Out of 228 cases in which version procured a head presentation at birth 2 were premature, or below 1%. This low rate is explained partly by the fact that version was done in the 36th week, a time close to full term already, and partly by the fact that version was not

performed when there were any contraindications. Obviously premature labour, where it took place, occurred before the date at which version would normally have been undertaken. All the same, the fact that only 1% of premature labour took place after version in 228 cases permits of the conclusion that version *per se* does not lead to premature labour.

2. *Haemorrhage.*—Out of 324 cases in which version was carried out only 1 case had slight haemorrhage—about 3 weeks before the onset of labour—and this had no effect on the subsequent period of pregnancy or labour.

3. *Premature Separation of the Placenta; Adherent Placenta Requiring Manual Separation.*—These conditions did not occur in any of our cases. This leads to the conclusion that external version, when all contraindications are carefully observed, does not lead to risks of haemorrhage.

4. *Premature Loss of Liquor Amnii.*—Out of all our cases this took place in about 5%. In the cases in which version was carried out premature rupture of the membranes occurred in 2%. This leads to the conclusion that the treatment exerted no influence in this direction.

5. *Prolapse of the Cord.*—Among all our clinical material this was observed in 0.4% of cases of head presentation and 2.1% of cases of breech presentation. After version which secured a head presentation this took place in 0.44%. The conclusion is reached that prolapse of the cord is not accelerated by version. On the other hand, in those cases in which a breech presentation could not be successfully turned into a head presentation prolapse of the cord took place in 11.5%.

6. *Does Version produce a More Frequent Occurrence of a Twisted Cord?*—Among all our clinical cases this was observed in 16.8%. Out of 228 cases in which version procured a head presentation at birth this was noted in 12 cases, or 5.2%.

We see, therefore, that external cephalic version does not contain any dangers provided it is carried out with due regard to indications, contraindications, and proper technique.

## Medical Memoranda

### Histiocytic Medullary Reticulosis with Transient Skin Lesions

In 1939 Bodley Scott and Robb-Smith separated from the group of diseases commonly known as "atypical Hodgkin's disease" a number of cases with such a uniform clinical and pathological picture as to suggest that they represented a distinct disease process. Histologically they showed a cellular proliferation, involving chiefly the histiocytes and their precursors, which affected the whole lympho-reticular tissue, the medullary portions of the organs being principally affected; and for these reasons "histiocytic medullary reticulosis" was suggested as a pathologically descriptive name for the disease. They reported four new cases and gave records of six others which had previously been published. The clinical picture was that of a rapidly fatal disease characterized by fever, wasting, generalized enlargement of the lymph nodes, enlargement of the liver and spleen, progressive anaemia, leucopenia, and, in some cases, purpura and jaundice. The following case, which histologically proved to be typical of this disease, showed many of these clinical features but differed in presenting a leucocytosis, which has not been previously recorded, and skin infiltrations, which had disappeared by the time the patient died.

#### CASE RECORD

A married woman aged 52 was seen in consultation with Dr. H. S. K. Lowry on Nov. 3, 1942, complaining of weakness. She had enjoyed good health apart from a rash two years previously which was thought to be pemphigus. For three and a half weeks she had been easily tired. Two weeks later she had diarrhoea and a temperature of 101°. Four days after this she developed a cough with rusty sputum. On sulphapyridine the temperature fell to normal and then gradually rose again. Two days before the consultation a tender purplish lump had appeared on the face, and this was followed by similar lesions on the trunk and limbs.

On examination her temperature was 98.6° and pulse 102. She looked ill. Her face had a yellow tinge, but there was no jaundice. The mucous membranes were pale. The skin lesions were situated on the forehead, cheeks, neck, upper chest, back, and proximal halves of arms and legs. They were raised purplish-red plaques



varying in diameter from 1/4 to 1 in., firm in consistency, and tender. The colour faded on pressure but did not completely disappear. There were enlarged soft lymph nodes in the left posterior triangle and right axilla. There was an area of impaired resonance with diminished air entry and rales in the left axilla. The liver was enlarged to 1/2 in. below the costal margin, and the tip of the spleen was just palpable. A blood count gave: erythrocytes, 3,910,000; haemoglobin, 62%; colour index, 0.8%; leucocytes, 13,400 (polymorphonuclears 10,251, lymphocytes 2,680, eosinophils nil, basophils 11, large mononuclears 469). The Paul-Bunnell test was negative, as was blood culture. The urine was normal.

The patient ran an irregular pyrexia up to 103°. Fresh skin lesions appeared during the next two days and then gradually faded and disappeared. None were visible at the time of her death. Enlarged nodes were palpable in both posterior triangles, axillae, and groins. The spleen became more easily palpable. The leucocyte count rose to 17,800 and then fell to 7,600 shortly before death. In spite of blood transfusion haemoglobin fell to 43%; she developed scurvy and oedema, and died on Nov. 30, 7½ weeks after the onset of symptoms. At no time during the illness were there petechiae or haemorrhages from mucous membranes.

**Post-mortem Examination** (Dr T. B. H. Haslett).—There was generalized enlargement of lymph nodes, more particularly those of the aortic, coeliac, and mesenteric groups. They were white and fleshy, with considerable haemorrhage into the mesenteric nodes. The spleen was enlarged, soft, and red, the increase appearing to be chiefly in the pulp, although there were a few discrete white nodules on the cut surface. The liver was fatty but otherwise normal. The lungs showed passive congestion and terminal bronchitis. The other organs were normal.

**Histological Report** (Dr A. H. T. Robb-Smith).—Section of a lymph node showed a marked proliferation in the sinus and medulla of the histiocytic elements and of atypical cells—pro-histiocytes; i.e., large cells which are polygonal in outline with nuclei rich in chromatin and prominent nucleoli. There were also zones of fibrinoid necrosis, but no obvious increase of fibrous tissue and no free iron could be observed, nor was there any proliferation of the histiocytic elements in the peri-adenoid tissue. The spleen showed a comparable picture, although the degree of necrosis was even more marked, and it had only an occasional follicle which could be made out. There was no free iron in the spleen. Both in the lymph node and in the spleen there had been phagocytosis of the red cells by the histiocytes. The liver was the least involved. There were a few perportal collections of pro-histiocytes, but the Kupfer cells, although hypertrophied, were essentially normal. The appearances throughout all the organs were typical of histiocytic medullary reticulosis.

R. G. ANDERSON, M.D., M.R.C.P.,  
Hon. Physician, Cheltenham General Hospital.

#### REFERENCE

Scott, R. Bodley, and Robb-Smith, A. H. T. (1939) *Lancet*, 2, 194.

### Pyloric Stenosis in Identical Twins

It may be generally stated that identical abnormalities in dizygotic twins are no more frequent than in brothers and sisters born singly, whereas in monozygotic twins it is the rule that abnormalities are shared. Assuming that pyloric stenosis is a congenital abnormality, the above statement should be borne out by examination of recorded cases. This appears to be so (see Table).

#### Summary of Cases of Pyloric Stenosis in Twins (O'Donnell and Klein, 1941)

	Both Affected	One Affected
Dizygotic twins (binovular) ..	2	21
Monozygotic twins (uniovular) ..	10	1 ± 1*

\* The two cases of monozygotic twins in which only one member was affected were reported by Lasch (1925) and Sheldon (1938). In both of these the type of twinning was substantiated by a description of the placenta, only one chorion being present in each case. In the former the diagnosis seems to have been somewhat in doubt, but in the latter a pyloric tumour was found at operation on the affected member. Observation of one feed only in the other twin revealed no evidence of pyloric stenosis.

#### CASE REPORT

Male twins A. C. and B. C. were born on Feb. 24, 1943. They have a normal brother aged 3. The delivery was normal, and the placenta was described as a single body with only one chorion. Both were entirely breast-fed. At four weeks A. C. started vomiting after nearly every feed, and the vomits were often projectile in character. The stools were green. He was admitted to the Hospital for Sick Children, Great Ormond Street, one week later weighing 6 lb., or 1 lb. 4 oz. below the estimated weight for age. (His brother at this time weighed 6 lb. 8 oz.) Test feeds showed that he was taking 2½ to 3 oz. per feed, given three-hourly—six in the day. On examination the ears, throat, and urine were normal. Dehydration was not evident. Observation of the abdomen during a feed showed typical "golf-ball" peristalsis, and a pyloric tumour was palpable in the right upper quadrant. Rammstedt's operation was performed by Mr. Humby under local anaesthesia and a definite tumour was found. Convalescence was uneventful, and the baby

was discharged home, gaining weight, on the fourth day after operation, returning on the eighth day for removal of stitches.

B. C. has a right inguinal hernia. He is described by his mother as "never having vomited since birth." Feeds have been watched on three occasions; visible peristalsis has been seen and a pyloric tumour felt. A barium meal was given at three months, and "a definite delay at the pylorus" was reported.

#### COMMENT

This report presents two interesting features: (1) monozygotic twins with the same congenital abnormality; (2) pyloric stenosis present in a baby without producing any symptoms.

I should like to express my indebtedness to Dr. Donald Paterson for permission to publish this memorandum.

F. L. KING LEWIS,

House-physician, Hospital for Sick Children, Great Ormond Street.

#### REFERENCES

Lasch, W. (1925) *Allg. med. Wochr.*, 72, 1155.  
O'Donnell, F. T., and Klein, J. (1941). *Amer. J. Dis. Child.*, 62, 1025.  
Sheldon, W. (1938) *Lancet*, 1, 1048.

### Induction of Labour in Contracted Pelvis by Digital Separation of the Membranes

Although most obstetricians in this country are now agreed that the method of treatment of choice for cases of minor and medium degrees of contraction of the pelvic inlet in primigravidae is by "trial labour" and not by surgical induction before term, all must have been disappointed at the necessity for Caesarean section in those cases in which the "trial" failed because of the "more than average" size of the baby. Caesarean section, especially in the young primigravida, is a procedure which, if delivery per vaginam is impossible, is better avoided, as it limits the number of pregnancies to three, and, in fact, the patient often expresses a desire to be sterilized at the second operation.

The problem in these cases is to get the patient to go into labour while the baby is still small enough to pass through the pelvic brim. Simple medical induction by castor oil, quinine, and pituitary extract is only rarely successful before term, whereas surgical induction by rupturing the forewaters or even the hindwaters contraindicates Caesarean section, should the latter become necessary later on for such indications as uterine inertia or foetal distress, by reason of the risk of sepsis.

The purpose of this communication is to recommend digital separation of the membranes from the lower uterine segment, and this is performed immediately before simple medical induction is begun. Separation of the membranes has been advocated by various authorities, but, so far as I know, is not generally practised. It is carried out, I believe, in the Simpson Memorial Hospital, in Edinburgh.

In cases of pelvic contraction in which bimanual examination is being carried out at weekly intervals after the thirty-sixth week, and when it is decided that the head will just mould through the brim, digital separation of the membranes by using the index finger of the right hand is performed with the usual antiseptic precautions. The membranes are cleared for as great an area as the finger can reach when introduced through the os. Medical induction is started the same day.

During the past 18 months this method has been used in this department in suitable cases of contraction of the pelvic brim, mainly where the true conjugate diameter was between 3.25 and 3.75 in. In a series of 32 such cases in which separation of the membranes, followed by medical induction, was carried out labour failed to come on within a period of 10 days in only three. The mean weight of the babies in the cases which responded was 6 lb., labour was not long, and use of outlet forceps was necessary in only two. It may be said, therefore, that labour was induced too soon, but the striking fact is that labour can be brought on by this method in the great majority of cases after the thirty-sixth week. There was one neonatal death, occurring in the first fourteen days.

The advantages of this method are: (1) Caesarean section can be safely undertaken later in labour if necessary (it was necessary in the three cases which did not respond); (2) the membranes, being intact, serve to protect the soft head as it moulds through the brim; (3) such complications as prolapse of the cord are obviated; (4) if medical induction is begun on the same day, and is repeated every third day, labour comes on within a day or two in the great majority of cases.

I have pleasure in expressing my indebtedness to Dr. W. J. Clancy for his advice and assistance, and to Dr. Rennie, medical officer of health, and Dr. James Clark, medical superintendent, for permission to publish this communication.

D. CHALMERS WISEMAN, M.B., B.Sc.,  
F.R.C.S.D., M.R.C.O.G.,

Assistant Obstetric Surgeon, City General Hospital, Sheffield.

## Reviews

### BODY POISE

*Body Poise.* By Walter Tinslow, M.D., F.A.C.S. (Pp. 312; illustrated. 4.50 or 25s.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1943.

This is an interesting monograph of particular value both to orthopaedic surgeons and to medical gymnasts. The main theme is the emphasis on the importance of scientific training in posture—i.e., a return to the principles of the older Swedish physical culture, which in recent years has been to a large extent supplanted by games, dancing, and rhythmic exercises—in remedial work.

The book contains three sections. In the first there is an account in simple language of the normal anatomy of the skeleton, joints, and muscles, described not in terms of regions but built up from the "sole of the foot to the crown of the head." This forms a good introduction to the anatomical problems of poise. The second part deals with those physical breakdowns which are characterized by muscular insufficiency, and a detailed scheme of exercises is presented for each type of disability—e.g., weak foot, flat-foot, postural defects of the spine, and so on. In the last section there is an interesting and valuable account of body poise in its special relation to games, sports, and athletics in general.

Throughout the work a full description is given of exercise schemes which have been used by the author in his practice as an orthopaedic surgeon for many years. There is also a useful account of his methods of recording deviations from normal posture. For the most part the exercise schemes, whether designed for muscle building, posture training, or correction of deformity, are of the type used by modern remedial gymnasts. Some of the exercises are admittedly difficult, and require special instruction and supervision. In postural training, for example, too little use is made of the recumbent position, which most authorities regard as an essential introduction to the final scheme in the standing position. But these are minor criticisms. The book as a whole is stimulating and authoritative, and it is a valuable addition to the departmental libraries of orthopaedic clinics and remedial exercise units.

### PSYCHOLOGICAL MEDICINE

*Manual of Psychological Medicine for Practitioners and Students.* By A. F. Tredgold, M.D., F.R.C.P., F.R.S.Ed. (Pp. 298, 18s.) London: Baillière, Tindall and Cox. 1943.

This war, like the last, has brought psychological medicine into great prominence. Men and women recruited into any of the Forces are more or less physically fit; they are on the "whole allotted to jobs within their physical capacity. Medical examination for physical fitness is more thorough than for mental stability, so that psychological breakdown for that reason alone is likely to be relatively more frequent than physical breakdown among the armed Forces in comparison with the civil population. Finally, war engenders emotion, especially the emotion of fear, to a degree unknown in peacetime, so that so-called psychosomatic disorders become common, as well as disturbances that remain essentially in the mental field.

It is no doubt under the stimulus of this situation that Dr. Tredgold, whose textbook on *Mental Deficiency* has long been a standard work of reference, has produced a convenient *Manual of Psychological Medicine*. It is, as would be expected from such a source, written clearly and readably. Its sources are eclectic and sometimes unconscious. It has some Kraepelinian imprints and others of a later date, and, as is the way with imprints, they are sometimes indistinct. The allusions to Freudian doctrine, for example, do not seem to refer on the whole to its more recent developments. The discussion of the more definitely psychogenic types of illness is superficial, especially in regard to children; but the book is intended as a general handbook and not as a work for specialists.

There are some suggestions which are perhaps in these days a little unorthodox. For example, Dr. Tredgold recommends that people with anxiety states should be put to bed as a

routine. There are some novel observations, such as that administration of strychnine, which is certainly not customary in these conditions, may drive the patient to suicide. It would be interesting to have this observation documented. Spasmodic torticollis is classed as hysterical, without further comment, the very interesting condition of anorexia nervosa is barely referred to. Confidence is expressed in the cure of traumatic neurosis by the award of a lump sum. Suicide is spoken of as a frequent outcome of obsessional neurosis, which is not a conventional opinion. A good case is made for the rehabilitation of chronic neurasthenia as a clinical concept, on constitutional basis.

The chapter on mental defect is the masterly summary that one might expect from an author whose experience is pre-eminent in this field. He gives a healthy warning, much needed in these days of the widespread use of intelligence tests, that in themselves they are quite inadequate as a gauge of social incapacity.

### RUDIMENTS OF ALLERGY

*Primer of Allergy.* By Warren T. Vaughan, M.S., M.D. Second edition (Pp. 176; illustrated. 10s.) London: Henry Kimpton. 1943.

"Tradition has it that in former times when two or three ladies were gathered together they adored talking about their operations. To-day they adore talking about their allergies. To enlighten them in such discussions on this 'strange and tantalizing state,' and to help others to understand everyday topical remarks on stage and screen, Dr. Warren Vaughan has published a *Primer of Allergy*. The doctor or consultant is regarded as the expert in strategy; it is the sufferer alone who must conduct the campaign. The primer is designed to help such sufferer to adjust himself with the utmost success to those environmental factors which contribute to his discomfort. The subject-matter is portrayed in very modernistic military mood, with a description of the enemy (allergens), the defence of the realm (methods of combating sensitization), liaison and reconnaissance (taking inventory), plan of attack (therapeutic programme), and, finally, 'victory or defeat.' Precise directions for patients suffering from each of the common allergies are set out at great length, with methods for avoiding or removing the common inhalant and food allergens, and the keeping of inhalant and food diaries—in fact everything of interest to the punctilious or scientific patient. The numerous illustrations are in cartoon fashion with a final Tom Mix-ish 'farewell to allergy.' The book will teach and help the sufferer to 'live with his allergy.'

### Notes on Books

A manual entitled *Diseases of the Ear, Nose and Throat* by Dr. DOUGLAS CARRUTHERS of Sydney will prove useful as an introduction for students to clinical work in a special department. There is no attempt to treat any part of the subject in detail, but the author is doubtless aware of the kind of information his students demand. There are, however, numerous books of similar scope with which this one enters into competition, and the senior student will in due course indicate whether or not it receives his approval and meets his requirements. A sound innovation is the inclusion of a chapter on diseases of the mouth, but it is too short, consisting of less than three pages, and the author has in the same way touched very lightly on other important subjects, especially diseases of the larynx. The feature on which he lays special emphasis is methods of examination, and in this he shows his appreciation of the chief clinical need of the student and his experience as a teacher. The book is published at 25s. by Angus and Robertson of Sydney and London.

That a textbook should require six editions in less than twelve years gives ample proof of its excellence and suitability for the purpose in view. This is what has happened to *Massage and Remedial Exercises in Medical and Surgical Conditions*, by NORTON M. TOWN (Bristol: John Wright and Sons; 25s.). The general scheme of the book is a systematic presentation of diseases arranged in accordance with the various systems of the body. A brief outline of the aetiology, symptomatology, and pathology of each disease is followed by a section on treatment, in which the physical treatment is dealt with in detail, illustrated where possible by photographs or diagrams. In the present edition the chapters on fractures have largely been rewritten to bring them up to date, otherwise no particular changes have been made. At a time when rehabilitation is in everybody's mind a book such as this must be of the utmost value, and the appearance of a new edition is very timely.

## BRITISH MEDICAL JOURNAL

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## REGULATION 33B IN PRACTICE

Much is being said and written about Defence Regulation 33B which hinders a real understanding of its purpose. This regulation, which came into force just a year ago, is in itself rather misleading. It is headed "Compulsory Treatment of Venereal Disease," and, together with the rules and directions issued under it, gives detailed instructions to special practitioners and to medical officers of health on the action they are to take if a patient names or otherwise indicates the "contact"—the person whom he (or she) suspects to be the source of the infection. This information must be kept secret, and is covered by qualified privilege in case of proceedings for defamation. The special practitioner must send particulars of the patient and the contact to the medical officer of health. If one person is named as a contact by two or more patients the M.O.H. must (if the information seems reasonably probable) serve a notice on the contact to attend for examination by a special practitioner of her (or his) choosing. Failure to obey is punishable by fine, prison, or both. If the contact is found to have communicable disease the practitioner serves her with compulsory notice to be treated; and here again she may choose her own special practitioner.

The regulation has been bombarded with all kinds of adverse criticism, particularly by certain keen voluntary workers. They say it creates a class of informers; the contact is at the mercy of an unknown accuser; she may be forcibly examined on the word of two persons who may conspire to defame her with impunity; it introduces notification of venereal disease by a side wind. More reasonable is the complaint that the regulation covers such a minute class that it is practically ineffective. Its text has been analysed by lawyers, notably by Mr. N. P. Shannon,<sup>1</sup> in great detail, and this scrupulous examination has produced more criticism of a different kind. Mr. Shannon, for instance, suggests that the rules do not provide with enough certainty that the patient should be warned that his name and address will go to the medical officer of health's office if he gives information. A special practitioner, moreover, may remain responsible for the treatment of a contact by a colleague, but has no right even to be informed whether the contact is duly attending for treatment. In at least some circumstances a special practitioner may be obliged to disclose confidential information in court. Mr. D. H. Kitchin points out<sup>2</sup> that on a strict reading of the text an M.O.H. may not disclose information concerning a contact even to a member of his staff unless for the enforcement of the regulation.

All these critics have tended to lose sight of the real meaning of Regulation 33B. The elaborate and rather

repulsive procedure for compulsory examination and treatment is in fact hardly ever used. What 33B does, and is meant to do, is to help the medical officer of health to trace contacts. It ensures that he shall receive at any rate some of the information he would have if venereal disease were notifiable. He is not legally obliged to move until he has two notices affecting the same contact; but actually, in a growing number of areas, he moves on the first notice, sending a social worker to visit the contact and induce her to come and be examined. This method of informal, assiduous persuasion will do more to combat venereal disease than any other single measure. Speakers at a discussion held by the Medico-Legal Society on Oct. 28 testified that by far the most usual attitude in a suspect visited by a social worker is horror at a grim possibility which had never occurred to her, and eagerness to be cleared or cured as soon as possible. Anger, recrimination at the informer, and threats of a slander action are extremely rare. The objections to the regulation come mainly, in fact, not from the contacts but from well-meaning members of voluntary societies. The informal approach clearly does no injustice whatever to the contact, even if she has been wrongly indicated. That to facilitate it is the true object of the regulation appears from a circular recently sent out by the Ministry of Health to councils of counties and county boroughs.<sup>3</sup> The Minister, it says, takes the view that a local authority for venereal disease should, as a recognized and regular part of its work, do what is possible to trace contacts and persuade them to attend for treatment. To remove the legal barrier imposed by Defence Regulation 84, which enjoins strict secrecy until the information is used for the purposes of the regulations, the Minister is using the power Regulation 84 gives him to permit disclosure: he accordingly declares that information obtained through the operation of Regulation 33B may be disclosed so far as is necessary to enable action to be taken, in discharge of the functions of the council as a venereal disease authority, to trace contacts of persons suffering from venereal disease and to persuade them to undertake treatment. Approved additional expenditure on this work will rank for grant. The circular also observes that persons doing the work enjoy the same protection against actions for defamation as do persons acting under Regulation 33B—viz., in the absence of malice or indirect motives they are not open to such actions for anything done as part of their duty. With respect, this reassurance is not quite accurate. Qualified privilege does not prevent an aggrieved person from bringing an action; the M.O.H. or officer acting under him is still "open to" action, but of course the likelihood of one being brought is much less when the defence of qualified privilege is known to exist.

Another legal aspect of venereal disease practice ought to be considered. In at least one area the contacts are sought out from the clinic and not from the health office. The exponents of this plan aim to dispense with the 33B procedure, which they dislike, and especially with the notification to the M.O.H. of the patient's—the "informer's"—name. But the first words of the regulation lay down clearly that any special practitioner who receives from a patient information about the source of the disease must

<sup>1</sup> *Brit. J. vener. Dis.*, 1943, 19, 22, 67.<sup>2</sup> *Med. Pr.*, 1943, 705, 264.<sup>3</sup> Circular 2596, Dec. 25, 1943

unless he thinks the information has no substance) send he prescribed notice to the M.O.H. If the practitioner gets such information he is bound by law to pass it on. If the proper notice is duly sent to the M.O.H. an unofficial approach by the clinic staff is now lawful, but the terms of the regulation do not allow it to be side-tracked in any method of tracing contacts.

The numbers of patients and contacts affected by Regulation 33B are still lamentably small. Up to June 30, 1943—the latest date for which figures are available—110 contacts had been indicated by two patients each and so brought under the regulation; 71 of these were treated and 3 prosecuted for breach of notice to be examined or treated. About 1,780 other persons were indicated by one patient each, but only 220 of these were informally induced to undertake treatment. It is to be hoped that the Minister's information is incomplete, and that the numbers have risen during the considerable interval that has elapsed since these figures were compiled; but the reply given on Jan. 20 and reported in last week's Parliamentary Notes at page 203 adds little to our knowledge.

Perhaps as workers against venereal disease realize that 33B is meant to help them, and that its "manifest content" really matters very little, they will cease to be afraid of the bogeys that their imaginations, with assistance from legal commentators, have conjured up, and will make more use of it. The truth is that 33B belongs to a class of law that was once unknown in this country but has now come, without attracting much attention, to occupy a definite place in our legal system, and a place which will certainly become more and more important. This is administrative law: it expresses a theoretical or contingent purpose while designed to fulfil an ulterior practical one. The growing complications of life brought it forth, and the country's danger has immensely quickened its growth. No robust Earl of Halsbury now sits to challenge the rising tide; the courts' concern is to give the Executive every support and encouragement. Safeguard against abuse of power is now rather to be found in an informed and vigilant public opinion, to which Ministers are fortunately very sensitive. Venereal disease workers and others would do better to realize that administrative law has come to stay, study its uses, and work with it as loyally as possible.

## CARBON TETRACHLORIDE AND THE LIVER

The lethal effects of carbon tetrachloride, in both men and animals, have long been known to be associated with cellular damage of the liver and kidneys, but a feature which surprised the earlier investigators was the rapidity with which regeneration took place in non-lethal cases. Carbon tetrachloride in repeated sublethal doses was, comparatively speaking, also found to have remarkably low toxicity for a substance at one time regarded as the most dangerous of modern industrial solvents. More recent investigations have helped to clear up the mystery and to confirm the view that, although carbon tetrachloride is an industrial hazard liable to cause temporary disablement and severe discomfort, the rapid and disagreeable effects to which it gives rise provide some safe-

guard against permanent damage from repeated sublethal dosage. Even in cases of acute poisoning by ingestion the actual damage is apparently more a disturbance of metabolism than destruction of tissue, and can be prevented from becoming fatal if suitable measures are taken in time. Repeated non-lethal exposures, sufficient to cause more or less severe disturbances of health at the time, leave no permanent ill effect if the interval between them is long enough to allow regeneration. This view is supported by the results of two separate investigations—of one case of acute poisoning, and of a series of cases of chronic poisoning with gastro-intestinal and mental symptoms after repeated inhalations of high concentrations.

Since animal experiments have shown that the essential tissue damage in severe carbon tetrachloride poisoning is acute hepatic necrosis and acute nephritis, it might be expected that symptoms of poisoning in human beings would be associated with evidence of such damage, as revealed by liver-function tests and urinary analysis. The outstanding feature of subacute and chronic hepatitis is shown by Higgins and his co-workers in a paper appearing elsewhere in this issue to be a disturbance of the plasma proteins. A fall of serum albumin below 2 g. per 100 c.cm. is of grave significance, while a rise in globulin is common in all varieties of hepatitis and a persistent alteration of the albumin/globulin ratio indicates irreparable damage. In subacute hepatitis a moderate rise in serum bilirubin and phosphatase is accompanied by striking changes in the plasma proteins and a gross reduction in the laevulose tolerance. Yet in a case described by Beattie and his co-workers in our opening pages, in which acute carbon tetrachloride poisoning followed accidental ingestion of 30 to 40 ml., the only significant abnormality as shown by liver-function tests was a rise in serum bilirubin during the acute phase, although the liver enlarged rapidly. Urinary tests for albumin, sugar, bile, and urobilinogen were also negative, except for a transient appearance of urobilinogen during a relapse. The successful treatment of this case by methionine, as an intravenous infusion with a papain-trypsin digest of casein, gave further opportunity to investigate the nature of the liver damage. An attempt was made to follow the mode of action of methionine by estimating the nitrogen and sulphur balances of the patient and by determining the partition of the urinary sulphur between the oxidized (total sulphate) and unoxidized (neutral) fractions. The nitrogen balance was negative during the first two days and positive during the next two. The patient also excreted an excessive amount of unoxidized sulphur during the first two days. The suggestion is made, therefore, that during the acute phase protein synthesis in the liver was disturbed, but that this disturbance was in the nature of a metabolic derangement rather than due to an actual destruction of liver substance.

Absence of actual hepatic injury from repeated though less severe exposure has also been demonstrated in an investigation by Stewart and Witts<sup>1</sup> of a series of cases of "chronic" carbon tetrachloride intoxication in a factory where high concentrations of carbon tetrachloride in the atmosphere were apt to occur from spillage and leak-

<sup>1</sup> Brit. J. Indust. Med., 1944, 1, 11.

age. A large number of workers had complained of symptoms which could be sharply divided into two groups: gastro-intestinal and cerebral. Nausea, vomiting, colic, and diarrhoea were the prominent features of the gastro-intestinal disturbance, but were quickly relieved by a brief period of absence from work; and in spite of recurrent episodes there was no continuous deterioration in health. Giddiness, vertigo, acute and chronic headaches, drowsiness, alteration of the sleep rhythm, and mental hebetude characterized the cerebral effects, but these also disappeared with surprising rapidity on removal from exposure. Even in the cases with most severe gastro-intestinal disturbance—which earlier writers considered to reflect an early stage of liver damage—the blood urea, serum bilirubin and phosphatase, and the plasma proteins were all within normal limits; and the Takata-Ara reaction was negative throughout. Five cases of albuminuria had occurred among the exposed workers, but in the three eventually traced and re-examined this was not accompanied by other evidence of progressive renal disease. Radiographic and gastroscopic examination revealed hypertonicity, irregular peristalsis, and spasmodic contraction of the stomach and intestines, and hyperchlorhydria was found in more than 50% of the cases examined. It is suggested, therefore, that both the cerebral symptoms and the gastro-intestinal disturbance, bearing a strong resemblance to post-anaesthetic sickness, are the result not of liver damage but of the narcotic action of carbon tetrachloride on the cerebral cortex, as shown by mental hebetude, and of a stimulant action on the parasympathetic, or inhibition of the sympathetic, centres in the hypothalamus, as shown by the gastro-intestinal symptoms. This view of the mechanism of action of  $\text{CCl}_4$  is not identical with the methionine hypothesis put forward by Beattie, but both investigations bring out very clearly the fact that to cause permanent liver damage the immediate toxic action of exposure to carbon tetrachloride must be repeated at short intervals. If death can be prevented by suitable treatment, as in Beattie's case, or if the dose is too small to produce definite changes in the liver, repeated exposure at long enough intervals will not cause hepatic injury. But in animals, at least, central necrosis of the liver, reversible for a time, may be followed by irreversible cirrhosis if the dosage is repeated often enough. It would therefore seem wise to ensure that, in factories where exposure for any reason cannot be prevented, the "sufficiently long interval" between exposures of workers should be achieved by alternation of work whenever symptoms appear.

### STATISTICS OF INCAPACITATING ILLNESS IN CANADA

The reports on incapacitating sickness among the insured population, issued by the Health Department of Scotland for the seven years from mid-1930 to mid-1937, are well known; but, owing to the publications being less accessible, few people in this country can yet have seen the Statistical Studies of Illness in the Civil Service of Canada for the fiscal years 1936-7, 1937-8, and 1938-9, which were published in 1939 and 1940. These studies of morbidity began in 1934, and embraced the numbers of working days lost owing to illness and accidents in a population of some 35,000 civil servants, including outdoor workers connected with mining, agriculture, fisheries, and postal ser-

vices. At the beginning of this work no standard code of diseases for morbidity, as distinct from mortality, was available, but the preparation of a code which could readily be correlated with the International List of Causes of Death was stimulated by studies in progress at that time of the records of pensioners from the war of 1914-18 (eventually published in 1939). The outcome was the completion of a Standard Morbidity Code for Canada, based upon the 4th revision of the International List (1929) and issued by the Ministry of Pensions and National Health in 1940. This code had been accepted as standard in Canada as early as 1936, and an index to it was prepared under the direction of Mr. J. T. Marshall, at that time in charge of the vital statistics of British Columbia and now Chief of Vital Statistics for Canada. It was employed for the Civil Service studies referred to above and is also being used in the classification of Army and pensions records in the present war. The U.S. Public Health Code, and the Medical Research Council's code in this country, are based upon the latest revision of the International List (1938), but most of the disease sections can be correlated with the Canadian code without difficulty, though the classifications of injuries will not be so easy to relate.

The Civil Service tabulations provide records over three consecutive years of the numbers of persons ill, numbers of illnesses, total days lost, and average days lost per illness from each important disease group in a population which varied little from 35,000 and included some 5,700 women. The time lost by certified illness of all kinds averaged 5.9, 5.7, and 5.9 days per person in the years 1936-7, 1937-8, 1938-9 respectively. Sick leave without certificate is allowed for three days or less at a time, up to an annual total of eight days, and such absence can be included only in the all-causes totals; in the three years it averaged 1.6, 1.4, and 1.7 days per person. Among the many diseases distinguished, "influenza" was the largest single cause of certified illness, being responsible for 33, 18, and 29% of illnesses in the three years, and for 18, 9, and 16% of the total days lost. For the respiratory type the average durations of sick leave were 11, 8, and 10 days, and for other types 8, 8, and 11 days. Approximately 2 per 1,000 of the population were absent during each year as a result of tuberculosis. "Rheumatism" showed a steady rise with increasing age as regards both incidence and time lost; for males in 1936-7 the incidence rate was 32 per 1,000 at ages 60-64, compared with 7 at 25-29.

It is impossible in a short note to do more than refer to a few of the points of interest revealed by these careful tabulations, which will provide research workers in this field with a compendium of information for many years to come. Perhaps we may hope for similar analyses of sickness records in some large industrial groups in this country after the war, if not indeed from our own Civil Service. The importance of employing the M.R.C. code as basis for all such studies to be undertaken here, so that they may be comparable as regards nomenclature at least, hardly needs emphasis.

### BREAST-FEEDING

In 1942 the Minister of Health appointed an Advisory Committee on Mothers and Young Children, and at an early meeting a Health Campaigns Subcommittee was asked to consider what could be done to intensify the effort to secure more breast-feeding of infants. A report of this committee has now been published.<sup>1</sup> The subject-matter deals with the incidence of breast-feeding and its failure, with the arguments in favour of breast-feeding.

<sup>1</sup> Ministry of Health: Reports on Public Health and Medical Subjects. No. 91, *The Breast-feeding of Infants*, H.M. Stationery Office. (4s.)



and with recommendations. That there is need for more research into the physiological problems of lactation and that there should be better instruction of medical students, nurses, and midwives will be generally agreed. Improved statistical returns and propaganda through the B.B.C., women's journals, and educational films are also recommendations which can be readily accepted. It is also urged that paediatricians "or other medical officers specially interested in babies"—a phrase which might have been worded better to indicate the need for special experience—should be appointed to maternity wards or hospitals. The management of babies in such units is also considered, and alongside a plea for restricting the use of bottle-feeding was a recommendation for more elasticity in the whole routine of infant management. It is here perhaps that some doubts will arise. In a section on the paucity of statistical material the report refuses to consider the results obtained in "foreign countries," but if this means that they failed to take a look at New Zealand it is unfortunate. Whatever criticisms may be offered of the "Truby King system," it is generally admitted that for breast-feeding it is supremely successful, and it is fair to summarize it by saying that it largely substitutes detailed routine for the type of irregularity and slipshod methods that are certainly elastic. The subcommittee has apparently obtained a lot of evidence, some of which is reproduced, but its composition (two doctors out of eight members) does not carry complete confidence that the evidence has been satisfactorily probed and sifted. For example, there is a brief section in the report dealing with lamb dysentery and its prevention by early breast-feeding after immunization of the ewe. But this fact is recorded without any reference to the difference in placental structure in the different animal species and the varying importance of trans-placental and transmammary transmission of immune bodies. In other words, while the recommendations are for the most part admirable, the body of the report contains material which is distinctly superficial and is, in fact, to some extent not suitable for consideration either by the subcommittee or by the main committee, which appears to contain nine medical practitioners out of a total of 30. For such a committee to state that medical students are "taught a number of shibboleths about breast-feeding" is surely going far beyond the terms of reference, and it is probably inaccurate to infer as a result of interviews with medical students "from some of the big teaching hospitals" that attendance at an infant welfare clinic is never compulsory. Methods to increase the breast-feeding of infants are undoubtedly necessary, and the report indicates clear ways in which such methods can be at once developed; but it also touches on technical matters which does not appear to be capable of dealing with.

#### THE MEDICAL TECHNICIAN

We have received from the Association of Scientific Workers a memorandum on "The Problems of the Technician in Medical Laboratories": the latter term includes "hospital laboratories, industrial laboratories producing medical products, university laboratories of anatomy, physiology, biochemistry, pathology, bacteriology, etc., and laboratories of medical research institutes." It is first pointed out that this type of worker is at a disadvantage from two points of view: he cannot obtain a university degree in his subject by spare-time work, as workers may in other kinds of scientific laboratory, and his experience may not fit him for service in other spheres. It is therefore all the more important that his status should be defined and assured, and that conditions in this calling should attract and retain the right type

of entrant. This memorandum makes general proposals to these ends, of which the more important are that there should be a regular system of training, a recognized qualification, and a recognized salary scale. With the first of these proposals there can be no disagreement: all junior technicians should be given the opportunity of training for higher posts, both by enabling them to attend courses of instruction in polytechnics or elsewhere and by systematic instruction from seniors in their own departments. A qualification presents greater difficulties: there are several such already, notably the diploma of the Institute of Medical Laboratory Technology, formerly known as the 'Pathological and Bacteriological Laboratory Assistants' Association. It is suggested here that this diploma might continue to be the recognized qualification for technicians in clinical laboratories, but that the ideal to aim at for medical technicians generally is a university diploma. This proposition and that of "encouraging part authorship of publications of scientific work in which the technician has made a constructive contribution apart from purely technical assistance" both appear to envisage a generally higher status than is now everywhere recognized. An adequate and more or less standard scale of remuneration is much to be desired: present rates vary widely, and it is no secret that valuable technicians often leave the laboratories which have trained them to enter a service where the rates of pay are much higher. We wish success to any effort aimed at bringing these things about, but more specific proposals will be necessary before anything can actually be done. It will also have to be decided first whether workers in laboratories of so many different kinds should be catered for in one scheme. There is little in common between work in an anatomy department, a clinical laboratory, a serum institute, and a factory turning out endocrine products, and no unified scheme of training and qualification can cover all the specialized types of laboratory work connected with medicine. There is something indeed to be said for having separate organizations caring for the interests of technicians in the academic, clinical, and commercial spheres.

#### A NEW SYNTHETIC OESTROGEN

A new series of synthetic oestrogens has been discovered in America by Blanchard, Stuart, and Tallmann.<sup>1</sup> The most active is 2:4-di-(*p*-hydroxyphenyl)-3-ethyl hexane, with a laboratory number of 118B, and now known as "octofollin." The authors rightly point out that this compound is not chemically related either to the natural oestrogens or to those of the stilboestrol series. Actually it is not very different from hexoestrol, the chief difference being that the two carbon atoms to which the phenyl groups are attached are not adjacent as in hexoestrol but are separated by a carbon atom to which an ethyl group is attached. It is interesting that the formula of octofollin cannot be arranged on paper to look like that of the natural oestrogens. Some of the new series can, but they are much less active. This emphasizes the fact, already well known to organic chemists, that the two-dimensional similarity between the skeletal structures of stilboestrol and the natural oestrogens is fortuitous, and has no basis in three-dimensional reality.

Clinical reports of the activity of the new compound are now appearing. Freed and his colleagues<sup>2</sup> found that daily doses of 1 to 5 mg. by mouth gave symptomatic relief to the majority of 35 menopausal women, three of them complaining of nausea or vomiting. Hufford<sup>3</sup> was unable to

<sup>1</sup> *Endocrinology*, 1943, 32, 307.  
<sup>2</sup> *J. clin. Endocrinol.*, 1942, 2, 213.  
<sup>3</sup> *J. Amer. med. Ass.*, 1943, 123, 259.

produce such relief with daily doses of 1 mg. by mouth, but 2 to 5 mg. twice a week intramuscularly proved to be beneficial in 21 cases of surgical and natural menopause. There was no gastro-intestinal disturbance. The question of dosage was gone into in some detail by Roberts, Loeffel, and MacBryde,<sup>4</sup> who showed that even doses of 5 mg. a day only partly relieved symptoms in 50% of the cases, and that the results were not much better when doses of 15 mg. were given daily for 14-day periods with 14-day rests. These and even higher doses did not give rise to nausea or vomiting in any of their 44 patients, nor could any effect on liver function, blood, or urine be demonstrated. These authors point out that octofollin is weight for weight more expensive than stilboestrol, and 5 to 10 times less active. The advantages they claim for it are the absence of gastro-intestinal side-effects and—of theoretical interest—the fact that it does not produce leucocytosis, thrombocytopenia, or death in dogs so readily as do stilboestrol and oestradiol when administered in vast doses.

The nausea and vomiting from stilboestrol are still a vexed question. These symptoms seem to be more prevalent among American than among British patients. It cannot be too often stressed that oestrogens of the stilboestrol series are extremely active, and the doses employed are very often unnecessarily high. Stilboestrol can be obtained in tablets ranging from 0.1 mg. to 5 mg., and it is possible that an even smaller tablet should be made available. Certainly tablets of 0.1 mg. provide an ample dosage in a large number of cases. The occasional nausea and vomiting may often be overcome by lowering the dose, and cannot be attributed to any chemical property of stilboestrol *per se*, since Greene<sup>5</sup> has shown that large doses of an ester of oestradiol (oestradiol carboxylate) cause similar symptoms. It appears that nausea and vomiting and excessive oestrogen dosage go together. The absence of these symptoms in treatment with octofollin is probably due to its relative inactivity: clinicians start off with a dose that is too low and have to increase it so that adequate dosage is reached with minimal amounts of the compound. The procedure with stilboestrol is usually the other way round. The observation of Roberts and his colleagues that even in their cases successfully treated with octofollin objective signs of oestrogenic action were still lacking, in that not one of them developed an oestrous vaginal smear, shows that the dosage was indeed minimal. If symptomatic relief is attained without the production of an oestrous smear it is further evidence that stilboestrol dosage is usually too high. Taken all in all, the new compound is of theoretical interest, but its practical advantages remain to be proved.

### TRAINING NATIVE DOCTORS IN THE PACIFIC

A recent visitor to this country has been Dr. V. W. T. McGusty, Director of Medical Services, Fiji, who spoke at a London conference on developments in the training of native doctors and nurses for work in the Pacific area. Dr. McGusty, who went out to Fiji in 1912, is the head of the Central Medical and Nursing Schools at Suva, which were visited by some members of the B.M.A. during the world tour eight years ago. To appreciate the work done by the school it is necessary to bear in mind the historical background. When Fiji was opened up to white traders and settlers infectious diseases, including a virulent form of measles, and also tuberculosis, were introduced, and the population steadily declined for many years, reaching its lowest point in 1919; then it began to rise again and is still increasing. The greatest danger of the early days—the seventies of the last century—was smallpox, and Sir William MacGregor, who was chief medical officer in

Fiji at that time, imposed a quarantine and resolved to have the whole population vaccinated. As vaccinators be used young Fijians, who, after instruction, carried out the work so well that it was decided to make more use of them, and they became dispensers in the hospitals and carried out a service as medical auxiliaries. They were the forerunners of the native doctors of the archipelago to-day. In 1910 a system of training Fijian nurses was introduced, and there is now at Suva a nursing school with 100 pupils. The standard of the diploma is not equal to that of the State-registered nurse in this country, but that is because the general school education has not provided the native with sufficient educational background. The same is true of the native doctor. After the last war the International Health Division of the Rockefeller Foundation provided funds which enabled the Central Medical School at Suva in 1928 to open its doors to students from all the British administrations of the Western Pacific—Western Samoa, Cook Islands, Tonga, Gilbert and Ellice, and the Solomons, also from the condominium of the New Hebrides, and some Maoris from New Zealand. All the staff of the Suva hospital are teachers in the school, where the native students are given a four-years course in medicine, surgery, and public health. On qualifying they receive a restricted registration, having force only in the islands of the Pacific. These native doctors are not normally allowed to practise except as members of the Government service, which appears to give them the opportunity of a useful career. They provide a type of medical service within the economic capacity of the rather impoverished Fijian administration, and it is an advantage that they are of the social class of the natives themselves. The number of students in the medical school at any one time has hitherto been about 46, but it is to be increased to 76, including 8 dental students. Some of the Suva-trained doctors are already running their own hospitals. One Fijian native doctor has taken the full qualification at New Zealand University (entitling him to practise without the geographical limitation) and another is in training.

### THROMBOSIS OF CENTRAL RETINAL VEIN

Since Holman and Ploman reported favourably in 1938 on the use of heparin in thrombosis of the central vein of the retina this drug has been tried out in cases of what is generally a progressive condition. The condition, however, is relatively rare. Huggett and Juler<sup>1</sup> reported in 1942 on 7 cases and Rosengren and Stenström<sup>2</sup> have given their experience with 30 cases. Neither report bears out the early hopes; good results are exceptional. In an analysis of end-results in 32 untreated cases Huggett and Juler find that such little improvement as they noted in their 7 treated cases is paralleled by those untreated, and they stress that the administration of heparin is not without risk. Rosengren and Stenström observed improvement immediately after treatment in 21 of their cases, but this was not maintained when the patients were re-examined. These results—and early treatment does not seem to influence them materially—bear out the belief that what passes clinically as thrombosis of the central vein of the retina is frequently a blocking of the vein from intimal proliferation.

Dr. Arthur Harold Gale will deliver the Milroy Lectures before the Royal College of Physicians of London on Tuesday, Feb. 22, and Thursday, Feb. 24, at 4 p.m. at the College, Pall Mall East. Subject: "A century of changes in the mortality and incidence of the principal infections which cause death or disability in childhood."

<sup>4</sup> J. Amer. med. Ass., 1943, 123, 261.

<sup>5</sup> Amer. J. Obstet. Gynec., 1941, 42, 555.

<sup>1</sup> Trans. ophthalm. Soc. U.K., 1942, 62, 123.

<sup>2</sup> Acta ophthalm., 1942, 20, 145.

## DIPLOMA IN PHYSICAL MEDICINE

*Regulations by English Conjoint Board*

Paragraph 7 of E.M.S. Memorandum No. 6, on "The Organization of a Hospital Rehabilitation Department," issued by the Ministry of Health, reads: "Wherever possible, it is desirable that the various activities connected with rehabilitation should be under the personal supervision of a single member of the medical staff, whose duties include the maintenance of general oversight of the exercises, etc., given to patients, the prompt examination of anyone complaining of pain or other unfavourable reaction, and the holding of regular conferences with members of the rehabilitation staff. Such supervision is essential to success, and in no sense interferes with the continuity of control exercised over the individual patient by the original physician, surgeon, or obstetrician who orders rehabilitation therapy, and with whom the medical supervisor works in close association."

In this connexion it may be noted that the Conjoint Board in England has recently published the regulations for a Diploma in Physical Medicine granted jointly by the Royal College of Physicians of London and the Royal College of Surgeons of England (D.Phys. Med., R.C.P.&S.Eng.). These regulations, copies of which may be had post free from the Secretary, Examination Hall, 8, Queen Square, W.C.1, provide that (a) the examination is open to practitioners of not less than three years' standing who have held recognized hospital appointments and have completed a course of full-time special study extending over twelve months; and (b) the whole examination, which is divided into two parts, must be taken in the first instance, and subsequent admission to Part II is, of course, dependent on success in Part I. A syllabus indicating the scope of the examination is published in the regulations.

Since there may be some candidates whose experience, either in one of the Services or in the E.M.S., during the last three or four years may have been sufficient to justify their admission to the examination under the provisions of Regulation 6, arrangements are being made to conduct the examination for the first time in July next. Applications for admission to the examination under these provisions must be accompanied by original certificates (which will be returned), setting out the experience on which the application is based, and must reach the Secretary not later than Friday, June 16. The fee should not be forwarded until notification is received that the application has been approved and admission to the examination granted.

## AFTER-CARE OF SERVICE PSYCHIATRIC PATIENTS

A scheme of after-care for men and women invalided out of the Services on account of psychiatric disabilities is announced by the Board of Control. The Service Departments and the Ministries of Health, Pensions, and Labour have co-operated in drawing up the scheme, and the organization of the work in England and Wales is to be undertaken by the Provisional National Council for Mental Health in collaboration with the Mental After-Care Association. The scheme will cover neurotics, psychoneurotics, and psychotics who no longer require in-patient treatment but who need further medical treatment and advice or help in finding employment or in adjusting themselves to civilian life. Officers commanding Service psychiatric hospitals and establishments and the medical superintendents of E.M.S. Neurosis Centres will notify the Board of any patient about to be discharged from the Services and returning to an address in England or Wales who needs after-care and is willing to receive it. This notification, accompanied by a report from a trained social worker allocated to each of the hospitals and centres by the Provisional National Council, will be forwarded by the Board to the P.N.C. to be dealt with by the latter's regional social worker. This officer will visit the patient at home and take any further steps necessary, acting in co-operation with the patient's own doctor and the local authorities and Government Departments concerned. A scheme on similar lines is being organized by the General Board of Control in Scotland, and one is under consideration for Northern Ireland.

The first series of scholarships for nurses which the Hospital Saving Association is providing out of its 21st birthday funds (July 31, 1943, p. 147) will consist of two scholarships for nurse dicticians of approximately £250 each; four for nurse teachers of £200 each; four for health visitors of £105 each; twelve for industrial nurses of £65 each; and four for midwife teachers of £75 each. They will be awarded annually over the next four years, will be open to nurses who are on the general part of the State register and have trained in hospitals within the area of King Edward's Hospital Fund, and will be available at any of the recognized training centres. Candidates will be required to sit for a competitive examination. Application forms may be obtained from the Royal College of Nursing, 1a, Henrietta Place, Cavendish Square, W.1.

## Reports of Societies

## PHYSIOLOGY OF FAINTING

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland in Dublin last November, with the president of the section, Prof. E. J. CONWAY, in the chair, H. BARCROFT, O. G. EDHOLM, J. MCMICHAEL, and E. P. SHARPEY-SCHAFER presented a paper on changes in the circulation during fainting.

At the onset of fainting, it was observed, the heart slowed and the blood pressure fell steeply to a low level. Measurement of the cardiac output by the direct Fick method in seven subjects showed that during fainting cardiac output was not further diminished and might increase. The fall of blood pressure was therefore not of cardiac origin, but was due to vasodilatation. In a further investigation of the effects of a controlled haemorrhage of approximately three-quarters of a litre, three subjects fainted while the forearm blood flow was being recorded by the Lewis Grant plethysmographic method. In all cases forearm flow increased during fainting. The combination of increased forearm flow and fall in blood pressure signified marked vasodilatation in the forearm during fainting. In view of the intense pallor of the skin the site of the vasodilatation was likely to be in the skeletal muscle.

In another series of experiments the effect of sympathectomy was produced by anaesthetizing the deep nerves to the forearm musculature. There was a high initial blood flow, as all vasoconstrictor impulses were removed. During fainting the blood flow fell steeply with the descent of the blood pressure, and recovered as the blood pressure rose. It was concluded that the fall of blood pressure in fainting was due to a peripheral vasodilatation of muscle vessels, and that the dilatation was of nervous origin.

## Nerves in Joints

Prof. M. A. MACCONAILL, in a paper on nerves in joints, said that the following conclusions appeared to be justified by the results of the methylene-blue technique of G. Weddell:

1. The synovial membrane is everywhere a sensitive membrane, but not one with so high a degree of localization as the skin.
2. Both pain and phasic sensations are subserved by the intra-articular structures, including the menisci.
3. The fatty pads (Haversian glands) are structurally fit to act as manometers of intra-articular pressure, in addition to their function as stream-lining elements of the joint cavity.
4. The arterial vessels, especially those of the fatty pads, have a liberal nerve supply, including adventitial nerves; this supply ceases at the capillary level.
5. The nerve-endings observed were of the non-encapsulated type only, even those on the special ligaments. Musculo-tendinous endings of the Golgi-Mazzoni kind were, on the contrary, seen at the musculo-capsular junctions of the extensor genu muscles.

## SQUINT

At a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health in January, with the President, Dr. MARJORIE BACK, in the chair, Mr. C. L. GIMBLETT spoke on squint, and Miss IRVINE, senior orthoptist, R.A.F., demonstrated the synoptophore.

Mr. Gimblett showed how the various theories concerning the cause of squint could not be made to fit in with the facts until binocular vision was taken into consideration. Mr. Claude Worth had discovered three stages of binocular vision in the squinting child: (1) simultaneous perception; (2) fusion; (3) stereoscopic vision. In answer to questions Mr. Gimblett said that all cases of squint were not suitable for orthoptic treatment. Rest periods were given at suitable intervals, but the young child was not discharged from the orthoptic department until he could read and be trained to accommodate properly. The ideal age for orthoptic treatment was 5 to 8 years, but a child should be sent for examination as soon as the squint was noticed. Any error of refraction should be corrected and amblyopia prevented. If the squint was neglected for two or three years, then much of the time spent in the orthoptic department would be taken up in improving vision in the amblyopic eye. Vision in the worse eye must be at least 6/12 before orthoptic treatment could be started.

## Correspondence

### Dietary Injury of the Liver

SIR.—We have read with interest in your issue of Jan. 29 the article by Dr. Joseph Gillman entitled "Effects on Rats of Prolonged Feeding with the Staple African Diet." Dr. Gillman reports that rats given a diet of maize meal and sour milk develop a "nodular cirrhosis" of the liver, which usually involves the left lobes of the organ. We have produced a similar lesion by means of diet. The lesion in question, however, is not a cirrhosis in the strict sense of portal cirrhosis; it is the condition of nodular hyperplasia, and it is the sequel to massive hepatic necrosis. In our animals we have produced every stage of the lesion from acute yellow atrophy through post-necrotic scarring to nodular hyperplasia. We have been able to show that this massive hepatic necrosis, with its sequel of nodular hyperplasia, is a deficiency disease due to lack of a constituent of protein, and that according to the degree of deficiency the condition involves the whole organ or only the left lobes. The experimental results giving the proof of this statement are now in the press and will be published shortly. —We are, etc.,

H. P. HIMS WORTH.  
L. E. GLYNN.

U.C.H. Medical School, London, W.C.1

### Research in Ophthalmology

SIR.—Because of its essential truth no critical reply to your admirable annotation on research in ophthalmology appeared to be called for. At the same time there is much to be said on the issues raised by Mr. Lionel Green (Jan. 29, p. 158). These are research, the conditions of hospital appointments, and postgraduate training. He advocates the creation of a central co-ordinating institution, and many ophthalmic surgeons who have given consideration to these matters will agree that an active voluntary body of this nature would be of great value. The practical application of basic research is seldom found within a decade, and may meet violent opposition from vested professional interests. Even in clinical matters progress may be slow—for example, squint has been treated with stereoscopic devices for over a hundred years and the term "orthophthalmic practice" was applied to this form of treatment in 1841. The orthoptic board came into being some ninety years later.

Much basic ophthalmic research has been carried out during the past decade in this country, but not by clinicians. If the approval of this state of affairs had been only tacit, it is unlikely that during the period foundations designed to remedy the defect would have been established in Edinburgh, Glasgow, London, and Oxford. In each case close collaboration is maintained with hospitals and laboratories, and already from these areas the output of work is notably increasing. Some of this research is referred to in your leading article. These foundations are not restricted in nature and they are not isolated. More than a genuine interest in the academic side is required before the clinical ophthalmologist is likely to contribute anything to basic ophthalmic research. The combination of qualities required is not a common one. To give one example, all over the world a few clinical observers are anxiously awaiting the discovery of a sex-linked blood group. The response of medical ophthalmic practitioners to such a discovery would not be an immediate one. It might take at least a decade before they would realize its significance. There is nothing derogatory in this; it means that basic observations have a different appeal to different types of observer.

Most specialties in this country have historical associations with one or other of the Royal Corporations. In ophthalmology the recognition of the M.R.C.P. for responsible appointments in London would be a practicable step which might meet some of the difficulties. The position is rather different in Scotland, where greater weight is attached to university qualifications than is the case in England. The statutory recognition of exclusive specialist bodies within the medical profession is not likely, and would tend to perpetuate rather than diminish the very real disabilities to which attention has been drawn by

your correspondent. There is a branch of medicine devoted to ophthalmology, but I hope that this will never become an "ophthalmic profession."

The present position regarding all higher qualifications is, of course, at present under review. It is certainly confusing. The young ophthalmologist can take at least three diplomas in ophthalmology and three surgical fellowships with his specialty as a part of the examination. The majority collect only those which are necessary for the areas in which they propose to practise. If the younger men are not correctly advised, much time may be wasted and unhappiness arise. A similar position may occur in other branches of medicine, and might be greatly improved by the creation of a common conjoint examining board of all the bodies concerned in granting such diplomas, with a system of exchange examinations. This would ultimately lead to uniformity, and the candidate could attain either fellowship or membership standard. —I am, etc.,

University of Glasgow.

W. J. B. RIDDELL.

### Qualities and Limitations of Proflavine

SIR.—I have been much interested in recent discussions upon the use of proflavine in the treatment of wounds. There has been a good deal of adverse criticism of it, which I believe is due to a misunderstanding of the limitations of this most useful and non-irritating antiseptic.

I have used proflavine very extensively over many years—both in hospital and in private practice—ever since it was first brought to my notice by Prof. Carl Browning, the discoverer of proflavine and at that time professor of pathology at the Middlesex Hospital. I speedily found it by far the most efficient and satisfactory antiseptic I had ever come across, and I came to use it as a routine dressing in all ophthalmic operations, its great value lying in its strong bactericidal qualities coupled with its being completely painless and non-irritating. I always used it in a strength not exceeding 1 in 2,000, and this solution was sprinkled freely upon the gamgee dressing, while on completion of the operation I always freely doused the eye with the solution before applying the dressing. By this simple method it was possible to avoid with certainty that bugbear of ophthalmic operations—viz., contamination from the lash area. One can use a solution of 1 in 1,000 with equal safety, but as I experienced ample protection with the weaker strength I preferred the latter.

Proflavine, however, has very pronounced limitations. In the first place it is purely an antiseptic in the true sense of the word, and is not a remedy to employ when infection is already obviously present. Thus it is a bad drug to use in acute purulent or semi-purulent inflammations, because it has little or no penetrative power. Moreover, its usefulness is not in a direct ratio with the strength of the solution employed; on the contrary, I found that no advantage was gained by using solutions stronger than 1 in 1,000, and, in fact, even at that concentration it was liable, if used continuously over more than a very short period, to inhibit the healing of a wound. In a still stronger solution I can well believe it becomes increasingly unsatisfactory, and its combination as a powder with sulphathiazole, which has been tried with very unsatisfactory results, is entirely contraindicated. In short, proflavine cannot be surpassed when the object is to prevent contamination from an outside source, but is inferior to other remedies when one has to deal with any widespread infection already present.

As regards the value of acriflavine as compared with proflavine, I formed a very definite impression that while acriflavine is just as efficacious in its antiseptic properties as proflavine, it is apt sometimes to cause irritation, which proflavine never does when used as I have suggested. —I am, etc.,

London, W.1.

ARNOLD LAWSON.

### Suprapubic Cystostomy in Bladder Paralysis

SIR.—In spite of the teaching of the majority of urologists there are still surgeons who advocate the tied-in catheter instead of an early suprapubic cystostomy for the treatment of the paralysed bladder. The authors of an article on fractures of the spine published in a recent issue of an important journal of surgery show such a lack of knowledge of the dangers of

how he treads in future, or he may lose an intervertebral disk. One wonders how many doctors and orthopaedic surgeons with sciatica would sacrifice a disk.—I am, etc.,

Rotherham.

ERIC COLDREY.

SIR,—The analogy between shingles and sciatica is too close to exclude the possibility of both these conditions being akin. By sciatica I mean the sudden crippling pain along the course of the sciatic nerve which goes after a week or two "on the club," from which the patient recovers totally, whether assisted by our remedies or not, but in which the pain is acute enough to need a pain-killer, at times even morphine injections. This sciatic pain comes on suddenly; often the patient complains of a "chill," which, I take it, is fever, and at times the temperature is raised. The pain is invariably unilateral, as is the pain in shingles. Any continued pain in both sciatic regions would not be called sciatica by a general practitioner, but would promptly raise the suspicion that something serious was responsible.

I have never known a patient die from what I recognize as sciatica, and whether there is anything known of the pathological condition I do not know. I doubt if there is any pathological evidence. I certainly think that there is some ground for believing that possibly a virus, such as causes a common cold, may at times attack some element in the lower cord, as happens in shingles in various parts of the body. Certainly none of the theories so far explains the invariable one-sidedness of the condition or the invariable complete recovery. In fact one may say that if recovery does not happen in a week or two the condition is not "sciatica," but one of the various conditions so far mentioned by your correspondents.—I am, etc.,

Crewe.

W. L. ENGLISH.

### More Light on the B. Complex

SIR,—The following remarks are prompted by the annotation on this subject in the *Journal* of Jan. 15 (p. 85).

In a series of communications during the last 20 years (for references vide McGowan, 1942) I describe a condition in young pigs—"iron deficiency"—caused by a relative deficiency of iron in the mother sow's milk. It appears in suckling pigs during the first 3 or 4 weeks of life, and is characterized by white diarrhoea, pallor of skin, adiposity, and anaemia, with fatty change in and subsequent disappearance of the cells of the central areas of the liver lobules. The condition is preventable, and curable in its early stages, by the administration of iron. If, however, it is allowed to run its course unchecked, one of the major sequelae which develop in certain cases is another type of anaemia, due to the progressive destruction of the liver lobules from the centre outwards. This anaemia is unaffected by treatment with iron, but responds in dramatic fashion to the administration of liver or liver extract. The symptoms comprise pallor—sometimes there is jaundice—anorexia, vomiting, cyanosis, dyspnoea or "thumps," and often sudden death. There is some emaciation without, however, lack of skeletal growth.

Chick *et al.* (1938), on finding that a condition in the pig resembling that just described was curable by the administration of nicotinic acid, alleged that it was pellagra. I pointed out, however (1938, 1939), that the onus of showing that it was not simply this "iron deficiency" sequela rested on them. The same obligation would seem to be binding on Wintrobe *et al.* (1942) in their study of thiamine deficiency in swine. The symptoms as described are those of the "iron deficiency" sequela—"anaemia of moderate or even severe degree was observed in several pigs" (p. 148); as estimated on only one occasion, and this at the time of death, the red blood cell count in 17 pigs was (with one exception in each of the 4 groups) definitely, sometimes markedly, below normal. Haemoglobin was not determined in any of the cases at any stage. The statement, apparently based on naked-eye observation, that "no chronic passive congestion of the liver was found" (p. 156), while an incorrect description of the pathology of the liver changes to be looked for in "iron deficiency," does not exclude the possibility that changes, past or present, of the liver parenchyma might have been observed if a microscopical examination had been made. Moreover—and this is very important—the pigs were weaned and fed on a highly unnatural diet at

3 weeks of age—that is to say, very early in life at a time when milk should still constitute the major portion of their diet, and, further, at a very critical stage of their existence, when, if this "iron deficiency," possibly well established during the previous 3 weeks, were to be prevented from further development, a diet of natural foodstuffs and one containing a large amount of iron was an absolute necessity. The statement by Wintrobe *et al.* (1940) that the pigs frequently had diarrhoea during the first few weeks of weaning supports, if indeed it does not prove, this thesis.

Such cases are examples, additional to those provided elsewhere (1939a); illustrative of the fallacy of concluding that because a substance cures or ameliorates a condition the previous absence of the substance (from the diet) must have brought it about. They also emphasize the importance of ensuring that experimental animals are quite healthy before being subjected to experiment. I cite (1941) a case in which rabbits, suffering from acute intestinal coccidiosis, were employed in observations from the results of which it was alleged that the addition of calcium to a ration of barley and bran conferred on the rabbits receiving it protection from the effects of an intravenous injection of human tubercle bacilli. I also refer (1933, 1940) to instances where the possibility could not be excluded that pigs and puppies, regarded as normal and healthy and employed for experiments on rickets, were suffering from latent rickets already before being subjected to experiment.—I am, etc.,

Aberdeen.

J. P. MCGOWAN.

### REFERENCES

- Chick *et al.* (1938). *Biochem. J.*, **32**, 10.
- McGowan (1933). *British Medical Journal*, **2**, 599.
- (1938). *Ibid.*, **1**, 917.
- (1939a). *Ibid.*, **1**, 297.
- (1939b). *Nature*, **144**, 244.
- (1940). *Edinb. med. J.*, **47**, 204, 425.
- (1941). *British Medical Journal*, **1**, 172.
- (1942). *Edinb. med. J.*, **49**, 568.
- Wintrobe *et al.* (1940). *Johns Hopk. Hosp. Bull.*, **67**, 381.
- (1942). *Ibid.*, **71**, 141.

### Treatment of Chronic Nephritis by Serum Transfusion

SIR,—The importance of serum transfusions in shock and haemorrhage has been well established. In chronic nephritis—or "nephrosis," a word I prefer to indicate this pathological condition—we have to deal with a leak of protein through the damaged kidney. In these cases we restrict the protein intake, but forget that protein can still be obtained from and at the expense of the body cells; in this way we increase the oedema.

Clearly, therefore, the method of treatment for this apparently hopeless condition is to give repeated transfusions of human or bovine serum intravenously or, in children, into the bone marrow of the tibia. I would like to stress the last point, as so often futile attempts are made to find a suitable vein in infants.—I am, etc.,

Southport.

JOHN H. HANNAN.

\*\* In the *Journal* of April 25, 1942, we published a paper by H. Brown, C. H. Gray, and P. L. Mollison entitled "Treatment of the Nephrotic Syndrome with Serum Transfusions." The authors concluded that "in the nephrotic stage of glomerulonephritis a transfusion of concentrated serum is as likely to be followed by an adverse as by a favourable effect."—Ed., *B.M.J.*

### Malaria in British Troops in West Africa

SIR,—I read the article on this subject by Capt. S. B. Hugl and Lieut.-Col. R. R. Bomford (Jan. 15, p. 69) with great interest and appreciation, and feel that they have done service in emphasizing the importance of recognizing the mild clinical types of the disease.

From experience on a smaller scale in another part of "the Coast," I feel the correct emphasis in teaching should be the protean milder manifestations of the disease. How well I remember a number of cases originally treated, while relatively afebrile and in the absence of positive blood findings, bronchitis or rheumatism, but which were later diagnosed subtertian malaria! A common experience was to find the malarial symptoms masked by exacerbation of chronic disease such as tonsillitis. While no experienced practitioner in the Tropics would overlook malaria in such a case, it is possible



that many potentially dangerous attacks of subtertian malaria masked in this way may go untreated in Service personnel returned to the United Kingdom. If no malaria parasites can be found in the blood films, an unusually high B.S.R. with increased monocyte count is often a guide.

With regard to the various clinical types not repeating themselves in the same individual, I can recall one patient each of whose three attacks took the form of very severe gastro-enteritis, but he may have been an exception. But it was noticeable that a series of cases occurring within a few days would conform to the same clinical pattern. This is possibly due to infection by the same mosquito, and consequently the same strain of parasite.

"Malaria-conscious" officers and N.C.O.s make prevention much more efficient, but strict disciplinary measures appear to be necessary, even now, to enforce the wearing of antimosquito clothing by all.—I am, etc.,

J. SANDILANDS, \*  
Temp Surg Lieut-Comdr, R.N.A.R.

### Population Problems of India

SIR.—The recommendations of the Hot Springs Conference are important, because they are the only concrete plans for real improvement of the standard of living throughout the world that have been proposed up to now. The difficulties involved therefore deserve careful consideration. I do not think that your correspondents have answered Prof. Blacklock's article. The food supply of India cannot be considered solely in terms of calories. The standard of diet proposed by the Hot Springs Conference involves a change from a diet that is largely cereal to one in which some 70% of the calories are derived from other foodstuffs. An acre of land producing these foodstuffs yields far fewer calories than when it produces cereals. That is why the diet at present is so largely cereal. It is true that a change to mixed farming, irrigation, the use of fertilizers, etc., would increase the fertility of the soil. It is not possible to work out exactly the possible yields in terms of calories or any other nutrient. But undoubtedly India could not supply a population much larger than at present with a satisfactory diet.

Comparison with Britain is invalid. Britain is, so to speak, an industrial town dependent on agricultural areas abroad. It is not possible for every country in the world to produce only two-thirds (or, as now, one-third) of its food. And even in Britain more of the foods that give a low yield per acre are needed in order to bring the average consumption to a satisfactory level.

The danger is that with an improvement in the standard of living and consequent fall in the death rate the food supply will never catch up with the population. This problem may not be insoluble, but it does exist; the people of India must find their solution. This is only one of the difficulties which are raised by the proposals of the Hot Springs Conference; another is the conflict between the demand for national sovereignty and the need to co-ordinate purchasing power and food production throughout the world.

I hope that no one will infer that I am anything but enthusiastically in favour of the Hot Springs programme; or that I regard famine and war as "Nature's pruning hook"; or that I want to maintain our standard of food at the expense of other peoples; or that I wish to dictate the reproductive habits of the people of India. But we have had one lesson in the consequences of promises made without thought of the difficulties involved in their fulfilment; I do not want to see another.—I am, etc.,

JOHN MARRACK.

The London Hospital, E.1

SIR.—It is to be hoped that Prof. Blacklock's soberly objective article on the population problem of India will not be allowed to become buried under a storm of abuse actuated by political or religious motives.

Experts differ as to the potential wealth of India, but even if the most optimistic estimate be accepted, the development of these potential resources must surely precede the increase in population they are expected to support. Since the reverse has been allowed to happen (present birth rate 34, death rate 22 per 1,000) it is not surprising that famine conditions are endemic in the country. The whole process is a pitifully waste-

ful one. It would seem not unreasonable to suggest that each medical centre (aimed at reducing the death rate) should include a birth control clinic, though admittedly their chances of success in either direction cannot be spectacular while the population remains largely illiterate (73% in 1941).—I am, etc.,

Leatherhead.

M. GRACE EGGLETON.

### Teaching of Anaesthetics

SIR.—While I am in agreement with many of the points raised by Dr. Lloyd-Williams (Dec. 25, p. 827) and Dr. Philip Ayre (Jan. 22, p. 127) as to the future teaching of anaesthesia, I would go further and suggest that practical instruction (as distinct from theoretical) for major operations should be abandoned altogether. A surgical dresser is taught how to deal with an acute abdomen, but is not expected immediately after qualification to operate on such a case, whereas it is more than possible that he will be asked to anaesthetize one. The essential point to my mind is whether the practice of anaesthesia is to be regarded as a specialty or not. If it is, it should be treated in the same way as all other specialized branches of medicine, and be confined to practitioners with special qualifications. Until the medical profession as a whole regards it in this light the present unsatisfactory position will continue. Surgeons themselves are partially responsible for the present anomalous state of affairs by permitting general practitioners to anaesthetize their own cases.

It may be said that there are not enough specialist anaesthetists to go round, but if a sharp distinction were made between anaesthetics for major and for minor operations, and only specialists allowed to handle the former, the minor cases could probably be safely dealt with by the newly qualified house officer and the general practitioner. If students could only be persuaded to forgo the glamour of the operating theatre and to attend dental out-patients and the casualty department, they would obtain a much sounder knowledge of the elements of anaesthesia. This should be supplemented by an adequate course of lectures, while the practical teaching of anaesthesia for major surgery should be entirely postgraduate.—I am, etc.,

London, W.1

MASSEY DAWKINS

### The Record in Urinary Calculi

SIR.—Mr. J. Armstrong's 58 urinary calculi make a very pretty picture, but I am afraid it is very far from being a record. In a paper published in 1934 (*Lancet*, July 28, p. 193) on "Stone in the Lower Urinary Tract in India" I gave details of a case in which I removed 635 stones from the bladder of a very ancient Hindu. The following is a cutting from a reprint of the article.

"Case 1.—This must be, I think, something of a record. An old man was admitted with some pain on micturition and slight pain in the lower abdomen. Palpation revealed a mass in the subumbilical region, tender on pressure. A sound could only be passed into the bladder with difficulty. Radioscopy showed a hazy, ill-defined shadow. On opening the bladder it was found to be absolutely full of small stones, the largest not being bigger than a small nut, and the greater number being the size of a small pea or less. The opening in the bladder was enlarged and the stones removed by the aid of a spoon. There were found to be 635 stones of all sizes. The bladder was entirely filled with them, and there could have been very little room for urine. How many years the old man had taken to accumulate such a vast quantity can only be left to the imagination. The bladder was closed in the usual way, and recovery was uneventful."

Whether this number constitutes a record I do not know, but it must be very near it. It is the equivalent of laying down a fresh stone every month for 53 years. Incredible as this may seem, it is even more astonishing that a man could exist for so many years in the discomfort which such a condition must have entailed without seeking advice. India is, however, full of such surprises. At the other end of the age incidence of urinary calculi, the youngest child from whom I removed a bladder stone was aged 6 months, the stone being the size of a hazel nut. This again is far from being a record, stones having been removed from babies as young as 3 weeks. The obvious inference is that they are sometimes laid down *in utero*.—I am, etc.,

Croydon.

RUFUS C. THOMAS.

### Treatment of Infective Hepatitis with Glucose, Insulin, and Ascorbic Acid

SIR.—One of the chief problems in dealing with cases of infective hepatitis in the Services is the time spent in hospital by patients suffering from this disease. So it was noted with great interest that MacDonald (Aug. 28, p. 261) claimed to have hastened recovery in cases treated by him with glucose, insulin, and ascorbic acid. In view of this it was considered justifiable to try a course of treatment consisting of 10 units of insulin twice a day, 25 mg. of vitamin C three times a day, and at least 5 oz. of glucose spread over the whole day. Ten patients were given this treatment and ten were treated as controls, all receiving a fat-free diet and sodium sulphate.

The duration of symptoms before admission was noted in each case, and the treatment was continued till the urine was free from bile; the total duration of the disease was calculated from the beginning of the first period to the end of the second. The total duration in those cases treated with insulin, vitamin C, and glucose was 10, 9, 10, 10, 13, 9, 9, 11, 17, and 14 days respectively, with an average of 11.2 days. The total duration in the other cases was 12, 11, 12, 18, 15, 18, 17, 7, 8, and 13 respectively, with an average of 13.1 days.

There is obviously no significant shortening of the duration of the disease by the insulin and vitamin C method of treatment, although the number of cases treated is small. It does not seem justifiable to use a treatment such as this unless its effects were profound, owing to the difficulty of obtaining insulin. On the other hand, it was noticed in cases so treated that they definitely improved subjectively at an earlier date than the controls, and suffered less from anorexia and nausea. This suggests that this treatment might be confined to those few cases in which the symptoms, especially vomiting, become severe and indicate a spread of liver damage. Differential blood counts were done on all these cases and showed without exception a relative increase in the lymphocytes.—I am, etc.,

N. S. GORDON,  
Fl. Licul., R.A.F.V.R.

### School Medical Service

SIR.—In reply to Dr. Turner's letter (Jan. 29, p. 161), he will find that the section to which he refers—Section 122 of the Children's Act, 1908—was repealed in the Seventh Schedule to the Education Act, 1921, and its provisions were incorporated in the latter Act. This Act, in turn, will be repealed when the new one comes into force.

I would also like to draw the attention of medical officers to Clauses 31 and 32 of the Education Bill, where the words "serious" and "nature and extent" appear. From this it would seem that it is the intention that no children in the future shall be admitted to special schools unless the medical officers consider that their conditions are serious, and that medical officers making any such recommendations must be prepared to supply the parents and the education committee with certificates stating the nature and extent of the defects. Children requiring special-school education may be suffering from defects of the eyes, ears, lungs, or heart, or orthopaedic or mental conditions. Since doctors making recommendations for children's attendance at special schools may be called upon to give certificates stating the nature and extent of the defects, they would have to possess specialist knowledge in all branches of medicine and surgery in order to do so. As these certificates have only to be given when required, presumably they will only be asked for when objection is taken to the recommendations.

To demonstrate the awkward situation in which a doctor would be placed through it being made his duty to state in his certificate the nature of the defect, the imaginary example may be taken of a councillor's child suffering from seriously defective vision as a result of interstitial keratitis. The doctor would be forced to state in the certificate to be given to the parents and to the members of the education committee that the child's seriously defective vision was the result of congenital syphilis. In cases of paralysis it would be the doctor's legal obligation to give the extent of the paralysis by specifying the names of the particular muscles involved. If the words "nature and extent" are retained, too heavy a responsibility will be placed on school medical officers, and will result in

large numbers of suitable cases not being recommended for special schools because the doctors consider it undesirable to disclose the nature, or feel that they have not the requisite specialized knowledge to state the extent, of the defect.

The open-air schools have in the past perhaps done as much valuable work as any of the special schools. As, however, the cases admitted to these schools cannot be classified as serious, it is presumed that under the new Act the intention is to abolish such schools.—I am, etc.,

Liverpool.

R. GAMLIN.

\* \* \* We have received several other letters pointing out that Section 122 of the Children's Act, 1908, was repealed in the Education Act, 1921.—ED., *B.M.J.*

### Shock Therapy

SIR.—I should be grateful if you would allow me to reply to the letters that have followed mine of Dec. 25. Most of these letters have been from psychiatrists, and this has disappointed me, since my aim was to sound the opinion of the profession as a whole. The general practitioner is probably too busy at present even to read letters, and yet I think his opinion on specialist practice should constantly be sought by specialists, if for no other reason than that the G.P. himself lives among his patients, among the therapeutic failures as well as among the successes.

I am well aware that a certain number of psychiatrists who are students of human nature are using various kinds of shock therapy as an adjunct to their psychotherapeutic work. These have nothing to fear from a letter from me to the medical press. They will continue their work, retaining, modifying, and discarding according to their careful observation of effects. Quite different from this is the idea which is developing that the treatment of mental disorder is shock treatment of one kind or another, and that this is something which can be ordered and given like chemotherapy in the case of septicaemia. No treatment of mental disorder will ever be invented which can be properly practised by anyone but a student of human nature. My letter has had some value in that it has produced an authoritative statement that shock therapy (of whatever kind) is not a treatment in itself. The opinion which I expressed—that shock therapy of mental disorder (even if it can be valuable in good hands) is a serious setback to the health of psychiatry—is strictly a personal one, and it is only fair to my psycho-analytic colleagues for me to make it clear that my letter expressed only my personal feeling.

Several of those whose letters were published assumed that I had psycho-analysis in my mind as an alternative to shock therapy. As a matter of fact I did not mention the word, though it is true that my training has been in the psycho-analytic discipline. The alternative which I am advocating is good general management, good personal doctoring and nursing, with toleration of therapeutic failure. This is extremely difficult to put into practice in the case of hopeless psychiatric material; but for every hopeless case there are hundreds, or rather thousands, of hopeful cases, and it is for them that we must plan psychiatric practice. This may sound surprising to some institution psychiatrists, but general practitioners will understand what I mean when I say this—that when medical science is able to control the physical part of certain common conditions, such as influenza, rheumatism, and high blood pressure, a great deal of serious depression, paranoia, and chronic hypomania will be revealed. This will have to be treated as "flu and rheumatism and high blood pressure have always been treated—by personal doctoring and nursing. One of the really useful things the psychiatrists used to teach us was that depression phases tend to pass spontaneously with no more than an intelligent toleration of the condition on the part of those caring for the patient, watch being kept for suicidal attempts, deliberate or accidental. Freud made this teaching understandable by pointing out the relation of melancholia to normal mourning, which has its term and from which recovery can be expected. If the psychiatrists are really concerned to give help they can do so very much more than (with notable exceptions) they do now about occupation therapy. Perhaps the term "occupation therapy" is unfortunate, because it reminds one of the proverb about "idle hands," whereas a better term would indicate that what is wanted is a specialized form of

vocational guidance which gives subjective reality its proper place alongside the patient's relation to the external world.

One might have been content to let research into the value of shock therapy take its own course if it had not been for a certain communication which I received with regard to post-war planning. I was told that when peace comes an institution will be set aside for psychiatric illness in childhood, in which psychotic children will be treated by shock therapy. Just like that. Now my friend Dr. Rogerson may be gravely in error in thinking that psychosis in childhood is rare. In my opinion it is common. What schizophrenia and depression and paranoia and hypomania look like in childhood is a matter outside the scope of this letter, but the point is that the vast majority of cases recover spontaneously with right management, or, at any rate, manage to find some way of life which suits the type of personality. Those who use shock therapy in the treatment of adults generously admit that they have no idea how it works when it does work. I hoped by mobilizing general medical opinion to make it impossible in England for this research to be done on children.—I am, etc.,

London, W 1

D. W. WINNICOTT.

SIR.—There is nothing to be ashamed of in empirical medicine. But with the enormous strides in the scientific field it is inevitable that the sincere clinician must wish to know *how* he has attained results in his patients; it is not sufficient just to cure them. In other words, he must have some scientific framework of pathology or psychopathology within which to fit his clinical facts, and seek to explain any cure or attempt at cure with the language of his theory.

But let us remember that our psychopathology arose out of carefully observed clinical facts. In effect the critics of electric convulsant therapy are upset because they seek to cure with "love," and the exponents of E.C.T. are alleviating certain types of mental disorder with what appears to be "hate" methods. Each side is using the opposite antinomy of the original love-hate dualism. But do not Freudians get their results in depth analyses through the expression of the instinctual hate-impulses during the real negative (projection) transference phase?

Most of us can recollect some antisocial individual who has changed his ways without treatment of any specific kind through the effect on himself of another's example, so *shocking* that it had the effect of making him afraid of becoming likewise, and so hating his own way of life. If we don't like getting good or bad results without knowing sufficiently how these came about we shall, of course, criticize the same thing in others. The real danger we fear is (apart from inflicting actual physical lesions) lest any method becomes a "magic" to be used haphazard and carelessly in unsuitable cases.—I am, etc.,

London, N.W. 5.

J. C. MACKWOOD.

SIR.—Dr. Winnicott's letter on convulsion therapy has started a red herring which, so to speak, is careering across the psychiatric terrain with the hounds in full pursuit. Accordingly a good deal of speculative and irrelevant comment has been evoked to befog the issue.

Admittedly the treatment is purely empirical, has no rationale, and was based originally upon a misconception. It will consequently tend to disconcert and repel the scientifically trained mind. But clearly, as against this, first importance must be given to the fact that it works—it is often brilliantly effective—in a considerable proportion of cases. Does Dr. Winnicott seriously contend that in spite of successful results a treatment should be discarded if we do not know how it acts? This all-important question of results receives no mention in his letter. It is the theoretical aspect entirely that alarms him. The treatment, he thinks, is too violent (experience shows that it is not); the patient probably consents from an impulse akin to a suicidal one (this is not uncommon in other forms of treatment as well); it gives scope to the doctor's unconscious antagonism (does this not happen in psychotherapy too?); it offers a by-pass to true understanding of human nature (understanding is not enough without the power to alleviate). To bring in psychotherapy as the alternative is obviously irrelevant, as it is well known that the cases responding best to electrical convulsion treatment are as a rule unsuited for and inaccessible to analytical forms of psychotherapy.

In the evolution of medicine there is bound to be a place for the random discovery. After over 5 years' extensive trial of convulsion therapy one is surely compelled to emphasize how it has justified itself in the amount of suffering it has relieved, already very great. The attempt by theoretical objections to throw discredit upon a valuable form of treatment is likely only to result in discrediting those who make use of them. Their critical attitude is strangely reminiscent of the early opposition to psycho-analysis.—I am, etc.,

London, W 1.

FREDERICK DILLON.

### The Prisoner-of-War Mentality

SIR.—Nobody could regret more than I that my communication of Jan. 15 last should be depressing; we should thank Col. L. W. Harrison for trying to lighten the gloom. But in support of my previous statements I should like to refer him to Mr. Eden's comprehensive review on the matter in the House of Commons on Jan. 28. Commenting on communications received in this country from prisoners in Japanese hands, which universally suggest that the writers are being well cared for and are in good health, he says: "There is no doubt from what we know about particular areas that some of these communications at any rate are in terms dictated by the Japanese authorities"; and "... the true state of affairs is a very different one so far as the great majority of the prisoners in Japanese hands is concerned."

The point I wished to emphasize was that while we are indebted to Major P. H. Newman for correlating some material facts with psychological theory, we now have very many more, and awful, material facts on which we should have to base any future psychological treatment.

I am convinced that the Western mind has yet to grasp the Japanese mentality and its baneful influence. I would even go further and say that nothing, so far as I am aware, is being done officially or otherwise to enlighten our ignorance on the subject.—I am, etc.,

Peter Wood.

B. RICHARDSON BILLINGS.

### The Mosley Incident

SIR.—I do not intend to express an opinion one way or the other on the Mosley incident. But Sir Farquhar Buzzard's letter raises a most important point. He utters a protest—albeit rather a belated one—at the loss of professional secrecy which every patient should be able to claim as a right. I am afraid Sir Farquhar is a trifle behind the times. The average citizen has no such right to-day.

The bare expression of a medical attendant's opinion without a detailed statement as to what disease the patient is suffering from would not be sufficient to claim him exemption from fire watching, Civil Defence volunteer duty, or his wife exemption from forced service in a factory. On the contrary, the medical attendant has to allude to the disease—details of which must be submitted, and are scrutinized and even criticized by lay officials at Labour Exchanges. Suppose an unmarried mother were to make a statement to me as to her pregnancy, the bald statement "In my opinion her life would be endangered (or her health endangered) by her work in a factory or other form of National Service" would not be accepted by a National Service officer. On the contrary, such officials are encouraged by the Ministry of Labour to make searching inquiries into the actual disease or condition and its consequences. Further, they are even supplied with a glossary of medical terms to help them in their investigations. They frequently discuss the patient's health before a committee (composed of lay persons, and, in one instance known to me, such persons were neighbours of the unfortunate patient).

I once referred a patient back to the Labour Exchange because by virtue of brachial neuritis she was unable to work in a first-aid post. She was referred to a lay committee of the Labour Exchange, all of whom discussed her case openly, and one even went so far as to suggest that her past treatment had been useless! Another patient referred by a doctor for exemption on account of a major operation (hysterectomy) was told by a Labour Exchange official: "That oughtn't to take more than three weeks!" I may ask how much professional secrecy existed here.

I could supply many more instances, but perhaps the best of all is the following. A married woman who was pregnant brought in a certificate for exemption. Being nervous, she murmured the contents in a low voice, and was greeted by the woman official with these words: "Come on, now! Speak up! What is your condition?" Adding in a voice of thunder: "You're pregnant, aren't you?" The entire room could hear this effort. I trust Sir Farquhar would have voiced his indignation as I did. Certainly it would be in a worthier cause than that of Sir Oswald Mosley!—I am, etc.,

Ilford, Essex.

ROGER M. NOORDIN.

SIR,—Sir Farquhar Buzzard must not be allowed to get away with that pontifical letter unchallenged. The *B.M.J.* is not a professorial chair. "The 'patient' in this case is a private citizen with a private citizen's rights, including that of entertaining his own political faith." What, even if it is the faith of the Germans; even if it delights in their bestial means—rubber bludgeonings, calculated brutality, inducement by fear; even if it seeks to stir up racial hates? Nonsense. The next sentence: "This country is at war with nations who contest that right and who do all in their power to suppress it, and it is largely to maintain what we believe to be an individual freedom of faith that we are fighting." Are we fighting to allow people to adopt the cruel and obtruding doctrine of Fascism? Nonsense, again. The herd was quite right in being sensitive to the release of the head of an organization whose associates are costing us an ocean of sweat, blood, and tears. The herd was obeying a sound instinct and arrived at sounder conclusions than those to which a restricted and juridical view—the typical professorial psychology—has brought Sir Farquhar. Can anyone doubt what part the "patient" would be playing if England were as Norway is? Sir Farquhar does not mention the wealth of the "patient," which had something to do with rousing the herd's suspicions. About the illness itself I am mystified. Is His Majesty's Prison Service unable adequately to look after a case of thrombosis? As for Sir Farquhar's suggested report—"In our opinion the health and perhaps the life of Sir Oswald Mosley will be endangered by his further detention"—that might truthfully refer to a cold or a corn.—I am, etc.,

Beckley, Sussex.

C. G. LEAROYD.

SIR,—In your issue of Jan. 29 I observed a letter from Sir Farquhar Buzzard. It is surprising, this criticism by so eminent a member of the profession. He refers to that section of the public who protested against the release of Mosley as "illogical, indefensible," and he further refers to the "hysterical Press and ignorant and foolish questions in the House of Commons"—a rather sweeping condemnation of these great institutions. This attitude throws a doubt on his own logic. No one would question the right to medical advice in a case of this kind, but this arrogant renegade, owing to his wealth, is able to obtain the services of very eminent members of the profession to press his claims for release. Public opinion—could also refer to the non-vocal section—was very much on the side of the "hysterical Press and ignorant House of Commons," and this reviving of an unpleasant episode would have been better left alone.—I am, etc.,

Southborne-on-Sea.

E. A. CHARTRES.

SIR,—Sir Farquhar Buzzard agrees that owing to the war "it became necessary to prevent the patient [Sir Oswald Mosley] from actively spreading his gospel." It is precisely anxiety on this point that led large and responsible sections of the public to protest against the release, at a critical phase of the war, of Britain's former Fascist leader and his wife. They were anxious lest this action would encourage and even facilitate the spread of propaganda detrimental to unity within the nation and between us and our Allies, and lest it would weaken the national effort and the morale of the troops. Their protests certainly did not reflect, as Sir Farquhar suggests, the desire for Mosley's personal suffering or even his death. It should be recalled that those who protested included the principal trade unions, deeply involved in the war effort. Yet they are dubbed by Sir Farquhar as confused, actuated by "herd psychology," acting illogically and indefensibly, and as displaying lamentable ignorance; while the Press is accused

of publishing uninformed and hysterical criticism, and M.P.s of asking ignorant and foolish questions. Such a diatribe against the British public for democratically expressing their opinion in the ways open to them on a matter which they believed affected their country's security seems inconsistent with Sir Farquhar's plea for tolerance of individual freedom of faith. Indeed, he has misunderstood the spontaneous and widespread hostile reaction to Mosley's release. It is, surely, a healthy sign that ordinary men and women are so much awake to the dangers of the doctrine which led to Mosley's detention, for it is the very embodiment of this doctrine of Fascism which we are aiming to destroy utterly abroad.—I am, etc.,

London, N.W.1.

P. D'ARCY HART.

### Plastics in Splint-making

SIR,—I read with interest Mr. James P. Campbell's note in the *Journal* of Jan. 29, and should like to comment on some of his statements.

Mr. Campbell says the manufacture of such a splint is in an experimental stage, presumably because he has only recently started to use them. I have made splints and other appliances in "perspex" for at least six years, and discovering very few surgeons who knew about the possibilities of this material I wrote a short introductory article on the plastic splint (*Lancet*, June 26, 1943, p. 803). These splints have been satisfactory for many purposes, and I can assure Mr. Campbell that not only is "perspex" non-irritant to the skin but is tolerated by any tissue. We all know "nylon" and "portex," used in sutures and dentures respectively; "perspex" has the same property of lying inert in the tissues, permitting its use as bone plates and in arthroplasties.

Mr. Campbell has also underestimated the strength of "perspex" in using 3/16-in. sheet! He will find 1/16-in. sheet adequate, with the great advantage that it can be cut with ordinary scissors after preliminary local heating over a small flame. His splint for a wrist will then weigh 3 oz. instead of 9 oz., and be infinitely easier to shape into greater accuracy. Another point which might be mentioned is the property of non-absorption. This is a valuable quality in some circumstances, but where the splint is complete and not just a slab, condensation of moisture is troublesome. The splint will then require holes drilled at intervals or a lining of thin felt.

Lately many people have written to me saying they have had difficulty in moulding splints where there are double curvatures. I hope there will soon be on the market suitable splints preformed as regards the main curves, and requiring only local moulding and fitting, thus ensuring a well-fitting splint of even thickness. Another aid to such work is a softener, which allows the treated "perspex" to be moulded in a plastic state, hardening twelve hours later; no heat is required. Leather retaining straps rather detract from the unique appearance of these splints, and I suggest that they should be replaced by transparent flexible plastic strips. Mr. Campbell says cracks cannot be repaired by heat. He will find that any cracked pieces can be "welded" by allowing glacial acetic acid to run in by capillary attraction. The acid dissolves the "perspex," allowing the edges to join together.—I am, etc.,

A. MACGOWAN.

### Photomicrography with Ordinary Cameras

SIR,—I am glad that Dr. Silcock (Jan. 29, p. 164) has added his testimony to the value of the method of photomicrography I described, and I must also congratulate him on being apparently the first to publish any account of the method, for during an avid reading of photographic and microscopical literature during thirty years I have never seen it described, and the textbooks know nothing of it. I may perhaps say that an earlier paper of mine describing the method specially for Leica users would have appeared in *Leica News*, but the war prevented publication, and a similar fate befell a more general account in 1942. Now that attention has been drawn to the method I trust that it will be widely adopted. Its value in industry is obvious.

It is important to realize that the method is applicable to all types of optical apparatus, and that for photomicrography at least it is not just a makeshift but scientifically the most correct way of taking a photograph. If the camera used had

a 10-in. lens it would give photographs identical with that seen by the human eye, and at least as good as those taken by the most elaborate photomicrographical apparatus. It would indeed make the latter as obsolete as the huge contraptions with which the pioneers of ordinary photography did their excellent work.

It is also necessary to emphasize that the simple method described by Dr. Silcock will not give good results unless the viewing eye is emmetropic. If this is not so, either a camera with focusing screen must be used or, much simpler, a gadget like I described if the correct focus is to be obtained. Actually this is not so critical as one might anticipate, as the microscope never works at a greater aperture than F. 22, and probably for this reason I find that photomicrographs taken with a 2-in. lens show appreciably greater depth of focus than my eye has.—I am, etc.,

Winstford,

W. N. LEAK.

## Obituary

JOHN S. FAIRBAIRN, F.R.C.P., F.R.C.S., F.R.C.O.G.

Dr. John S. Fairbairn, who died on Jan. 22, lived his professional life in London but never lost touch with Scotland, and went to live there when he retired from practice eight years ago.

John Shields Fairbairn was born on Dec. 21, 1865, at Bathgate, West Lothian, the elder son of Andrew Martin Fairbairn, D.D., first Principal of Mansfield College, Oxford. From Bradford Grammar School he entered Magdalen College, Oxford, with an open science demyship, and in 1891 gained first-class honours in the School of Natural Science; he went to St. Thomas's Hospital for his clinical course, and graduated B.M., B.Ch. in 1897, after taking the English Conjoint Diplomas. He obtained the F.R.C.S.Eng. in 1900, and in 1909 was elected F.R.C.P.Lond. Dedicating himself early to the practice of gynaecology and obstetrics Fairbairn became in turn pathologist to the Chelsea Hospital for Women, physician to the General Lying-in Hospital, York Road, and obstetric physician and lecturer in midwifery and diseases of women at St. Thomas's. At the Royal College of Physicians he served as examiner for four years, councillor for two years, and Bradshaw Lecturer in 1934, when his subject was the medical and psychological aspects of gynaecology; he also examined for the Universities of Oxford, Cambridge, Glasgow, London, Birmingham, and Leeds, and for the Society of Apothecaries of London. During the last war he served on the *à la suite* staff of the 5th London General Hospital with the rank of captain, R.A.M.C.(T.). He was one of the Foundation Fellows of the Royal College of Obstetricians and Gynaecologists in 1929 (and afterwards held office as President), and in the same year was elected Honorary Master of Midwifery by the Society of Apothecaries; the Obstetrical Society of Edinburgh made him an Honorary Fellow.

Fairbairn joined the B.M.A. in 1903, was secretary of the Section of Obstetrics and Gynaecology in the following year, and twice held office as president of that Section—in 1924 at Bradford and in 1935 at Melbourne, whose university gave him the honorary degree of M.D. on that occasion. He had been a frequent contributor to this and other medical journals; he edited for some time the *Journal of Obstetrics and Gynaecology of the British Empire*, and was the author of *Gynaecology with Obstetrics* and of a *Textbook for Midwives*; he was also editor of the *Practitioner's Encyclopaedia of Midwifery and Diseases of Women*. He preceded Sir Comyns Berkeley as chairman of the Central Midwives Board for England and Wales. In March, 1936, just before they left London, Dr. and Mrs. Fairbairn were entertained to dinner in the Langham Hotel, and over 100 guests were present under the chairmanship of Sir Ewen Maclean, who eulogized Fairbairn's work in furtherance of the teaching and practice of midwifery throughout Britain. At Lossiemouth, where he had spent many summer holidays, he was able in retirement to indulge his hobbies of golf and gardening.

We are indebted to Dr. J. P. HEDLEY for the following appreciation:

The death of John Fairbairn at Lossiemouth came as a great shock to his many friends, and perhaps especially so because few of us had been able to see him on account of the war

during the last four years. In peacetime he came to London for several weeks each year to see his friends and enjoy moving about in the old surroundings in which he was always so happy.

He came up to St. Thomas's in 1893 from Oxford, where he had taken a first class in the honours school of Natural Science; after qualifying at Oxford he was house-physician and obstetric house-physician before becoming obstetric tutor and registrar in 1898. Four years later he was appointed to the staff of St. Thomas's as assistant obstetric physician. His father, the Rev. Dr. A. M. Fairbairn, the first Principal of Mansfield College, Oxford, was a distinguished scholar, and it may have been from him that he inherited his devotion to education. Fairbairn was an enthusiastic teacher at the time when I first met him as obstetric tutor; later as a clinical teacher he was quite exceptional. For years generations of St. Thomas's men looked upon him as a great teacher, and very many have reason to be grateful for what he taught them. Fairbairn had original ideas in the organization of a complete obstetric service, and did more than anybody to plan and put into force the modern methods of education needed for such a service. He always made a great point of the indivisibility of obstetrics and gynaecology and accentuated this point in the title of his well-known book *Gynaecology with Obstetrics*. He taught that obstetrics was one of the most important parts of preventive medicine, and in his book he says, "At no stage in his hospital career can the student obtain a clearer object-lesson in the practice of preventive medicine than while studying obstetrics, gynaecology, and paediatrics: together they form a concrete example of the direct application of the teaching, otherwise wholly academic, in hygiene and public health." He always stressed the greater importance of training than of examinations.

At the Society of Apothecaries he was largely responsible for the institution of the Mastership of Midwifery, the first higher diploma in obstetrics in the country, in which all candidates had to have postgraduate experience in obstetrics, paediatrics, and public health, including a resident house appointment in an obstetric unit. Later, when the College of Obstetricians and Gynaecologists was founded—of which Fairbairn was the second President—similar training regulations were made. He was a very active member of the Central Midwives Board, both before and after becoming its chairman. He was just as keen on the education and training of midwives as of doctors. In connexion with the General Lying-in Hospital he conceived and brought into being the Camberwell Post-Certificate School, to which midwives came for refresher courses; this proved a great success, and has been the model for other schools spread over the country.

Although Fairbairn's greatest work was educational, there was no member of the St. Thomas's staff who was more conscientious and thorough in all his hospital duties and the care of his patients. His interest in hospital affairs was not confined to his own department: he was always ready to work for any new development he thought to be good. The loss of him to medicine is great, but fortunately he has left much in his writings that will be a guide and help to many in the future.

A. STEWART WILSON, F.R.C.S.Ed.

We have received news of the death on Nov. 2 at his home in Durban of Dr. A. Stewart Wilson. He had been ill for the last two years.

Alex. Stewart Wilson qualified M.B., Ch.B. at Glasgow in 1911, and took the F.R.C.S.Ed. in 1918. When the Royal College of Obstetricians and Gynaecologists was formed in England he was one of the very few South African doctors whom the College elected to foundation fellowships. After holding resident appointments in the Western Infirmary, Glasgow, he went to South Africa in 1913 and joined the staff of Addington Hospital, with which he was associated throughout his life as resident medical officer, senior visiting gynaecologist, and chairman of the medical staff committee. During the last war he served in France and at the South African Military Hospital, Richmond. Returning to South Africa after the war, Stewart Wilson began practice as a consultant gynaecologist in Durban, and rapidly became the leading member of his specialty in Natal. He was a member of the South African Medical Association (B.M.A.), and was president of the Natal



Coastal Branch and chairman of the Gynaecological Section at one of the annual meetings. He took a keen interest in the Berea Nursing Home, having been chairman of its board of directors and been largely responsible for its expansion and development. He was a brilliant operator, an original thinker, and a man of sound judgment. At the hospital there was keen competition to act as his resident, and many young doctors have expressed appreciation of his skilful teaching and kindly encouragement.

Among his varied interests outside his work were several branches of sport—he was a liberal patron of many of the sporting societies of the town—the British Empire Service League, a number of charitable institutions to which he contributed generously throughout his life, and the welfare of nurses—the training school for midwives was started through his efforts. A loyal and trusted friend, he will be sadly missed by his patients and by friends inside and outside the profession. He is survived by his wife and daughter, by whom he was devotedly nursed during his long illness.

#### THE LATE DR. G. C. ANDERSON

Viscount Dawson of Penn as President of the British Medical Association has received from Sir Alfred Webb-Johnson, President of the Royal College of Surgeons of England, a copy of the following resolution, unanimously adopted by the Council of the College at its last quarterly meeting: "The President and Council of the Royal College of Surgeons of England hereby express their deep regret at the death of Dr. George Cranston Anderson and their sympathy with the British Medical Association in the loss of their Secretary. The Council desire to place on record their admiration for Dr. Anderson's able services to the profession, particularly in regard to recruitment for the Services, and their appreciation of his success in bringing about a closer friendship between the College and the British Medical Association."

A copy has been received from the Royal College of Obstetricians and Gynaecologists of the following resolution passed at its last quarterly meeting: "That the profound sympathy of the President and Council be tendered to the British Medical Association in the great loss sustained by the death of Dr. G. C. Anderson."

Further messages of sympathy on the occasion of the death of Dr. Anderson have been received from the New Zealand Branch (by cable), from the National Temperance League, and from the Surgical Instrument Manufacturers' Association.

The death on active service of Fl. Lieut. C. F. H. WIESSNER was briefly announced in our issue of Jan. 1 (p. 28). Charles Frank Horace Wiessner was born in 1912. He studied medicine at Cambridge and the Middlesex Hospital, qualifying M.R.C.S., L.R.C.P. in 1938, and M.B., B.Ch. in 1940. He was for a short period in general practice in South-East London until appointed to a commission in the Medical Branch of the Royal Air Force Volunteer Reserve on March 21, 1941. At the date of his death he was medical officer at an Air Training school over-seas.

The death has occurred at Grimston, Norfolk, of CHARLES STUART WOODWARK, J.P., aged 66, fourth son of late George Woodward, a prominent citizen of King's Lynn out the turn of last century. Dr. Woodward was a younger brother of the late Lieut.-Col. G. G. Woodward, M.P., and of Sir Stanley Woodward. He was educated at St. Bartholomew's Hospital, whence he qualified in 1902. Some years ago a breakdown in health necessitated his retirement from practice, and lately an even more serious malady developed and caused his death. He was in general practice at Grimston for the whole of his active career, and his high reputation in the neighbourhood was shown by the addition of his name to the Commission of the Peace. A member of the B.M.A., he was chairman of the West Norfolk Division in 1922. He married Miss Winifred Hill, who survives him with their three sons and two daughters, all of whom are in the Services; one son is a squadron leader in the R.A.F., and another is a prisoner of war.

We regret to record the death on Jan. 14 at King's Langley of Dr. ELIZABETH THACKRAY. After qualifying M.B., B.S. in 1903 from the London School of Medicine for Women and the Royal Free Hospital, Dr. Hill (as she then was) held the post of house-surgeon to Sir James Berry at the Royal Free Hospital. She was next appointed assistant medical officer to St. Pancras Infirmary, resigning that position on her marriage to

Dr. Christopher Thackray, the medical superintendent. She resumed medical work during the last war, returning for part of the time to her post at the Infirmary, while later she was a medical examiner of recruits for the W.A.A.C. She retired finally from practice in 1918. Dr. Thackray had great personal charm, which endeared her to all her colleagues.

Dr. FRANCIS WILLIAM JOLLYE died suddenly on Jan. 14 at Alresford, Hants, aged 80. He was a native of Spalding, Lincs and left Cranbrook School in Kent to study medicine at King's College Hospital, winning the Warnford entrance scholarship in 1882 and other scholarships in successive years. He qualified M.R.C.S. and L.S.A. in 1885, took the D.P.H. in 1890, the F.R.C.S.Ed. in 1897, and the M.D. of Durham University in 1903. Settling in practice at Alresford he became M.O.H. under the rural district council, and held other local appointments. Dr. Jollye was a Fellow of the Society of Medical Officers of Health, joined the British Medical Association in 1891, and was president of the Southern Branch in 1913. A number of papers by him on clinical subjects appeared in these columns during the 'nineties. He retired from practice in 1937.

Dr. PURNELL PURNELL, whose death took place on Jan. 22 at Streatham, was the son of J. J. Purnell, F.R.C.S., and was educated at Epsom College and at Guy's Hospital. He qualified M.R.C.S., L.R.C.P. in 1889, and practised for very many years at Streatham. His chief claim to the grateful recollection of his professional colleagues lies in his unwearied efforts on behalf of the Royal Medical Foundation of Epsom College, in recognition of which he was some years ago elected a vice-president. He collected for the Foundation in all not far short of £3,000, a total which has been but once, or possibly twice, exceeded by any individual member of the profession. He married Miss Ivy Florence Goldsmid.

The death occurred at his daughter's house at Gwelo, S. Rhodesia, of THOMAS OVENS SCOTT at the age of 81 years. The eldest son of the head master of the Academy of Berwick-on-Tweed, he took the M.A. of Edinburgh in 1882, and entered the Presbyterian Church. While holding a pastorate at Newcastle-upon-Tyne he studied medicine, and graduated M.B., B.S. at Durham in 1897. After seven years, during which time he was appointed honorary surgeon to the Throat and Ear Hospital, Newcastle-upon-Tyne, he moved to Leeds, where he remained in general practice till 1934. Quiet and unassuming, and unselfish in his true Christian humility and sympathy, yet staunch and unchanging in his faith, Dr. Scott was a tower of strength in time of need. To all his many friends he has left memories, and all of them pleasant—a rich legacy. At the end of a vigorous healthy life he died peacefully in his sleep—a man without envy and without enemies. He leaves a daughter and three sons, two of whom are doctors—one at Sunbury-on-Thames and one in Leeds.

Mr. W. McAdam Eccles writes: May I emphasize two points in memory of the late Dr. C. E. DOUGLAS. One his great keenness on all matters concerning the B.M.A., shown especially during the World Tour of 1935. Dressed as the "Oldest Inhabitant" on the occasion of a fancy dress parade, he was awarded the first prize, but did not show signs of "old age". To signalize permanently the chess-playing during the trip he presented the "Melbourne Chess Cup" to the B.M.A., to be competed for annually and presented at the meeting of the Representative Body to the winner, to be held for twelve months.

The ashes of the late Mr. CECIL ROWNTREE, F.R.C.S., were scattered on Jan. 27 at a brief ceremony, the first of its kind in the history of the hospital, on the spacious lawn in front of the Woolwich Memorial Hospital, Shooters Hill. Those present were Mr. Tom Rowntree, F.R.C.S. (son), Air Commodore E. G. Dixon (chairman of the hospital), Mr. E. T. C. Milligan, F.R.C.S. (chairman of the medical committee), Mr. A. W. Lincoln Bell, F.R.C.S. (resident surgical registrar), and Miss C. E. Lotherington (matron). The chairman of the hospital, in paying tribute to Mr. Rowntree, referred to the affection and respect in which he was held. He had helped to design the hospital and was its first surgeon. He placed his exceptional surgical skill and advice ungrudgingly at the disposal of the public of Woolwich, the board of management, and the medical and nursing staffs. He would ever be remembered as an inspiration to the staff and with gratitude by those who benefited by his surgery. To his wife and family he offered, on behalf of the hospital, deepest sympathy. Mr. Milligan, who performed the ceremony, said that Mr. Rowntree was essentially a happy man, animated by an ardent desire for hospital efficiency through unity between surgeon and surgeon, and between the medical committee and the board of management. In this he showed himself to be a true statesman, for he saw that such unity based on good will was the secret of sound homes, team-work in industry, and a united nation.

## Universities and Colleges

### UNIVERSITY OF CAMBRIDGE

At a Congregation held on Feb. 21 the following degrees were conferred:

M.B., B.CHIR.—D. Ainslie, F. Ashton, V. L. Ballington, A. Carpenter, P. Cook, F. H. Epstein, W. G. Evans, A. H. M. Fisher, W. M. Foreman, A. Hallinan, R. F. Hobson, R. G. F. Parker, T. J. Rendle-Short, L. A. Cook, L. J. Rowley, I. A. Roxburgh, F. A. R. St. John, D. H. K. Soltau, G. Somerville, R. G. Tasker.

1 In person.

### UNIVERSITY OF LONDON

#### WESTMINSTER HOSPITAL MEDICAL SCHOOL

An examination for two entrance scholarships in anatomy and physiology will be held on March 15 and 16. For further particulars application should be made not later than Feb. 21 to the Secretary, Westminster Hospital Medical School, 17, Horseferry Road, S.W.1.

### ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly Comitia of the College held on Jan. 27, with the President, Lord Moran, in the chair, the following were elected Representatives of the College: Dr. B. T. Parsons-Smith on the Council of the Queen's Institute of District Nursing; Dr. A. S. James on the Court of Governors of the University of Birmingham. It was announced that the President was nominating a committee to preside over the work of revision of the College's publication *The Nomenclature of Diseases*. It was also announced that arrangements have been made for examinations for the Membership of the College to be held in Poona and in Cairo during May and June, 1944.

The following candidates, having satisfied the Censors' Board, were elected Members of the College:

C. R. Amies, M.D.Lond., J. Benn, M.B.Leds, Surg. Lieut.-Cmdr. R. N. Mary E. Elliott, M.B.Lond., J. A. Fisher, M.D.Belfast, J. H. Gould, M.B.Lond., E. Gutzmann, M.D.Munich, D. B. Jeffile, M.B.Lond., T. D. Kellack, M.B.Camb., Zena E. Moncrieff, M.B.Aberd., R. T. C. Pratt, M.B.Oxon, C. Preisch, B.M.Lond., J. A. Corfield, J. C. Gorton, G. S. Crockett, J. S. N.V.R., H. W. Salmon, M.B.Lond., H. T. N. Sears, M.B.Lond., Sharkey, M.B.Lond., A. I. Spriggs, B.M.Oxon., A. W. Taylor, M.B.Leds, J. P. M. Tizard, B.M.Oxon., Capt. R.A.M.C. M. D. Young, M.B.Lond.

Licences to practise were granted to the following 133 candidates (including 23 women) who had passed the Final Examinations in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

J. Alterman, C. van C. Anthony, C. G. Ball, G. H. Bancroft-Livingston, R. E. Barnes, J. H. E. Bergin, V. H. Bolton, J. A. P. Bowen, T. J. Brady, Elizabeth T. Brash, L. D. Bromley, H. D. Browne, J. Bullough, K. H. Bywater, A. S. Carnahan, J. A. Clarke, J. R. Clout, H. T. Coles, J. R. C. Cooper, Margaret J. Corbridge, J. A. Corfield, J. C. Gorton, G. S. Crockett, J. S. N.V.R., G. A. N. Davis, Deborah Doniach, Kathleen A. D. Drury, D. R. Duff, Margaret J. Dunn, R. Earl, P. M. Edis, A. W. Edridge, Olga M. Elliot, A. B. A. Evans, M. E. Evans, J. M. Fabricius, Winifred J. Ferraby, V. H. Finlayson, J. R. Forsyth, I. H. Fothergill, S. A. M. Garbhan, B. Haigh, L. H. Hamlyn, R. J. Harrison, G. Handridge, Ruth M. Haslam, V. S. Hawkes, S. F. Hewson, H. F. Hitt, Duke E. Holden, F. L. Holroyd, J. E. G. Hope Scott, R. Humphrey, R. W. L. Hurr, Lois E. Hurter, J. R. Hutchinson, E. Jackson, Rosemary Jackson, C. D. T. James, L. F. Jepson, G. Jones, Jean L. Kahn, D. E. R. Kelsey, J. C. Lawrie, G. de J. Lee, Sheila D. Lee, A. V. Livingston, S. S. London, J. Lorber, P. Lucas, M. B. Mellroy, A. G. Mackenzie, I. M. MacLean, N. L. M. MacLennan, R. Majidani, A. S. Maitland, J. M. Mallet, J. T. Mastroianni, J. K. Morgan, Catherine A. Noll, D. C. J. B. Nixon, A. W. Nurick, A. C. F. Ogilvie, D. H. D. Paine, C. R. Palmer, T. J. S. Patterson, B. W. T. Pender, C. P. Perkins, Dorothy M. Phillips, Mary Pilling, W. E. Prosser, A. A. Quilliam, J. V. Radley, D. H. Rea, D. L. Rees, L. J. Rowley, Helen M. Russell, J. T. Seales, C. L. E. H. Sharp, Edith M. Sharpe, G. N. Shell, J. Shenfield, P. D. W. Shepherd, R. N. Sidebottom, B. C. Smith, Y. G. Sofer, G. Somerville, R. Spielmeier, R. V. Sturton, S. M. Talbot, A. Taylor, H. Taylor, C. G. Tolerson, J. M. Thomas, W. E. W. Tilleke, Margaret R. Todd, L. J. Totham, E. J. S. Townsend, E. L. Tricker, G. Trosser, E. C. Turton, Ambrosio B. Vaughan, B. H. Vawdrey, P. Venables, C. I. Waters, K. Whitmore, Dorothy Willoughby, Joan B. Winstanley, P. W. Woodcock.

Diplomas in (a) Public Health (2), (b) Psychological Medicine (8), and (c) Laryngology and Otology (5) were granted to the successful candidates whose names were printed in the report of the meeting of the Royal College of Surgeons of England in the *Journal* of Jan. 22 (p. 134). Diplomas in Anaesthetics (27) were granted to those whose names appear in the report of the meeting published in the *Journal* of Dec. 25, 1943 (p. 835).

### ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting held on Feb. 1, with the President, Dr. A.ergus Hewat, in the chair, Dr. Donald Stewart (Birmingham) and Dr. Alexander Brown (Edinburgh) were introduced and took their seat as Fellows of the College. Dr. Duncan Macmillan (Nottingham), Dr. Richard Edward Verney (Edinburgh), and Dr. Joshua James Morris Jacobs (London) were elected Fellows. Mr. Norman I. Dott, F.R.C.S.Ed., was appointed Morison Lecturer for 1944. Dr. A. Rae Gilchrist, F.R.C.P.Ed., was appointed George Alexander Gibbon Lecturer for 1944.

### ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a quarterly meeting of the Council held on Jan. 29, with the President, Mr. Eardley Holland, in the chair, the following candidates were elected to the Membership: A. P. Bentall, Jean R. Burton-Brown, Agnes E. Cathcan, Audrey I. Freeth, D. Friedlander, M. M. Garrey, Eileen D. M. Wilson.

The Council passed a resolution of sympathy with the British Medical Association on the death of their Secretary, Dr. G. C. Anderson. The President was appointed to serve *ex officio* as a member of the Committee of Management of the Royal Medical Benevolent Fund.

### CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examinations, have been granted the diploma of L.R.C.P.Ed., L.R.C.S.Ed., L.R.F.P.&S. Glas.:

J. M. Allan, S. Batkin, H. D. Bauer, L. Beukes, H. Bynst, F. G. Brindley, H. S. Dougal, N. R. Eaton, A. S. W. Eccerton, Jeanette R. B. Gibson, J. A. Love, C. K. Mackinnon, D. S. Mathers, W. Y. Muir, D. R. O'Keefe, J. A. Orr, P. C. C. Petters, G. L. Plester, S. M. O. Price, A. R. Ray, S. L. Schwarzwald, J. D. Scobie, J. S. M. Sililo, A. S. Smith, M. Spence, J. S. Stevenson, J. A. Sykes, Ruth R. Turner, S. Walport, J. Wilson, W. H. A. Windress, J. A. Wright.

I. Lopertas, M. Rottenberg, and E. Stengel, graduates of recognized foreign universities, were also admitted licentiates.

## Medical Notes in Parliament

### Relief in Europe: Medical Problems

The House of Commons on Jan. 25 discussed the proposals for relief and rehabilitation of the areas in Europe as they are freed from enemy control. The debate arose on a vote of credit which included expenses for relief and rehabilitation, and Sir JOHN ANDERSON explained that the Government proposed that Great Britain should contribute 1% of the national income, which would amount in round figures to £80,000,000. Mr. GREENWOOD, speaking of the enormous problems which lay ahead, said that starvation was rampant over the greater part of occupied Europe to-day, and the situation would grow worse. Increasing debility, lowered resistance to disease, epidemics of typhus, and a growing amount of tuberculosis would become more dangerous because of the large-scale forced migration which had taken place. About 20,000,000 people had been driven from their homes and countries, and a great many of them had become disease carriers. It was important to know the organization of the personnel of U.N.R.R.A. Were the doctors ready? Were there specialists for the restoration of the sanitary services?

Dr. HADEN GUEST said that although the food situation in the Middle East and North Africa had much improved, that in Italy was different and more serious, and showed the difficulties with which we should be faced. There were great food difficulties although we were in control of the area, and a raging typhus epidemic, which was difficult to control but which, fortunately, had not spread to the Allied Forces. The situation in Italy was precisely the kind which would arise in other parts of Europe, and he urged that a White Paper, dealing with the experience of relief up to date, should be published. He hoped that the voluntary relief organizations would be given, under proper supervision and after proper selection, a rather freer hand than the present Command Paper suggested. Another matter of very great importance concerned medical staffs for this work. He did not know where medical staff was to be obtained. At present we could not recruit a very large number of people from this country for medical relief work on the Continent because they were not available, but a very large number would be required for the war in the Far East. There would always be some shortage of doctors from this country, but as soon as we had got into occupied Europe many doctors belonging to the countries there would be available to give us very considerable help, and no doubt they would be willing to co-operate. He did not think the doctor difficulty would be insuperable, and he believed we should be able to control epidemics, but he hoped that what was going on in Italy would lead to a little better organization than apparently existed.

Mr. LAW said that it was impossible to estimate what the demand for voluntary workers from this country would be. At the moment the Council of British Societies for Relief Abroad was making up teams to be held in reserve against any demand from U.N.R.R.A. Those teams would, he hoped, be highly qualified. For example, there was a water purifica-

tion unit, a bacteriological unit, a static disinfector unit, and so on. It was not going to be a sort of Continental holiday for young people from Mayfair. Extremely skilled and highly qualified people would be wanted to go out and assist in the relief work in Europe.

### Army Doctors' Administrative Duties

On Jan. 25 Major CHARLES TAYLOR asked the Secretary of State for War how many members of the medical profession are employed in administrative posts in the Army or on other duties which did not involve the use of their medical skill; and, in view of the shortage of doctors, both in the Services and among the civil population, whether he would arrange for administrative posts in the R.A.M.C. to be filled by men who were not doctors. Sir JAMES GRIGG: If the question is taken literally, the answer is "None, sir"; but in view of the general shortage of doctors, a detailed investigation has been made of Army medical establishments at home and abroad. Wherever possible, officers without medical qualifications have replaced qualified medical officers employed on administrative duties, even in those posts where professional medical knowledge, although not essential, is very useful.

Major TAYLOR asked if there were not a number of cases of doctors who very rarely, if at all, used their medical skill, and who were doing purely administrative jobs in the R.A.M.C. Sir JAMES GRIGG said if Major Taylor meant purely routine administrative jobs, he imagined that the medical directors in command or in theatres of war abroad would have to be doctors, because their medical knowledge was essential for the proper administration of the medical service.

### Catarrhal Jaundice

Mr. SORESEN asked on Jan. 27 whether the Minister of Health could state the extent of the outbreak of catarrhal jaundice and to what cause or causes it was attributed. Mr. WILLINK said catarrhal jaundice was not a generally notifiable disease, although for research purposes it was recently made notifiable in certain eastern counties. He had, therefore, no definite information about its incidence. It had latterly become prevalent throughout Europe and in North Africa as well as in this country. Its causes had not been established. The Medical Research Council was making a special investigation of the disease. There was nothing to show any connexion between catarrhal jaundice and public baths.

### British Prisoners in Japanese Hands

In a statement to the House of Commons on Jan. 28 on *Japanese treatment of British prisoners*, Mr. EDEN said that in Siam many thousands of prisoners from the British Commonwealth, including India, were compelled by the Japanese military to live in tropical jungle conditions without adequate shelter, clothing, food, or medical attention. These men were forced to work on building a railway and making roads. Their health was rapidly deteriorating; a high percentage were seriously ill, and there had been some thousands of deaths. The number of such deaths reported by the Japanese was just over 100. The railway and roads concerned lead into Burma, and the conditions described applied throughout their length. One eye-witness reported of a camp in Siam: "I saw many prisoners clearly. They were skin and bone, unshaven, and with long matted hair. They were half-naked." The same witness reported that they wore no hats or shoes; and this in a tropical climate where there were practically no local resources which could provide medical or other material relief.

From Java came evidence which left no doubt that many of our prisoners were confined in camps with no adequate protection from malarial infection and lacking in proper provision for sanitation. Food and clothing provided was insufficient to maintain them in health. Reports from the northern area referred to the emaciated state of prisoners arriving from Java. In Hong Kong, Formosa, Shanghai, Korea, and Japan itself conditions generally were tolerable, although the scale on which food was provided was not adequate over long periods to maintain the health of prisoners. Conditions in Hong Kong appeared to be growing worse. In the transport *Lisbon Maru*, used to convey 1,800 British prisoners of war from Hong Kong, the prisoners were seriously overcrowded. Many were undernourished. Many had contracted diphtheria, dysentery, and other diseases. There was no medical provision, and sanitary arrangements were virtually non-existent. The vessel was torpedoed. The Japanese kept the prisoners under hatches and abandoned ship. At least 800 prisoners lost their lives. The Japanese had violated the principles of international law. The replies of the Japanese Government to the protests of the British Government, through the Swiss Government, had been evasive, cynical, or otherwise unsatisfactory.

### The Scottish Infant Mortality Report

On Feb. 1 Mr. BUCHANAN asked the Secretary of State for Scotland if he had considered the report of the committee, presided over by Sir John Boyd Orr dealing with child mortality, and what action it was proposed to take. Mr. JOHNSTON: Yes, sir. On the day of publication I invited the association of local authorities and other interested bodies to consider the report with a view to discussions which I propose to open immediately. Preliminary estimates indicate that the infant mortality rate, while still unsatisfactory, is likely to be lower in 1945 than it has ever been in Scotland.

Mr. BUCHANAN asked if there was any reason for not discussing this report, and if the Minister consulted with only one or two authorities. Mr. JOHNSTON said it was not one or two authorities. He had invited associations of local authorities which covered them all, to consider the report. It was not being ignored. It was published as early as possible, and drew the attention of the associations of local authorities to it on the date of publication.

Later in the day Mr. BUCHANAN asked the leader of the House if it would be possible to have time to discuss the report. Mr. EDEN said he had gone into this matter and found that it would be discussed on the adjournment in about a fortnight. That would give only a brief opportunity, and he had consulted the Secretary for Scotland, who felt, like the Government, that this was a matter on which they should seek to give opportunity for full discussion. He could not say, there and then, how it would be contrived, but it was the Government's wish that the report should be discussed. Perhaps Mr. Buchanan would allow the Government to make the necessary arrangements in the ordinary way.

*Mass Radiography Unit for Liverpool.*—Replying on Jan. 27 to Mr. Kirby, Mr. WILLINK said he hoped to provide a mass radiography unit for Liverpool early in May. The proportion of persons examined by mass radiography who were found to require institutional treatment was very small. He was not aware that Liverpool Corporation foresaw difficulty in this connexion in the near future having regard to the measures now being taken to increase the city's present accommodation for tuberculosis cases.

*Light Diet of Dysentery Patients in Italy.*—On Feb. 1 Colonel GREENWELL asked the Secretary of State for War if he was aware that the provision of light diet at base hospitals in Italy was insufficient for patients suffering from gastric disorders or from dysentery, and if, to rectify this state of affairs, he would consider having the relatively small quantities of foodstuffs required supplied regularly by air. Sir JAMES GRIGG: I am glad to say that the incidence of dysentery and gastric disorders in this theatre of war has been very low in recent months. It has been difficult at times to maintain an adequate supply of fresh eggs, but I do not know that there has been any other difficulty in providing suitable light diets for patients in base hospitals.

## The Services

The *London Gazette* has announced the award of the M.C. to Lieut. (War Subs. Major) A. K. Dougall, Capt. D. W. Forga (since killed in action), P. McL. Gunn, and J. W. T. Prentice R.A.M.C., and Capt. H. W. Chestnut, R.C.A.M.C. (attached R.A.M.C.) in recognition of gallant and distinguished services in Italy.

Col. (Temp.) G. A. Walsley and Capt. L. MacD. Reid, R.A.M.C. have been mentioned in dispatches in recognition of gallant and distinguished services in North Africa, and Capt. H. C. Duncan I.M.S. (seconded I.A.M.C.), in recognition of gallant and distinguished services in Burma and on the Eastern Frontier of India.

The *London Gazette* has announced the appointment as M.B. (Military Division) of Capt. L. M. Kelly, I.M.S. (seconded I.A.M.C.) in recognition of gallant and distinguished services in Burma and the Eastern Frontier of India.

Acting Surg. Cmdr. D. R. Goodfellow has been awarded the R.N.V.R. Officers' Decoration.

### CASUALTIES IN THE MEDICAL SERVICES

*Wounded.*—War Subs. Capt. A. F. Crook, B. S. Lush, J. A. Naughton, and G. H. Pickering, R.A.M.C.

*Died of Wounds.*—War Subs. Capt. W. H. Lang, R.A.M.C.

*Killed.*—Capt. D. R. Harbison, War Subs. Capt. J. L. Shan R.A.M.C.

*Prisoners of War.*—War Subs. Capt. D. O. Davies, Acting Major G. H. Garlick, Temp. Lieut.-Col. W. G. Harvey, War Subs. Capt. E. Leigh, War Subs. Capt. B. Lennox, War Subs. Capt. J. D. Lod War Subs. Capt. B. Mayne, Capt. E. A. Smyth, Acting Major F. Webster, R.A.M.C.

*Died.*—War Subs. Capt. E. M. Gamble, R.A.M.C.

No 3

## INFECTIOUS DISEASES AND VITAL STATISTICS

Print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Jan. 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, for: (a) The 126 great towns in England and Wales (including London) (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	70	4	19	3	1	92	8	27	1	4
Deaths ..	—	—	1	—	—	2	—	—	—	—
Diphtheria	712	33	174	110	51	998	58	233	99	24
Deaths ..	10	—	6	—	—	19	—	6	4	1
Dysentery	148	41	69	1	1	113	11	25	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica	—	—	—	—	—	—	—	—	—	—
Deaths ..	1	—	—	—	—	2	—	1	—	—
Erysipelas	—	—	49	15	4	—	—	60	16	2
Deaths ..	—	—	—	—	—	—	—	—	—	—
Fetive enteritis or diarrhoea under 2 years	—	—	—	—	—	—	—	—	—	—
Deaths ..	46	7	8	10	7	37	—	8	18	2
Cases ..	661	118	138	212	1	11,527	759	375	6	38
Deaths ..	—	—	—	—	—	16	—	1	—	—
Phtharmia neonatorum	65	5	22	—	1	69	4	24	—	2
Deaths ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever	2	1	4	—	—	1	—	2	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* (from influenza)	1,122	141	30	21	3	1,404	86	22	5	6
Deaths ..	143	16	4	6	—	100	13	6	2	1
Pneumonia, primary	—	—	300	50	—	—	—	316	23	12
Deaths ..	—	85	—	19	17	—	—	—	—	—
Sub-encephalitis, acute	1	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Stomachitis, acute	5	—	—	1	—	3	—	3	8	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever	—	5	14	—	—	—	2	12	3	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Scarlet pyrexia†	181	11	16	—	5	187	16	19	—	3
Deaths ..	—	—	—	—	—	—	—	—	—	—
Slapsing fever	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever	2,110	157	186	31	99	2,203	158	361	38	57
Deaths ..	1	—	—	—	—	1	—	2	—	—
Salmonellosis	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Shigellosis	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Shigellosis	2	1	—	5	—	7	1	2	3	1
Deaths ..	—	—	—	—	—	—	—	—	—	—
Shigellosis	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Shigellosis	2,215	178	233	74	22	1,841	133	129	120	8
Deaths ..	15	—	1	2	—	12	1	2	6	—
Smallpox (0-1 year)	453	59	80	69	28	440	51	80	66	30
Infant mortality rate (per 1,000 live births)	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths)	5,841	935	698	258	167	5,832	1,046	730	250	150
Annual death rate (per 1,000 persons living)	—	—	16.0	16.8	±	—	—	16.5	18.4	±
Births	6,515	865	888	364	252	6,251	797	949	383	286
Annual rate per 1,000 persons living	—	—	18.1	23.8	±	—	—	19.4	25.2	±
Stillbirths	252	27	31	—	—	249	17	46	—	—
Rate per 1,000 total births (including stillbirths)	—	—	—	34	—	—	—	46	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

± Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales during the week the common infectious diseases of childhood rose in incidence: scarlet fever by 363 cases, whooping-cough by 192, measles by 102, and diphtheria by 39. There were 172 fewer cases of acute pneumonia, and 27 fewer of dysentery.

The deaths from influenza in the 126 great towns were 54 fewer than in the preceding week. The decline in Greater London, from 61 to 54, was less noticeable than elsewhere.

The rise in the incidence of scarlet fever was general, but was largest in Lancashire 51, and Yorks West Riding 62. Notifications of whooping-cough were, however, more localized; the largest increases were in Middlesex 55, Warwickshire 36, Yorks West Riding 32, and Essex 28. The rising trend of measles was mainly in the south, especially in Sussex with an increase of 55. The decline in the notifications of pneumonia was general throughout the country; the greatest decrease was in Lancashire 31, but in marked contrast to the general fall there was a rise of 36 in London.

The outbreaks of dysentery were concentrated in and around London. The largest centres of infection were London 41, Sussex 14, Surrey 12, Middlesex 11, and Lancashire 18.

Scotland reported a lower incidence for measles by 69, acute primary pneumonia by 57, scarlet fever by 43, and whooping-cough by 19, but dysentery notifications were up by 30 and diphtheria by 16. The increase in diphtheria was confined to the eastern and south-eastern areas. Two outbreaks of dysentery were reported during the week: Ayr County 12, and Dunbarton County 11. Dysentery in Edinburgh fell from 13 to 7 cases, but rose in Glasgow from 9 to 14.

In Eire measles notifications went up from 71 to 212: Dublin C.B. 94 cases, and Dublin North R.D. 100 (in an institution). Diphtheria (4 cases more) was notified from forty-two areas, and whooping-cough (22 cases more) from only six areas.

In Northern Ireland the incidence of diphtheria and scarlet fever remained high. The principal centres of infection were for scarlet fever, Belfast C.B. 64, and for diphtheria, Londonderry C.B. 17. There were 9 cases of diphtheria in a mental hospital in Omagh.

## Health Education

The *Pharmaceutical Journal* for Jan. 1 contains Ministry of Health Bulletin No. 1, the first of a quarterly series the aim of which is to use the men and women in Britain's 15,000 chemists' shops as "missionaries for health." The idea is to tell the pharmacists of the country the why and the wherefore of official health campaigns, in the hope that they will play a part in educating the public. The first bulletin, which has a foreword by Sir Wilson Jameson, contains an article by Col. L. W. Harrison on venereal disease and another on droplet infections by Dr. W. H. Bradley.

## Week Ending January 29

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,928, whooping-cough 2,104, diphtheria 777, measles 919, acute pneumonia 1,079, cerebrospinal fever 60, dysentery 176, paratyphoid 4, typhoid 2. In the great towns 104 deaths were attributed to influenza.

An appeal on behalf of the Princess Tsahai Memorial Hospital Fund has been signed, among others, by Sir Farquhar Buzzard, Lord Moran, P.R.C.P., Sir Alfred Webb-Johnson, P.R.C.S., Prof. Charles McNeil, P.R.C.P.Ed., Mr. J. W. Struthers, P.R.C.S.Ed., and Prof. John A. Ryle. During the years 1936-41 the Emperor of Ethiopia lived in this country: his daughter, Princess Tsahai, undertook training as a nurse at the Great Ormond Street Hospital for Sick Children, and after passing the examinations qualifying her to become a State-registered nurse she entered Guy's Hospital for further training. Her object was to fit herself to lead the movement for a modern medical and nursing service in Ethiopia, after its freedom had been restored. When this time came she returned to her country with the nucleus of the organization she intended to create, but her work was stopped by her illness and death at the age of 22, on Aug. 17, 1942. The present appeal is for funds to found in Ethiopia a hospital with medical school, library, and ambulance services in memory of the Princess Tsahai, and as a token of good will to Ethiopia from the people of Great Britain. It is hoped that those who are engaged in our own health and hospital services will help in this work, and that their gifts may be commemorated in some special part of the hospital. Donations may be sent to the hon. treasurer, Lord Horder, c/o Messrs. H. Reynolds and Co., 9, Greenhalgh Walk, London, N.2.

## Medical News

It is proposed to hold the Annual Congress of the Ophthalmological Society of the United Kingdom on Friday, March 31, and Saturday, April 1, at the Royal Society of Medicine, Wimpole Street, W. There will be two subjects for discussion: the first, at the Friday morning session, is "Ocular Psychoneuroses (excluding Miner's Nystagmus)," and will be opened by Mr. R. C. Davenport and Squad. Ldr. J. H. Daggart. The second, at the Saturday morning session, is "Virus Affections of the Eye," and will be opened by Prof. A. Sorsby and Dr. C. H. Andrewes. Part of the Friday afternoon session will be devoted to a joint clinical meeting with the Ophthalmological Section of the Royal Society of Medicine.

A paper on "The Art of Cooking Vegetables" will be given before the Royal Society of Arts, John Adam Street, Adelphi, W.C.2, by Miss Phyllis L. Garbutt, A.I.C., on Wednesday, Feb. 16, at 1.45 p.m.

The "Radio Doctor" will deal with "What is Immunization?" in his broadcast talks in the "What is it?" series in the B.B.C. Home Service at 7 p.m. on Sunday next, Feb. 13.

A Diagnosis Section meeting of the Faculty of Radiologists will be held at 32, Welbeck Street, W., on Saturday, Feb. 19, at 10 a.m., when there will be a discussion on lung abscess.

The following meetings of the British Institute of Radiology will take place at 2.30 p.m. in the Reid-Knox Hall, 32, Welbeck Street, London, W.: Friday, Feb. 18, meeting of medical members. Saturday, Feb. 19, ordinary meeting, at which Dr. Norman P. Henderson will read a paper on the value of the opaque cinema and its modifications.

A sessional meeting of the Royal Sanitary Institute is to be held at Bournemouth on Feb. 19, when the morning will be devoted to papers on "Health Education at Infant Welfare Centres and War-time Nurseries" by Dr. Vida Stark and on "Food Hygiene of Hotels and Restaurants" by Mr. W. Riley, senior sanitary inspector of Bournemouth. After lunch, which is at the invitation of the Mayor and Corporation, there will be a visit to Linford Sanatorium, near Ringwood. Further information may be had from the hon. local secretary, Dr. H. Gordon Smith, Town Hall, Bournemouth.

An extension of the Limb-fitting Centre at Queen Mary's (Roehampton) Hospital will be opened on Tuesday, Feb. 22, by His Excellency the Chinese Ambassador, Dr. Wellington Koo. After the Minister of Pensions has expressed thanks to the Governors for providing the extended building Dr. R. Langdale Kelham will show a film, with commentary, and there will be a demonstration by patients of the use of artificial limbs.

At a meeting of the Eugenics Society on Tuesday, Feb. 22, at 5.30 p.m., in the Rooms of the Royal Society, Burlington House, Piccadilly, Mr. B. S. Bramwell will give an address on "The Order of Merit: the Holders and their Kindred."

Twelve clinical demonstrations in neurology in connexion with the course of instruction for a diploma in psychological medicine will be given at Maida Vale Hospital for Nervous Diseases, London, W.9, at 3 p.m., on Feb. 29; March 9, 16, 23, and 30; April 4, 13, 20, and 27; and May 11, 18, and 25. The fee for the series is three guineas, paid in advance, cheques being made payable to the London County Council and forwarded to Dr. W. W. Kay, acting hon. director of the Maudsley Hospital Medical School, Central Pathological Laboratory, West Park Hospital, Epsom, Surrey, to whom inquiries regarding the course should be addressed.

The following meetings of the Royal Sanitary Institute will be held next month at 90, Buckingham Palace Road, S.W.1, at 2.30 p.m. On March 1 Mr. P. G. Shute will read a paper on "Indigenous Malaria and Mosquito Control in England after the War"; on March 15 Sir William Savage will open a discussion on "Current Questions of Milk Supply"; and on March 28 Mr. A. Longworth will speak on "Rational Design of House Plumbing."

The Association of Scientific Workers (Hanover House, 73, High Holborn, W.C.1) announces that Prof. P. M. S. Blackett, F.R.S., has been appointed its president from Feb. 1, 1944.

Mr. W. C. W. Nixon has been appointed Medical Representative to the British Council in Turkey.

The prices of all brands of unmodified and modified insulin are to be reduced on Feb. 14, when a new schedule of prices will come into operation.

A new Order prohibits nurses in mental hospitals and institutions in Scotland from leaving their employment without the consent of the employing authority. This brings practice in Scotland into line with that in England and Wales.

Dr. T. Chalmers Borthwick, late of Ichang, China, has been reported a prisoner of war in Japanese hands.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Post-partum Haemorrhage

**Q.**—*Post-partum haemorrhage seems to be much more frequent lately, even after easy labour. Several of my colleagues with whom I have discussed this matter are of the same opinion. (1) Is there any explanation? Could it be due to deficiency of diet? (2) Can any measures be suggested which might be adopted during pregnancy to lessen the risk of such an alarming event? (3) Intravenous ergometrine has been found an excellent remedy, but is no longer obtainable. Is it safe to give pitocin intravenously in urgent cases? What dose is advised?*

**A.**—Reference to the statistics of a maternity hospital dealing with over 3,000 "district" and "in-patient" deliveries per annum does not reveal any significant change in the incidence of post-partum haemorrhage during the last ten years. (1) If there is an increase dietetic deficiency is an unlikely cause. The degree of malnutrition would have to be gross. An increased use of anaesthetics should be borne in mind as a possible explanation. (2) Prophylactic measures recommended are: calcium lactate 30 to 40 gr. daily during the later months of pregnancy; quinine hydrochloride 1 gr. t.d.s. during the last 2 to 3 weeks of pregnancy; pitocin 0.25 c.cm. intramuscularly; or stilboestrol 0.5 mg. by mouth twice daily for 1 to 2 weeks before delivery. (3) Pitocin may safely be given intravenously in a dose of 0.1 to 0.2 c.cm. (1 to 2 units). In emergency, as much as 5 units has been given without ill effect, but so large a dose involves the risk of reaction, because pitocin is not entirely free from vasopressor factor.

#### Effect of Cervicectomy on Pregnancy

**Q.**—*A patient aged 35 already has two children aged 9 and 7. After the birth of the second child she had the following operation—amputation of cervix and anterior colporrhaphy for cystocele. No further pregnancies were considered owing to poor general health. She is now much improved and anxious to have another child. Is it correct that the chances of pregnancy are much less after such an operation, and that, should she become pregnant, early interruption—abortion or premature labour—is likely? Is recurrence of cystocele probable?*

**A.**—Conception is not impaired by a previous plastic repair if this has been wisely and skilfully performed. If a high amputation of cervix has left the patient with practically no vaginal cervix there is an increased risk of early abortion. This risk could be minimized by taking special care during the week of the suppressed period for the first 3 to 4 months: excessive weariness, travelling, strong purges, and intercourse should be avoided. The injection of 5 mg. of progesterone would also be helpful once or twice during this week. If in the second stage of labour an episiotomy is performed, a great deal of the tension on the previous repair is relieved and the chance of recurrence is correspondingly reduced. To summarize: if a prolapse has been effectively repaired there is no reason why a subsequent pregnancy should not occur and be satisfactory.

#### Fröhlich's Syndrome

**Q.**—*What is the best line of treatment for a girl of 11½ years suffering from Fröhlich's syndrome?*

**A.**—The triad of Fröhlich's syndrome is adiposity, failure of sexual development (primary and secondary sexual characteristics), and dwarfism. The diagnosis, however, can be correctly made if only the first two features are present. Very often, however, the diagnosis is incorrectly made when adiposity is the only feature and sexual development is normal, slightly delayed, or (especially in the case of the boy) obscured by adiposity. It is difficult to diagnose Fröhlich's syndrome in a girl of 11½ years, since puberty may not occur in normal individuals until a later age than this. Where sexual development is lacking, it may be stimulated by gonadotropic hormone.



the male, pregnancy urine extract is effective. In the female, this would be combined with the follicle-stimulating hormone of pregnant mare's serum, or with the follicle-stimulating hormone of bovine pituitary glands. The adiposity is treated on the usual lines, with diet and thyroid. Should dwarfism be a feature, pituitary growth hormone is advisable if the epiphyses are ununited.

#### Mixing Pertussis Vaccine and Diphtheria Prophylactic

Q.—I am using the pertussis vaccine (Intel) for immunizing infants against whooping-cough. Since this is carried out at about the same age as the immunization against diphtheria, is there any objection to mixing the pertussis vaccine and the A.P.T. together in the same syringe and giving it as one injection? I am using the dosage suggested by you—viz., three injections of 1.0, 1.0, and 2.0 c.m. of 20,000-million-organisms-per-c.c.m. vaccine with a week's interval between the first and second injections and a month between the second and third. If the vaccine and A.P.T. can be mixed, the A.P.T. could be incorporated in the second and third injections (giving a month's interval) and thus avoid two further injections.

A.—But is immunization against pertussis best carried out at the same time as against diphtheria? Pertussis attacks and kills many babies in the first few months of life: therefore immunization should be begun early. On the other hand little diphtheria is recorded under the age of twelve months; and, moreover, some children do not develop immunity satisfactorily if injected with diphtheria prophylactic much before their first birthday. Few authorities practise immunization of children against diphtheria until the twelfth, or at the earliest the ninth, month. On the point of mixing, it is probably true that prophylactics made in the same way and containing the same antiseptic may be mixed without loss of efficiency—e.g., T.A.B. and those founded on it. But it cannot be accepted that different prophylactics—e.g., a toxoid and a vaccine containing different antiseptics—can be mixed for a short or longer time before injection with perfect safety and without the possibility of some unexpected effect on the prophylactics (Bousfield has called attention to this point.) The reputable manufacturer, to be sure of his ground, would mix the two prophylactics—in this case diphtheria and pertussis—and then apply to the mixture the same tests for proof of protecting power as had been applied to the separate constituents. And that raises the question: What tests of protecting potency had been applied to the batch of pertussis vaccine? McFarlan and Elizabeth Topley in the November *Monthly Bulletin* of the E.P.H.L.S. report an investigation in which the pertussis vaccine used had afforded no protection. They suggest that the vaccine may have been inefficient or the dosage may have been too low; no data were available about its power to protect mice or produce antibodies in human beings. One would guess from the excellent figures for protection in several campaigns in the U.S.A. that at least some of the pertussis prophylactics used there would protect mice and produce antibodies. Until such vaccines are generally available in England perhaps the questioner would hold his hand.

#### A Complicated Case

Q.—A lady aged 65 has had rheumatoid arthritis for some 10 to 15 years, mainly in the fingers, wrists, toes, and knees. A few years ago I found she was also suffering from pernicious anaemia. This has much improved with intramuscular liver injections. In the past month she has developed severe pruritus and vulvae, spreading down the inner side of the legs, and recently she has become more sensitized—with areas of dermatitis on the thighs and arms. I have tried her on various remedies. Would oestrogen help? There is no local cause to be found in the anal canal or vagina. She has no vaginal discharge; urine is normal—no sugar, no albumin.

A.—The answer to this question can be divided into three separate items: (1) Rheumatoid arthritis and pernicious anaemia, it may be assumed, must have some effect on the other states, but only indirectly. (2) Pruritus vulvae et al. is usually responsive to small doses of x rays. (3) The dermatitis or eczema will best be relieved by rest and simple local applications, such as ichthyol 2% in oily calamine. Some form of sedative is called for. Oestrogen treatment may be tried, although there is no constructive indication for its use. This case appears to present one of those complex and difficult problems where the practitioner can often plan out treatment by drawing up a sort of schedule on a sheet of paper and working out separately the symptoms and their remedies.

#### Ergotamine Tartrate for Migraine

Q.—What is the mode of action of ergotamine tartrate in removing the headache of migraine? Is it useful for other forms of headache? Is there any danger in long-continued use or increase of dosage? I have used it by injection as the oral route is not effective.

A.—It seems likely that ergotamine tartrate removes the headache of migraine by causing vasodilatation in the cerebral blood vessels, which results in increased cerebral blood flow. Whereas ergotamine causes vasoconstriction in vessels elsewhere in the body, workers in Heymans's laboratory in Ghent showed that in the head ergotamine

caused vasodilatation. Ergotamine tartrate is now known to be useful for other forms of headache. There is danger in too frequent use of the drug, for it causes gangrene of the extremities. It was formerly used in obstetrics, and cases are on record in which its administration was accidentally continued for a long period and resulted in gangrene. It is impossible to say what intervals should elapse between doses—probably a week. Ergotamine is not inactive by mouth, but the onset of its action by mouth is slow and gradual, the earliest effect appearing 20 minutes after the drug is taken.

#### "Bowel-consciousness"

Q.—Why does the tongue get furred in the constipated?

A.—In a healthy subject who is constipated there is no furring of the tongue. Many conditions, ranging from minor visceral neuroses and dietetic indiscretions to acute fevers with dehydration and gastro-enteritis, may be responsible for the association, but the furred tongue is no more the result of the constipation than the constipation is the result of the furred tongue. The successful propaganda of patent medicine firms has made the public over-conscious of its bowel habits, and the poor appetite and unpleasant gastro-intestinal symptoms of many patients with constipation are tributes to its powerful influence in provoking a psychosomatic disorder. If doctors and nurses were to make a determined effort to defeat the ill effects of these unfortunate advertisements there would probably be far fewer people who "suffered" from constipation.

#### Destruction of Vitamin C

Q.—(1) How is it that the rather prolonged boiling of fruit in making jam does not destroy vitamin C? Is it that vitamin C is not so easily destroyed by heat as we used to believe? (2) Is it the case that fruit bottled by ordinary domestic methods retains its vitamin C content? (3) Can you recommend any publications giving up-to-date information on the present knowledge of vitamins in a compact and practical form useful to general practitioners and dietitians?

A.—The stability of natural vitamin C in ordinary domestic cooking is now known to be much greater than was previously believed. For instance, in the cooking of leafy vegetables by boiling, or in the stewing of fruits, although extraction into the cooking liquor is usually of the order of 50%, destruction of the vitamin is frequently less than 10%. It must be remembered that in all boiling, stewing, and bottling processes oxidation by direct contact of the material with air is largely prevented by the protective layer of steam produced in the cooking process. Oxidation of vitamin C is, however, accelerated if (1) the enzymes present in the fruit or vegetables are liberated (for instance, by damage to the plant tissue before use) and allowed to act before being destroyed by heat; (2) free access of oxygen is permitted while the material is still hot (as shown by the rapid destruction of the vitamin when vegetables are "kept hot"); (3) cooking is carried out in a markedly alkaline medium (this is unusual in domestic practice even when soda is used for green vegetables); or (4) contamination with metallic ions such as iron or copper occurs. In making jam it is possible to control all the above factors so that the destruction of vitamin C is negligible, but if such control is not exercised, then naturally a proportional loss of the vitamin is to be expected. Similarly, it is possible to retain a high percentage of the vitamin C content of fruit on bottling by approved domestic methods.

While it is difficult to recommend publications on vitamins which are compact, practicable, and at the same time up to date, the following should be found useful: Harris, *Vitamins in Theory and Practice*; Fixsen and Roscoe, "Tables of the Vitamin Content of Human and Animal Foods," II (1940), *Nutrition Abstracts and Reviews*; Booher, Hartzler, and Hewston, *A Compilation of the Vitamin Values of Foods in Relation to Processing and Other Variants*; Circular No. 638, May, 1942, United States Department of Agriculture; Oliver, "Ascorbic Acid Values of Fruits and Vegetables for Dietary Surveys," *Chemistry and Industry*, 1943, vol. 62, No. 16, pp. 146-8; Harris, "Vitamins," *The British Encyclopaedia of Medical Practice*.

#### INCOME TAX

##### Accounts for Two Years: Contributions to War Damage

B. J. states that the practice audit was not done for two years, but the income-tax assessments were increased. Secondly, two houses are mortgaged; can a claim be made on the mortgages for a share of the war damage contribution and income tax?

•• (1) The Income Tax Acts assume that yearly accounts are prepared and do not provide for cases where the account covers two years. B. S. should get in touch with his inspector of taxes and suggest that the adjusted profit shown by the two-years account should be regarded as earned evenly over the two years and the income-tax assessments adjusted on that basis.

(2) The position as regards war damage contributions depends on several conditions. These are set out in a pamphlet (known as Form W.D.7.) which can be obtained from the Regional Office of the War Damage Commission. Income tax can be deducted at the

standard rate from mortgage interest paid to a private concern. If it is paid to a building society the normal practice is for a deduction to be made from the tax assessed under Schedule A on the property to give the appropriate relief; the inspector of taxes can say whether this has been done.

#### "Pay as You Earn"

H. M. is assessed under Schedule E and has received a notice that the collector has been authorized to accept 5/6ths of the tax charged for the year 1943-4, because as from April 6 next he will be assessable under the new system on the current year's basis and pay tax currently by deduction.

.\* This is correct. It is true that H. M. has been assessed for a year's income for each year of his employment and that at one time the assessments were on the current year's basis. But he has not yet accounted for tax on his earnings from April 5, 1943, and when April 5, 1944, is reached would normally be owing a further seven months' tax—the deductions for the 1943-4 tax having started in November, 1943. So H. M. will in fact benefit by the cancellation of seven months' tax, because once the deductions have started after April 5, 1944, he will be up to date instead of being seven months in arrears with his payments.

#### Post-war Credit

I. H. has received a notice, the final figures of which are:

	£	s.	d.	£	s.	d.	
Earned income relief .. .. .	19	7	0				
Personal allowance .. .. .	20	0	0				
Amount of allowances ranking for post-war credit .. .. .				39	7	0	
Tax on above .. .. .	£23	7	0	@ 6/6 =	7	11	9
	£16	0	0	@ 10/- =	8	0	0
					15	11	9

He suggests he should not pay income tax on his post-war credit.

.\* The figures are not perhaps set out as clearly as they might have been. What it is intended to convey is that £39 7s. is the amount on which the income-tax post-war credit is due, and that that credit is £15 11s. 9d.

#### Earnings of Married Woman

D. G. is married to a professional man. Last year she earned £89 4s. 6d. for part-time clinic work, and £18 19s. 10d. income tax has been charged on those earnings. Is that correct?

.\* We assume that D. G.'s husband has had the maximum earned income relief (10% on £1,500 = £150), and that the assessment is made as for the year ended April 5, 1943. On that basis the assessment should be:

	£	s.	d.
Amount of income .. .. .	89	4	6
Wife's earned income allowance .. .. .	80	0	0
Balance .. .. .	9	4	6
Tax @ 10/- in the £ .. .. .	4	12	3

(The special allowance for the wife's earnings was increased from £45 to £80 for the year ending April 5, 1943, and following years.)

## LETTERS, NOTES, ETC.

### Horse Transport and Diarrhoeal Diseases

JOHN FOLEY, B.Sc. (London, W.C.2) writes: While, as you point out in the editorial on the increase in diarrhoeal diseases among children during the war (Jan. 29, p. 155), there are many factors contributing to this increase, there is another which goes unnoted—the increased use of horses in the larger towns. It would be of interest if some statistician would compare the changes in the deaths due to diarrhoeal diseases with the reduced use of motor cars and the rise in the use of horse transport during these war years. It is clear from quite superficial study that the increased amount of horse dung deposited in the streets of the towns cannot, owing to labour shortages, be disposed of as quickly and effectively as the smaller peacetime quantity. The death rates have increased in just those places where there is the greatest increase in the change over from petrol to horse transport—i.e., the larger towns. Some years ago, before the war, I had occasion to meet many of the paediatricians attached to the London hospitals. There were often comments that the incidence of diarrhoea and vomiting in infants had fallen considerably since the virtual replacement of the horse by the internal combustion engine. Should some parallel be clearly shown in the suggested comparison, then the authorities would have to consider the lives risked and lost in the transport across the seas of fuel necessary to enable commercial users of horses to revert to mechanical power, and their value compared with those of the children dying from diarrhoeal diseases carried by flies breeding on the horse dung on the roads.

### Hereditary Cold Fingers

Dr. E. C. CURWEN (Hove) writes: In the reply to a question on this subject in the *Journal* of Jan. 15 (p. 103) it is stated that drug treatment is unlikely to be effective. I have a patient who for the last 7 years has been on a regular daily dose of benzedrine (15 to 20 mg.) on account of constitutional lethargy and somnolence. Previous to taking this drug he used to suffer from numb, white, painful fingers when the body as a whole became chilled. During the time that the benzedrine has been administered there has been no return of the finger condition at all, though, curiously enough, he finds cold weather more difficult to endure than he did before.

### Examining School-children

Dr. V. V. BROWN (Bristol) writes: At the moment, when there is so much talk of education and of school medical services, I am very disturbed by information which I was given by a school-master recently. He is on the staff of a school with 500 pupils, and he tells me that prior to the visit of the school medical officer the pupils' height, weight, and visual acuity are recorded by members of the teaching staff. Although I have the greatest admiration for the teaching profession, I feel sure that, even with the best of intentions, these records are not likely to approach the required standard of accuracy unless they are completed by a member of the medical or nursing profession. Is it reasonable to suppose that a school-master would take the necessary care or that he would be sufficiently conscious of the importance of these records?

.\* It is tentatively suggested by Dr. Margaret L. Foxwell in an article on the School Ophthalmic Service in *Public Health* (August, 1943) that school-teachers should carry out visual acuity tests because, among other reasons, they are most likely to "notice such habits as blinking, head tilting, periodic squints. . ."

### Backache and Renal Disease

Dr. E. WEATHERHEAD writes: In the article by four medical officers of the Air Services in the *B.M.J.* of Jan. 8, entitled "Influenza 'A': Account of a Minor Epidemic," the following rather surprising statement is made: "Severe low backache was experienced by two or three patients, and had there not been an epidemic of influenza this might easily have been mistaken for a renal condition" (italics mine). We are not told of any other symptoms in these patients suggestive of renal disease. Surely, backache—which is generally acknowledged to be the commonest of all symptoms, occurring in an extremely wide variety of conditions—takes a very minor place in renal disease except in "Newspaper Medicine" or advertisements in which the sufferer's attention is generally directed to his kidneys. The other, and far more important, symptoms and signs of nephritis or other form of kidney disease would at once enable the physician to distinguish the condition from influenza.

### Speculation

Dr. A. N. MACBETH writes: Your inquirer (Nov. 20, 1943, p. 666) might be informed that the ordinary myxoedematous thyroid is refractory to thyrotrophic stimuli, the ordinary myxoedema being a primary failure at the thyroid level. Sharpey-Schafer finds that some cases of ordinary myxoedema show a residual response to the trophic factor, but this can be elicited only by very high doses. The myxoedema that occurs secondarily to pituitary depression is rarer, and it is to this type alone that his queries could be applied. A recent issue of the *Journal of Mental Science* refers to the occurrence of material increases of pituitary secretion of one kind or another following electrical convulsive therapy. Such increase may of course be confined to cases whose original output was low.

### Unusual "Deficiency" Diseases in Barbados

Dr. M. LATTEY (St. Georges, Bermuda) writes: While working in Barbados I saw many deficiency diseases, and found two conditions which I have not seen described anywhere. I should like to know if anyone else has seen them. The first I have called "deficiency nephritis." I saw it only in children, and it is characterized by generalized oedema, and by large quantities of albumin and hyaline and granular casts in the urine. Hospitalization alone, on the usual hospital diet, had no effect on the disease, even after two weeks, but when thiamin chloride was given the condition cleared up in a few days. This was presumably a form of beriberi, differing in that I have never seen renal lesions described in beriberi. Albuminuria is seen in protein starvation, but if this were protein starvation it would presumably have been improved by the hospital diet. The second condition was a frequent accompaniment of the angular stomatitis of vitamin B deficiency, and consisted of sores at the end of the prepuce. These sores were similar in appearance to the sores at the corners of the mouth, were usually at the same stage of development, and were likewise healed by the administration of vitamin B complex. The Kahn test was negative in all cases in which it was done.

# BRITISH MEDICAL JOURNAL

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## SOME OBSERVATIONS ON HOSPITAL DUST WITH SPECIAL REFERENCE TO LIGHT AS A HYGIENIC SAFEGUARD

BY

LAWRENCE P. GARROD, M.D., F.R.C.P.

Professor of Bacteriology in the University of London; Bacteriologist to St. Bartholomew's Hospital;  
Pathologist to an E.M.S. Hospital

Dust has been recognized as a vehicle of infection for many years, but preoccupation with "droplet" spread has obscured its true importance until recent times. The first of a series of modern studies revealing the actual infectivity of dust was that of Cruickshank (1935), who found that haemolytic streptococci could readily be cultivated from the air and dust in the burn wards of the Glasgow Royal Infirmary, where most of the patients were infected by these organisms. Elizabeth White (1936), working with Colebrook at Queen Charlotte's Hospital, showed that dust in single rooms used for patients with streptococcal puerperal fever contained the same streptococcus, and that sweeping and bed-making increased the numbers recoverable in plates exposed to the air. In one such room these proceedings were carried on for experimental purposes after the patient had left it, and the sweeper developed a throat infection due to the same type of streptococcus. It was also shown that streptococci in artificially infected dust will survive for 10 weeks, and that their mouse virulence is undiminished after 25 days. The infectivity of dust is also evident from the observations made by Brown and Allison (1937) in scarlet-fever wards. Diphtheria bacilli may also exist in floor dust in large numbers in the neighbourhood of infected patients; Crosbie and Wright (1941), who demonstrated this, also found that this organism can survive in stored dust, retaining its virulence, for as long as 102 days.

Cross-infection, by dust or otherwise, is particularly liable to occur in wards where there are many open wounds, and the war therefore concentrated attention on its mechanisms. The observations of Miles *et al.* (1940), Hare (1941), and Thomas (1941) have confirmed and extended our knowledge of dust-borne streptococcal infection, and the precautions necessary to prevent it are described in M.R.C. War Memorandum No. 6. The oiling of floors (van den Ende, Lusb, and Edward, 1940; Thomas, 1941) and of bed-clothes (van den Ende and Spooner, 1941; Thomas and van den Ende, 1941; van den Ende and Thomas, 1941) is now recognized as a valuable safeguard in diminishing the amount of atmospheric dust, and thus the chances of cross-infection by this means.

The original purpose of the work described in this paper was to determine how far dust is responsible for cross-infection in surgical wards, and how much cross-infection is to be ascribed to other causes. This aim was not reached, except in showing that, under the conditions existing in some of the wards studied, dust is so infective that, without the aid of any other vehicle, it could well have caused all the accidental infections observed. Owing to novel and unexpected features in the results obtained, a study was then made of the conditions governing the survival of haemolytic streptococci in dust.

### Methods

An ordinary sample of dust can easily be obtained by rubbing the dusty surface with a swab as used for throats or wounds: a large amount of dust, particularly of the fluffy variety, readily adheres to the cotton-wool. A few drops of sterile water were added to the tube containing such a swab, and a suspension of the dust was obtained by vigorously rotating the swab in this fluid. A loopful of this thick suspension was then sown on a 1 in 500,000 gentian-violet blood-agar plate (Garrod, 1942). The growth of almost all indifferent bacteria in dust, including all species of *Bacillus*, staphylococci, micrococci, *Sarcina*, diphtheroids, moulds, and yeasts, is inhibited on this medium, while *Str. pyogenes* grows freely and characteristically. So selective is the medium for this organism that almost pure cultures are sometimes obtained from an inoculum which on plain media would yield a confluent growth of bacteria classed in other circumstances as contaminants. That a thick suspension of what is really dirt should give either a nearly pure growth of a pathogen or an almost sterile plate is surprising, but it is a constant finding. *Vibrios* streptococci (not usually of a type found in the mouth) and occasionally coliforms are the only other organisms commonly encountered. All haemolytic streptococci were grouped, and disregarded if not found to be of Group A: in some cases, when their precise identity was of interest they were typed. I am greatly indebted for this typing to the kindness of Dr. S. D. Elliott and to Dr. Dora Colebrook, of the Research Laboratory for Streptococcal Infections, Medical Research Council. For some purposes, to be described later, dust was collected by other methods, and studied quantitatively.

### Distribution of Streptococci in Dust

Most of the observations hitherto made on dust-borne streptococcal infection have reference to floor dust. That this may be heavily contaminated with haemolytic streptococci, particularly under and around the bed of an infected patient, was amply confirmed in the present study. On one occasion a heavy throat carrier, whose condition was entirely unsuspected, was detected in the first instance by the discovery of very large numbers of haemolytic streptococci in the floor dust near her bed in an isolated corner of the ward. This was an 18-bed ward in which there had been a case of scarlet fever, while four other patients were known to be infected, either in a wound or in the throat. The floor was swabbed in the neighbourhood of each occupied bed, and while at least a few haemolytic streptococci were found in nearly every specimen (one exception being the floor beneath the bed previously occupied by the case of scarlet fever: this proved on inquiry to have been treated with dettol), the numbers were much greater in the neighbourhood of known infected cases and of the unsuspected carrier mentioned above.

This grossly infected ward was on the ground floor. Windows on the ground floor of this (E.M.S.) hospital are protected by brick blast walls built up to within 34 in. of the top of the

window at a distance of only 7 in. from it, thus shutting off the lower 4 ft. of the window completely. These wards are therefore very badly lighted, whereas wards on the first floor have no such protection and are well lit. Multiple specimens of floor dust were collected at various times from three ground-floor and three first-floor wards where cases of haemolytic streptococcal infection had occurred, usually in circumstances suggesting cross-infection, and there was a very marked difference between them in the frequency of positive findings (Table I):

TABLE I.—Number of Specimens of Floor Dust containing (+) and not containing (−) Haemolytic Streptococci

	−	+	% +
Ground floor .. ..	21	55	72
First floor .. ..	27	6	18

The two groups of wards were not strictly comparable, either in the circumstances prompting the investigation, which naturally varied, or in the type of case treated; but the difference between them was so evident as to suggest the overriding operation of one factor, and one possible factor appeared to be light.

Evidence capable of the same interpretation was being obtained at the same time in a different way. Dust was collected not only from the floors but from other surfaces on which it accumulated. The thickest dust (neglect of which is explained by shortage of domestic labour and lack of vacuum-cleaning facilities) was to be found on the black-out screens. Each window was obscured at night by lowering four hinged screens placed one above the other, and made of fibre board in a light wooden frame; by day these were hoisted and held by cords at an angle of about 70 degrees to the window. The sloping surface thus facing the ward, enclosed in a wooden frame over half an inch in depth, readily collected dust. Samples obtained from these screens and from parts of the windows themselves (e.g., upper surface of lower sash) form the first category in Table II. The second is a smaller category of sites intermediate in level between the window and the floor (skirtings and low shelves); the third consists of floor-dust specimens only. The figures refer to specimens from both ground-floor and first-floor wards.

TABLE II.—Number of Specimens of Dust containing (+) and not containing (−) Haemolytic Streptococci

Source	−	+	% +
Screens and windows	42	0	0
Skirtings, etc. .. ..	13	9	41
Floors .. ..	48	61	56

The difference in distribution here is clearly significant, and could be interpreted in the same way. Dust on or close to windows, and hence much more exposed to light than anything else in the ward, is, so far as these observations go, consistently free from haemolytic streptococci. It does not appear to differ in nature from floor dust, being composed mainly of blanket fluff, although it is lighter in colour owing to relative freedom from admixed dirt of various other kinds. It is possible, however, that a closer analysis of dust deposited at various levels might reveal unsuspected differences in composition.

In all the ground-floor and one only of the first-floor wards studied the floors were treated with spindle oil. This is known not to disinfect dust, but merely to prevent its diffusion. There is no apparent reason, on the other hand, why it should encourage the longer survival of streptococci, or otherwise so act as to complicate the interpretation of these findings.

#### Action of Light on Haemolytic Streptococci

Dust is an inconstant and difficult material to work with, and it seemed better to get further information about the action of daylight on streptococci by using some other medium. Buchbinder *et al.* (1942) obtained data on this subject by spraying organisms into the air, whence they settled on filter papers in Petri dishes; after exposure to various types of light these were cultivated. *Str. pyogenes* survived only 65 hours

in the dark under these conditions, which therefore seem unfavourable to the organism. Exposure to daylight (no sunlight) sterilized these preparations in about four hours. C. R. Smith (1942), studying the survival of tubercle bacilli after failing to detect them in dust from rooms occupied by sputum-positive cases, dried either culture suspensions or sputum on cover-slips, and exposed these in an unglazed north window. He found that the bacilli in these films were usually dead within four days, whereas in a drawer in the same room they survived for two or three months, and in a refrigerator for over six months. Survival was longer in films made of sputum. The use of natural material is clearly preferable, and Smith's method was adopted with modifications for the present purpose.

**Experiments with Films of Dried Pus.**—Pus containing haemolytic streptococci was diluted with sterile glass-distilled water (1 in 2,000 in the first experiment; 1 in 20 and 1 in 5 in later experiments), and a loopful of this dilution was allowed to dry. These slides, of which as many as 60 were made for each experiment, were placed film upwards in Petri dishes, and sets were kept in each of three or four situations: (1) the ledge immediately inside a first-floor laboratory window facing south; (2) the ledge inside a window on the opposite side of the same laboratory—i.e., facing north and never exposed to direct sunlight; (3) a dark cupboard in the same laboratory; (4) a refrigerator at about 4° C. Cultures were made, at lengthening intervals, by adding enough blood agar (about 4 c.cm.) at 46° C. to form an adequate layer over the slide. A confluent haemolytic growth from the area of the film was succeeded later, as the number of survivors fell, by diminishing numbers of discrete colonies and eventually by total sterility. The results of four such experiments are given in Table III.

TABLE III.—Survival of *Str. pyogenes* in Dried Films of Pus

Date of Start of Experiment	Dilution of Pus	Number of Days of Survival*			
		South Window	North Window	Cupboard	Refrigerator
Sept. 7, 1942 ..	1 in 2,000	<1	6-8	>18	
Nov. 11, " ..	1 in 20	3-4	7-11	31-45	
Nov. 13, " ..	1 in 5	10-13	13-17	75-92	>92
Mar. 6, 1943 ..	1 in 5	6-9	13-19	103-110	41-52

\* The first figure given is the day of the last positive culture, the second the day of the first negative: > means all films used before a negative was obtained.

The increasing concentrations of pus were used, as it was found that these thicker films were sterilized by exposure to ultra-violet light, and were thus suitable objects for testing the bactericidal action of other kinds of light. (For exposure of these films and other materials to measured doses of ultra-violet light I am indebted to Dr. L. D. Bailey and Miss G. H. of the physiotherapy department of this hospital.)

These observations tally with those of C. R. Smith. The streptococci died most rapidly in a position exposed to daylight, in spite of this having to traverse two layers of ordinary glass (the window and the Petri dish); survival was natural longest in the experiment begun in November. Diffuse daylight in the north window was also lethal within 13 days or less, whereas in a dark cupboard in the same room, and hence under identical conditions apart from light, survival was prolonged for many weeks. Survival was longest in the refrigerator in one of the two experiments employing this site; in the second, sterility after 52 days is unexplained, but may possibly have been due to the action of some noxious vapour.

#### Action of Light on Infected Dust in Vitro

Two attempts were made to assess the bactericidal action of natural light on haemolytic streptococci in dust. This was obtained by vacuum-cleaning from floors known to be infected and weighed in tubes, the contents of which were subsequently scattered in Petri dishes, and placed either on the north window ledge or in the cupboard already mentioned. Counts of colonies in pour-plates of gentian-violet blood agar from measured inoculum of volumetric suspensions showed little change in the cupboard dust and a fall of the order of 90% in the window dust within a few days; but duplicate counts

varied, owing evidently to lack of homogeneity in the material. This experiment was done in July. A much more elaborate repetition was begun in January, when heavily infected dust was obtained by passing a vacuum-cleaner over the bed-clothes of four patients known to have haemolytic streptococcal infections. This dust was filtered through gauze to remove coarse particles, yielding a dense fine grey powder, of which 10 mg. was kept in each of many tubes either in the dark or exposed to north daylight, and cultivated quantitatively from time to time. Neither in tubes nor in Petri dishes in which their contents were subsequently spread out as far as possible did this dust cease to yield haemolytic streptococci in culture until April 2, the experiment having been begun on Jan. 18. Winter conditions may have accounted partly for this long survival, but a more important reason was probably the nature of the material itself; ultra-violet light failed repeatedly under various conditions to kill more than a proportion of the streptococci in it, and it may be that dust in this artificially concentrated form is more protective to contained bacteria than the looser aggregations of natural dust.

The main interest of this experiment was the survival period in the dark. The original number of living haemolytic streptococci per gramme of dust was 204,000; succeeding counts were 176,000 on Jan. 25; 5,900 on March 19; 8,700 on April 2; 2,700 on May 4; 700 on June 4; and 300 on August 2, when the last available tube was cultivated. The three colonies in this last culture were all of Group A, and had sent to Dr. Elliott proved, as did a subculture from the plate of June 4, to be of Type 11. This type was responsible for the epidemic in progress in the ward when the dust was collected six and a half months earlier (195 days). This is the longest survival on record.

### Discussion

These imperfect observations are placed on record in order to draw attention to the possible importance of good natural illumination as a hygienic safeguard, and in the hope that they may lead to further study of this subject. Although good lighting is universally recognized as desirable, it has never, so far as I am aware, been insisted on as a prime necessity in wards for septic surgical cases. This study suggests that in such wards it has an important part to play, particularly if to special measures (such as the oiling of bed-clothes and vacuum dust extraction) are taken to prevent the atmospheric diffusion of dust. It has been shown that haemolytic streptococci naturally present in dust will survive for over six months in the dark. It was noticeable that dark corners on the floors of infected wards were always more liable to yield dust containing haemolytic streptococci than more open situations; one dark recess beneath a bookcase was repeatedly sampled, and never failed to yield them. Prolonged ward epidemics with long intervals between fresh cases are readily explicable in such conditions. It was also found that dust on or close to windows never contained haemolytic streptococci, whether exposed to direct sunlight or not. Whether this is an effect of light, or is partly or wholly explicable on other grounds, can only be settled by further observations.

The quantitative study of bacteria in natural dust *in vitro* is beset by difficulties, and it is not claimed that direct proof of the disinfectant action of light on this material has been obtained. Of the action of light on haemolytic streptococci in another natural medium there can be no question; dried films of pus are of the same nature as infected dry particles liberated from a wound dressing, and form an unexceptionable test object. These are sterilized within a few days by diffuse north daylight passing through two layers of glass, whereas in the dark the streptococci in them remain viable for weeks. My observations on this point differ from those of C. R. Smith, since no glass was interposed between his cover-slip films and the northern sky of California. Preoccupation with the ultra-violet part of the spectrum has led to a common belief that only direct sunlight is usefully bactericidal; it must now be recognized that ordinary diffuse daylight, even on a cloudy day and even in winter in England, can be lethal to bacteria, and that glass is no absolute bar to this effect. The conditions governing this type of light effect would evidently repay further investigation from several points of view.

### Summary

In wards where there are patients with haemolytic streptococcal infections dust may contain these organisms in large numbers, particularly near infected patients' beds.

Haemolytic streptococci were found to be most numerous in floor dust, and were absent from many specimens of dust in the same wards collected from sites on or close to the windows. They were more often found in dust from exceptionally dark wards than in comparable specimens from normally lit wards.

Haemolytic streptococci of Group A, Type 11, in naturally infected dust survived in small numbers in the dark at room temperature for 195 days.

Ordinary diffuse daylight is bactericidal to haemolytic streptococci. The interposition of glass does not prevent this effect, and it occurs even under winter conditions in England.

These facts suggest the possibility that good natural lighting may be a factor in preventing the atmospheric spread of infection in surgical wards and elsewhere.

I am indebted for valuable technical assistance in this work to Miss P. M. Waterworth. Her services and the equipment of the laboratory in which most of the work was done were made available by the generosity of "Bundles for Britain," which organization provided a fund under the control of Mr. Rainsford Mowlem for laboratory work in connexion with his surgical unit. I am also indebted to the medical superintendent of the hospital for permission to publish these findings, and to Mr. Mowlem and other members of the surgical staff for allowing me to refer to cases and conditions in their wards.

### REFERENCES

- Brown, W. A., and Allison, V. D. (1937). *J. Hyg., Camb.*, 37, 1.  
 Buchmeier, L., Soloway, M., and Phelps, E. B. (1942). *J. Bact.*, 42, 353.  
 Crostie, W. E., and Wright, H. D. (1941). *Lancet*, 1, 656.  
 Cruickshank, R. (1935). *J. Path. Bact.*, 41, 367.  
 Garrod, L. P. (1942). *British Medical Journal*, 1, 290.  
 Hare, R. (1941). *Lancet*, 1, 85.  
 Miles, A. A., Schwabacher, Herta, Cunliffe, A. C., Ross, J., Paterson, Spooner, E. T. C., Filcher, R. S., and Wright, Joyce (1940). *British Medical Journal*, 2, 855, 895.  
 Smith, C. R. (1942). *Amer. Rev. Tuberc.*, 45, 334.  
 Thomas, J. C. (1941). *Lancet*, 2, 123.  
 — and van den Ende, M. (1941). *British Medical Journal*, 1, 953.  
 van den Ende, M., Lush, Dora, and Edward, D. G. ff. (1940). *Lancet*, 2, 133.  
 — and Spooner, E. T. C. (1941). *Ibid.*, 1, 751.  
 — and Thomas, J. C. (1941). *Ibid.*, 2, 725.  
 White, Elizabeth (1936). *Ibid.*, 1, 941.

## A NOTE ON THE TRANSMISSIBILITY OF HAEMOLYTIC STREPTOCOCCAL INFECTION BY FLIES

BY

R. A. SHOOTER, M.B., B.Ch.

AND

PAMELA M. WATERWORTH

(From the Pathology Department of an E.M.S. Hospital)

During the investigations described in the preceding paper by Prof. L. P. Garrod, when explanations were being sought for cross-infections in surgical wards, attention was directed to the possibility that these might be conveyed by flies. Wounds and septic dressings attract flies, and in some circumstances cannot altogether be protected from them.

In Sept., 1942, when flies abounded in this hospital, it was decided to catch some and cultivate them. They were trapped actually in a Petri dish containing blood agar, one half of the plate being spread with three drops of 1 in 3,000 gentian violet, as recommended by Fleming, and simply incubated in the plates, their busy wanderings on the surface of the medium being relied on to inoculate it with whatever bacteria might be on their feet. After overnight incubation the flies were found dead.

The flies were caught in two surgical wards where there were cases with streptococcal infections; a control series was caught in the laboratory. Of 27 flies caught in these wards 3 gave sterile plates, 9 gave cultures containing haemolytic streptococci, three of which proved to be of Group A, while the remainder grew a variety of other organisms, including coagulase-positive staphylococci and coliform bacilli: 2 plates were overgrown with *Proteus*. Of cultures from 22 flies caught in the laboratory 5 were sterile, 2 overgrown with *Proteus*, and the remainder grew a variety of unidentified organisms; there were no haemolytic streptococci in any culture.



Two of the three Group A strains isolated from ward flies proved to be of Type 4. Since a close check was being kept on all wound and throat infections in these wards, all Group A streptococci being typed by the kind co-operation of Dr. S. D. Elliott, it is possible to trace a hypothetical relationship between a carrier condition in these flies and infections in the human population of the wards. Type 4 had been identified only once previously—in a sore throat in a nurse ten days before the infected flies were caught; it is possible that this nurse conveyed the infection to a wound in which it escaped recognition. During the following two months Type 4 was recovered from eight further persons, six having wound and two throat infections. All these cases occurred in one of the two wards studied, and it was in this ward that both of the Type-4-carrying flies had been caught. After this stage two patients—one admitted to each ward—were found to have a Type 4 wound infection on admission, and 15 further cases in the two wards during an ensuing period of three months from that time are therefore not necessarily traceable to the earlier cases.

These observations do not prove the transmission of haemolytic streptococcal infection by flies, but they strongly suggest its possibility. When infection spreads otherwise inexplicably from one part of a hospital to another this agency should perhaps be considered.

Acknowledgments are due, as in the preceding paper, to the fund by which this study of wound infections was supported, and to Mr. Rainsford Mowlem. The work was done under the direction of Prof. L. P. Garrod, to whom we offer our thanks.

## THE HALDANE HAEMOGLOBINOMETER

### 1. IRON, OXYGEN, AND THE BRITISH STANDARDS INSTITUTION COLOUR STANDARD

BY

R. G. MACFARLANE

AND

J. R. P. O'BRIEN

IN COLLABORATION WITH

C. G. DOUGLAS    E. M. JOPE    H. M. JOPE  
R. H. MOLE        B. AMOS    AND    P. QUELCH

(From the Department of Haematology, Radcliffe Infirmary, Oxford, and the Departments of Biochemistry and of Physiology, University of Oxford)

For more than 40 years the Haldane-Gowers haemoglobinometer has been in general use in this country, and for most clinical purposes it has been a satisfactory instrument. When, however, its results, changed by means of the traditional conversion factors into units of oxygen capacity and thence into grammes of haemoglobin, are compared with those of other methods in other countries, a curious discrepancy is apparent which has led to much confusion. Added to this, there is now a demand for a high degree of accuracy, resulting from the widespread adoption of the haemoglobin level as an index of nutrition and of haemoconcentration in shock. Judged by this more exacting requirement, it has become only too clear that the instrument as generally used may give dangerously inaccurate and variable results, and that a complete investigation of its efficiency is urgently needed.

The establishment by Donaldson, Harding, and Wright (*J. Path. Bact.*, 1943, 55, 205) of a permanent B.S.I. Haldane colour standard, together with a means for accurate comparison at the National Physical Laboratory, has, for the first time, provided the essential fixed point on which such an investigation must be based. We have taken advantage of this standard in certain observations, which, though they have no claim to the desired completeness, may serve to guide further work. The problem of haemoglobinometry has been solved to their own satisfaction by a succession of workers during the past 60 years, but it still exists in all its complexity. We have at least avoided this one pitfall, of supposing our results to be final.

The first step in the present investigation has been an attempt to determine the mean oxygen capacity and iron content of blood of a colour equal to 100% of the B.S.I. colour standard. This attempt, which has met with unexpected difficulties, is here briefly described. The variability of the results of haemoglobin estimation by the Haldane-Gowers method under different conditions and in the hands of a large number of trained observers will be dealt with in a second communication. Finally, the puzzling systematic discrepancy between the results of this method and those of others, bound up as it is with the history of the Haldane standard, will later be discussed in the form of a review of the literature.

### Method of Investigation

**Material.**—Blood was taken by venepuncture, a tourniquet being applied for the minimum time necessary to produce adequate venous distension and being released at the instant of puncture. The blood was heparinized, and within a few minutes of collection was divided into the required number of sub-samples, the vessel being shaken continuously to ensure even sampling.

The subjects were healthy adults (members of the hospital staff and medical students), 29 being males and 20 females. Unfortunately these were not evenly distributed in chronological order, most of the females being towards the end of the series—a fact that has complicated analysis of the results. The figures obtained in one other case, including an obviously erroneous iron estimation, have been omitted.

The following determinations were made on each blood sample and (except for iron determination) on the day of collection.

1. *Oxygen Capacity* (H. M. Jope).—This was estimated by the constant-volume van Slyke method, all measurements being made with carefully calibrated apparatus. Duplicate or triplicate estimations were made and the mean figure taken. In 20 blood specimens the CO capacity was also determined as a check on oxygen measurements. In addition 11 estimations of oxygen capacity have been made by Prof. C. G. Douglas, using the Haldane blood-gas apparatus, in parallel with the van Slyke estimations. The results of the two methods are in good proportional agreement, though the Haldane method gives results averaging 0.35 ml. % lower.

2. *Iron Determinations* (J. R. P. O'Brien and P. Quelch).—Haemoglobin iron was estimated by the Klumpp titanous chloride method, the results being the average of duplicate determinations. The method was standardized against pure iron wire, and all apparatus was carefully calibrated.

3. *Ultra-violet and Visible Absorption Spectra* (E. M. Jope).—A Hilger E3 medium quartz spectrograph and a Spekker photometer with ribbon filament lamp were used. The plates were matched on a photo-electric microphotometer. The results in the visible range were checked by two estimations made in parallel with the National Physical Laboratory spectrophotometer. To save space only the ultra-violet readings are quoted, and these have been expressed as a percentage of the B.S.I. standard on the basis of six determinations in parallel with the N.P.L. comparator.

4. *Haemoglobin Estimations* (B. Amos and R. G. Macfarlane).—The Haldane-Gowers haemoglobinometer was used. B.S.I. standards, diluting tubes, and pipettes were employed, and the necessary correction factors were applied. Each estimation was the mean of independent determinations by both observers, except for a period when one was not available. About halfway through the series both observers made many observations in parallel with colorimetric determinations by the National Physical Laboratory to eliminate personal errors, and this procedure was followed by rather higher readings being obtained from this point onwards. At the time of each estimation the observers were in ignorance of any other estimation on that blood sample—a matter of importance in view of the great susceptibility of this method to bias. In addition to the estimation of colour by the Haldane-Gowers method, six samples of blood were sent to the National Physical Laboratory for direct comparison with the colour standard by means of the special comparator. The figures so obtained were in

correlated with the other estimations which had been simultaneously carried out in Oxford. This procedure was designed as a check on the visual estimations of colour, which were considered to be most liable to error.

5. *Red Cell Counts* (B. Amos and R. G. Macfarlane).—Red cells were counted, using N.P.L. certified pipettes and counting-chambers. The recorded figures were the means of duplicate independent determinations by both observers.

6. *Packed Cell Volume*.—Duplicate determinations were made in N.P.L. certified haematocrit tubes, spun for 30 minutes at 3,000 revolutions a minute at a radius of 5½ in.

### Results

(Analysed by R. G. Macfarlane and R. H. Mole)

Space does not allow more than the means and coefficients of variation to be given, and these have been arranged in tabular form. The complete figures have been deposited with the Medical Research Council, and can be seen if desired.

TABLE I.—*Determinations (V = Coefficient of Variation)*

Estimation	(A) Series of 49		(B) 29 Males	(C) 20 Females	(D) 6 N.P.L. Samples
	Mean	V (%)	Mean	Mean	Mean
Haemoglobinometer reading (% B.S.I. standard)	101.40	9.00	106.60	92.95	103.40
Spectrophotometer reading (% B.S.I. standard)	102.50	9.38	109.30	93.20	(By N.P.L. comparator) 103.40
Red cells ( $10^6$ per c.mm.)	5.23	8.39	5.51	4.82	5.30
Packed cell volume (%)	44.80	7.61	47.03	41.55	44.60
Oxygen capacity (ml./100 ml.)	20.11	9.15	21.30	18.37	20.34
Iron content (mg./100 ml.)	50.40	9.98	53.96	45.24	49.83

The means and coefficients of variation are given for the 49 sets of six estimations in Column A. Then follow the means for males and females separately, and finally those of the six samples in which the haemoglobin was estimated by the N.P.L. comparator. From these six samples it was calculated that  $\text{HbO}_2$ ,  $E_{1\text{ cm}}^{1.000}$  ( $\lambda = 414 \text{ m}\mu$ ) 1.18 was equivalent to 100% of the B.S.I. standard, and the spectrophotometric readings are given as a percentage of this extinction coefficient.

TABLE II.—*The Mean Equivalent of 100% B.S.I. Standard, as determined by the Haldane-Gowers Haemoglobinometer (H), the Spectrophotometer (S), and, in Column 5, by the N.P.L. Comparator in Six Cases*

Estimation		Series of 49			Last 24			Six N.P.L. Cases
		All 49	29 Males	20 Females	All 24	11 Males	13 Females	
Oxygen capacity (ml. per 100 ml.)	H	19.89	19.97	19.78	19.60	19.48	19.71	19.70
	S	19.55	19.46	19.70	19.70	19.51	19.83	
Iron content (mg./100 ml.)	H	49.81	50.59	48.65	48.66	49.16	48.24	48.26
	S	48.97	49.29	48.50	48.90	49.25	48.67	
Red cells ( $10^6$ per c.mm.)	H	5.17	5.16	5.15	5.14	5.12	5.16	5.19
	S	5.09	5.03	5.18	5.17	5.11	5.22	
Packed cell volume (%)	H	44.37	44.11	44.73	44.60	44.80	44.30	44.72
	S	43.60	42.98	44.59	43.80	42.80	44.70	
Spectrophotometer reading	H	101.70	102.50	100.20	99.40	99.80	99.10	100.00

In this table the results have been expressed as the mean equivalents of 100% haemoglobin measured by the haemoglobinometer, the spectrophotometer (indicated by the letters H and S respectively in Column 2), and, in the last column, by the N.P.L. comparator on six samples. The values for the whole series and for males and females are given separately in Column 3. It will be seen that the haemoglobinometer ratios are consistently higher than those of the spectrophotometer, suggesting that the average readings of the haemoglobinometer were about 2% too low. Analysis of the series in chronological groups shows a reduction in this discrepancy

about half-way through the series when estimations in parallel with the N.P.L. were begun. The resulting change in the statistics affected the sexes unequally, since there were more females in the second half of the series than in the first. It is for this reason that the results for the last 24 samples have been given in Column 4, and here it will be seen that the two methods of estimation agree to about 1% or less.

Despite these variations, the following points are clear from Table II: (a) The B.S.I. standard is equivalent to about 19.7 ml. O<sub>2</sub> per 100 ml. and about 49 mg. of haemoglobin iron per 100 ml., instead of the expected 18.5 ml. O<sub>2</sub> per 100 ml. and 46.25 mg. Fe. (b) There seems to be a sex difference in the relations between iron, oxygen, and colour.

TABLE III.—*The Coefficients of Variation (V) of the Ratios of Haemoglobin as estimated by the Spectrophotometer (S) and Haemoglobinometer (H) to Oxygen, Iron, Red Cells, and Cell Volume Estimations, and of Iron to Oxygen*

Ratio:	O <sub>2</sub> /S	O <sub>2</sub> /H	Fe/S	Fe/H	O <sub>2</sub> /Fe	S/H	R.B.C./S	R.B.C./H	P.C.V./S	P.C.V./H
	S	H	S	H	S	H	S	H	S	H
Series of 49	3.12	4.27	2.42	4.04	3.46	3.48	4.66	4.00	3.46	3.68
Series of 24	1.81	3.68	2.47	3.92	2.85	2.95	5.31	4.28	3.58	3.36

Some idea of the correlation of two sets of variables is given by the coefficient of variation (V) of their ratios. Table III contains the values for V of the ratios given in Table II. A range of twice the coefficient of variation above and below the mean will probably be found in a series of 22 such ratios, and serves as a useful index of the "probable range" of variation. On the figures for the whole series, and taking  $\pm 2V$  as the probable range, in 22 blood samples with the same spectrophotometric reading two estimates of the oxygen capacity may differ by as much as 12%, or 17% if the haemoglobinometer is used instead of the spectrophotometer. It will be seen in this series that the best agreement is between iron estimation and the spectrophotometer, with a "probable range" of less than 10%.

The figures for the last 24 subjects show a considerable reduction in the variability of the ratios in which oxygen estimation takes part, particularly in that of oxygen to spectrophotometer in which the "probable range" has been reduced to about 7%. This improvement is presumably due to technical advance in the oxygen measurements. The other ratios show variable changes.

TABLE IV.—*Other Ratios: Colour Index; Mean Corpuscular Volume; Mean Corpuscular Oxygen and Iron; Oxygen and Iron Concentrations; Oxygen per gramme of Iron; Mean Corpuscular Haemoglobin; and Haemoglobin Concentrations*

Ratio	Series of 49		29 Males		20 Females	N.P.L. Samples
	Mean	V (%)	Mean	Mean	Mean	Mean
Hb/R.B.C. (C.I.)	0.967	4.00	0.969	0.965	0.97	0.97
P.C.V./R.B.C. (M.C.V.: c.m.)	85.8	4.03	85.33	86.46	84.52	84.52
O <sub>2</sub> /R.B.C. (M.C.O.: c.m.)	38.48	4.08	38.69	38.17	37.95	37.95
Fe/R.B.C. (M.C.F.: $\mu$ )	0.0964	4.87	0.095	0.0939	0.093	0.093
O <sub>2</sub> /P.C.V. (O <sub>2</sub> : ml. 100 ml.)	44.85	3.76	45.29	44.22	44.96	44.96
Fe/P.C.V. (Fe: mg. 100 ml.)	112.35	3.82	114.76	108.84	110.02	110.02
O <sub>2</sub> /Fe (O <sub>2</sub> : ml. g. Fe)	359.5	3.46	394.5	406.3	408.1	408.1
Hb/R.B.C. (M.C.Hb: $\mu$ )	28.7	4.03	28.76	28.64	28.67	28.67
Hb/P.C.V. (Hb: g. 100 ml.)	33.5	3.68	33.6	33.2	33.95	33.95

In this table the means of other ratios are given, usually in a form that is already familiar. The ratio of colour estimation to red cell count, for instance, is given as the ordinary "colour index"; packed cell volume to red cell count as the "mean corpuscular volume." The figures for mean corpuscular haemoglobin and haemoglobin concentration have been calculated from the haemoglobinometer readings by the use of Hufner's factor, and on the assumption that 100% colour is equivalent to our observed figure of 19.7 ml. oxygen per 100 ml. Such a conversion, included here for comparison with the previous findings in the literature, is arbitrary and gives a false impression of accuracy. The oxygen capacity per gramme of corpuscular iron is very near the theoretical figure, but again it is of interest to observe the sex difference.

### Discussion

A difficulty in attempting to define the British Standards Institution colour standard in any terms except those of colour is the fact that other measurable attributes of haemoglobin, such as iron content and oxygen capacity, are not, as determined by us, strictly proportional to the readings obtained with the Haldane haemoglobinometer and the spectrophotometer. Part of this lack of proportionality is, of course, due to instrumental and technical defects, and it is evident that as our series progressed some of these difficulties were overcome to an extent that materially lessened the variability. Nevertheless, even in the latter part of our series blood samples of the same extinction coefficient as measured by the spectrophotometer might show estimated oxygen capacities differing by 7% and iron contents differing by nearly 10%, while if the haemoglobinometer is used as a measure of haemoglobin these differences are increased to nearly 15% and 16% respectively.

A further part of this variability may be due to the presence of inactive haemoglobin and/or non-haemoglobin iron, the presence of which in larger amounts in men than in women might explain our observed sex difference. It ought to be pointed out, however, that this series was not planned to determine the extent of such sex differences, which were, in fact, not expected. In consequence our efforts to arrive at a satisfactory estimate of their statistical significance have proved fruitless, and the usual criteria, being in this series misleading, have been omitted. It is therefore difficult, if not impossible, to say how much of the observed variation between colour, oxygen capacity, and iron content was due to technical error, and how much to a genuine difference from one sample to another. Thus it is desirable to repeat the observations in a further series that has been carefully planned beforehand to make such an analysis possible.

It is quite clear that, in our hands, there is a large variability in haemoglobin estimation by the Haldane-Gowers haemoglobinometer. If a further series is attempted some other and more precise method for estimating colour must be employed—preferably the efficient comparator as used by the National Physical Laboratory.

Despite these variations there seems little doubt that the B.S.I. colour standard is equivalent to a greater mean haemoglobin, oxygen capacity, and iron content than was expected, though it is still conveniently close to the haemoglobin level associated with 5 million normal red cells per c.mm. This finding has an interesting bearing upon the supposed difference between English and American normal haemoglobin values.

also raises the questions why and when the standard changed from Haldane's original value, or whether in fact the Haldane standard has always been underestimated. These matters will be fully discussed in the third paper in this series.

### Summary and Conclusions

We have observed a lack of proportionality in the results of haemoglobin estimations by the Haldane-Gowers haemoglobinometer, the spectrophotometer, oxygen capacity, and iron determination on 49 blood samples.

Part of this variation is obviously due to technical error, and a further part seems to depend on a sex difference in the relative proportions of colour, iron content, and oxygen capacity of haemoglobin.

The British Standards Institution Haldane colour standard is apparently equivalent to  $19.7 \pm 0.2$  ml. oxygen capacity per 100 ml. of blood, and  $49 \pm 0.8$  mg. of iron per 100 ml. Because of the variation already mentioned, more exact figures cannot be given at present.

The Haldane-Gowers method for estimating haemoglobin has shown itself to be insufficiently exact in our hands for purposes of standardization, and, in any future attempt to define the B.S.I. standard, should be replaced by the N.P.L. comparator.

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## THE HAEMOGLOBIN EQUIVALENT OF THE B.S.I. HALDANE STANDARD

BY

E. J. KING, M.A., Ph.D.

*Reader in Pathological Chemistry in the University of London*

MARGARET GILCHRIST, M.Sc.

*Research Assistant at the British Postgraduate Medical School*

AND

AUDREY MATHESON, M.B., B.S.

*Medical Staff, Ministry of Supply*

The classical procedure of Haldane (1900) for estimating haemoglobin in the blood has been widely used in this country for nearly half a century, and most of the records in the medical literature of haemoglobin concentrations are in terms of the Haldane standard. By estimating the oxygen capacity of the blood of 12 healthy male persons Haldane arrived at an average figure of 18.5 ml. of  $O_2$  per 100 ml. of blood. This figure he took to be the oxygen equivalent of "normal" adult blood, and he defined his 100% haemoglobin standard in these terms.

The Haldane method consists in saturating a measured quantity of blood in water with carbon monoxide, and diluting the cherry-red colour so obtained until it matches a standard 1 in 100 dilution of 18.5 ml.  $O_2$  blood which has been similarly gassed with CO. For convenience the standard CO-Hb solution has usually been sealed up in small test-tubes of standard dimensions, in which it has appeared to remain unaltered in colour for surprisingly long periods of time, in some cases for many years. The quality of the glass undoubtedly has an effect on the keeping quality of the CO-Hb solution, and where inferior glass has been used, Haldane standards have been known to become unusable because of an obvious change in colour.

This and other shortcomings in the routine Haldane procedure led Clegg and King (1942) to adopt an alkaline haematin method of estimating haemoglobin, which, they showed, was readily adaptable to precise colorimetric measurement in either Duboscq or photo-electric instruments. For this method a haemoglobin concentration of 15.6 g. Hb, equivalent to 20.9 ml.  $O_2$  per 100 ml. of blood (Haden, 1922), was used as the standard 100% of normal, as this figure appeared from modern work (e.g., Peters and van Slyke, 1932; Wardlaw, 1941) to be a more probable average of normal adults than the earlier, and lower, Haldane figure.

Previously, all haemoglobin estimations in the Hammersmith Hospital had been made by the Haldane method, and it was anticipated that the determined percentage values would show a sudden drop on introducing the new method and the higher standard. The change encountered was much smaller than was expected. This led us to suspect that our Haldane standards represented a higher haemoglobin concentration than the 13.8 g. per 100 ml. which is the equivalent of 18.5 ml. of  $O_2$ . We have therefore calibrated our tubes of Haldane standard by reference to a number of bloods whose haemoglobin content has been assessed by accurate iron analyses (titanous chloride method of Delory, 1943) and comparisons with photometric haematin results. Our Haldane tubes have been compared by the National Physical Laboratory with the Haldane standard prepared by Donaldson, Harding, and Wright (1943). These authors have recently attempted to standardize the Haldane method and to define accurately the colour of the tubes of CO-Hb which are used as standards for the routine comparisons. As a result of our measurements we have determined that the colour of the British Standards Institution Haldane standard is in fact equal to that given by blood of 19.8 ml.  $O_2$  capacity (14.8 g. Hb) per 100 ml., and not of its stated strength of 18.5 ml.  $O_2$  or 13.8 g. haemoglobin.

### Experimental Methods

**Taking of Blood.**—(1) Blood was drawn by venepuncture without stasis and delivered into bottles containing potassium oxalate. It was mixed by gentle inversion before measurement. (2) Free-flowing blood from the lobe of the ear was collected

capillary pipettes. The lobe was carefully dried before pricking, and the first drop of blood was discarded.

**Pipetting.**—All pipettes were calibrated "to contain."

**Iron Analyses.**—Duplicate samples of 10 ml. of blood were iced and analysed for iron by the titanous chloride procedure described by Delory (1943). The  $TiCl_3$  was made up in freshly distilled water saturated with  $CO_2$ . The standard iron-alum solution was referred to B.D.H. "extra pure" iron wire (99.6% Fe).

**Alkaline Haematin Determinations.**—These were carried out according to Clegg and King (1942).

**Haldane Determinations.**—(1) "Direct" Method:—0.02 ml. of blood was delivered into 0.4% ammonia solution in an N.P.L.-calibrated dilution tube, gassed with pure  $CO_2$  and diluted to match the standard tube. (2) "Indirect" Method:—In one set of comparisons of the Haldane with the alkaline haematin procedure an attempt was made to eliminate sampling errors in the following manner. A single sample (0.2 ml.) of blood was diluted with 9.8 ml. of  $N/20\ NH_4$ , 1 ml. of this haemolysed solution, equivalent to 0.02 ml. blood, was used for the Haldane estimation; and 3 ml., plus 3 ml.  $N/5\ NaOH$ , for the alkaline haematin procedure. The 1-ml. Ostwald pipette was calibrated to "blow out" and a correction factor used. The same 3-ml. pipette was used for measuring both the haemolysed blood and the sodium hydroxide solution, and so no correction factor was necessary. Since the same blood solution was used for both methods the 0.2 ml. and 9.8 ml. measurements did not require to be strictly accurate.

**Measurement of Colour.**—The alkaline haematin test solutions were compared with standard haematin solutions in a Dubosq colorimeter using mercury green light, or in a King (1942) photo-electric colorimeter with a Chance green light filter. The  $CO-Hb$  solutions were matched by dropwise dilution of the test solutions to match the standard in a Hawksley comparator. The tubes were repeatedly shifted from left to right and right to left, following the "titration" procedure recommended by Haldane. The adding of diluting fluid and matching of colours were done by one operator, and the observations and recordings of the readings by a second. All comparisons were made in duplicate, in the first 20 comparisons by different observers, and the duplicates averaged.

**Determination of Haldane Equivalents.**—Each Haldane reading was subjected to the corrections furnished by the National Physical Laboratory for the standard, the dilution tube, and the pipette. (The N.P.L. calibration figures for tubes and pipettes agreed closely with the calibrations for the same instruments which we determined ourselves.) The 100% equivalent of iron, or of oxygen or haemoglobin, was calculated for each blood, and the average equivalent then taken for each series of bloods analysed.

### Results

**Comparison with Iron Analyses.**—Table I gives the results of the analyses of samples of bloods taken from 20 healthy adults, most of them Army medical officers.

**Comparison with Alkaline Haematin Values.**—These are expressed in terms of mg. of Fe or g. of haemoglobin per 100 ml. of blood. Three separate series of comparisons have been made—two in the London laboratory and one in the Provinces under field conditions using a portable photo-electric colorimeter for the alkaline haematin measurements. The figures are set out in Tables II, III, and IV.

### Discussion

The agreement between these results, both internally in each series of determinations and as between series, is good. The deviations from the average are well within the limits of error encountered in colorimetric methods. They are, indeed, surprisingly small in view of the uncertainties of matching to a dilution type of colorimeter (cf. Macfarlane, 1943), and it should be emphasized that it was possible to obtain reliable Haldane readings only by a rigid observance of Haldane's "titration" technique of colorimetric matching. The operator was ignorant of the reading of his matching in each case, since the value was observed and recorded by a second person. With proper precautions, therefore, it is possible to obtain

satisfactory agreement between the Haldane and alkaline haematin methods, and with iron analyses of the blood. The agreement appears to be satisfactory whether the comparisons are made on the bloods of healthy persons, hospital patients,

TABLE I.—Comparison of Haldane Results with Iron Analyses on Normal Bloods (by  $TiCl_3$  Titration)

No.	Mg. Fe per 100 ml. Blood	B.S.I. Haldane Corrected Reading %	Mg. Fe/100 ml. eqv. of 100% B.S.I. Haldane
	A	B	C = 100 A/B
1	54.7	105	52.1
2	55.7	106	52.5
3	51.6	111	46.7
4	61.7	129	47.8
5	57.5	121	47.6
6	56.8	116	48.9
7	60.9	127	48.0
8	47.9	96	50.0
9	54.4	108	50.4
10	49.3	97	50.8
11	48.2	97	49.7
12	51.2	106	48.4
13	52.5	109	48.2
14	57.0	114	50.0
15	56.6	115	49.2
16	53.9	108	50.0
17	57.5	112	51.4
18	53.6	109	49.2
19	55.1	113	48.7
20	50.1	101	49.6
		Average	49.5
		Coefficient of variation (corr.)	3.02%

Note.—49.5 mg. Fe = 19.8 ml.  $O_2$  and 14.8 g. haemoglobin.

TABLE II.—Comparison of Haldane with Hoemin Iron Results on Normal Bloods (by Alkaline Haematin Method)\*

No.	Mg. Fe per 100 ml. Blood†	B.S.I. Haldane Corrected Reading %	Mg. Fe/100 ml. eqv. of 100% B.S.I. Haldane
	A	B	C = 100 A/B
1	54.4	105	51.8
2	55.0	106	51.9
3	52.4	111	47.3
4	63.9	129	49.5
5	60.2	121	49.7
6	59.3	116	51.1
7	62.2	127	49.0
8	47.5	96	49.5
9	54.2	108	50.1
10	48.8	97	50.3
11	48.8	97	50.3
12	52.0	106	49.1
13	53.0	109	48.6
14	57.4	114	50.3
15	56.1	115	48.8
16	51.9	108	48.0
17	56.1	112	50.1
18	52.0	109	47.7
19	54.4	113	48.1
20	48.3	101	47.9
		Average	49.5
		Coefficient of variation (corr.)	2.75%

\* 1 ml. blood diluted to 100 ml. with  $N/10\ NaOH$ .

† By comparison with haematin standard (haematin Fe equivalent of haemoglobin Fe = 1.3; cf. Clegg and King, 1942).

TABLE III.—Haemoglobin Equivalent of B.S.I. Haldane Standard derived from Comparison with Alkaline Haematin Method

Direct method (0.02 ml. blood for Haldane and 0.05 ml. for alkaline haematin):			
No. of blood specimens	..	..	30
Av. eqv. of 100% Haldane	..	..	14.85 g. Hb ( $\pm 0.48$ )
Coefficient of variation	..	..	3.21%
Indirect method (0.2 ml. blood diluted to 10 ml. with $N/20\ NH_4$ ; 1 ml. for Haldane, 3 ml. (+ 3 ml. $N/5\ NaOH$ ) for alkaline haematin):			
No. of blood specimens	..	..	32
Av. eqv. of 100% Haldane	..	..	14.82 g. Hb ( $\pm 0.38$ )
Coefficient of variation	..	..	2.53%

TABLE IV.—Comparison of Alkaline Haematin and Haldane Results in a Field Survey

No. of blood specimens	..	62
Coefficient of variation of Haldane* from alkaline haematin results	..	2.84%

\* Haldane standard taken to be equal to 14.8 g. Hb.

or industrial workers exposed to certain noxious chemicals. But it is improbable that the comparability would be as good with bloods containing a high proportion of methaemoglobin and sulphaemoglobin.

foreign object tends to produce strings of fibrin, which cause confusion in reading the results.) Set aside for five minutes, taking care to avoid drying up of the slide and soiling by dust. Rock the slide occasionally.

Results are read in from 5 to 10 minutes by the naked eye, and if necessary are confirmed by a hand-lens. The use of the low-power objective, as recommended by Steuer, is rarely necessary.

### Results

The tests were carried out on Egyptian labourers. Slides were taken in various camps under military control, were brought to the laboratory the same day, and were examined within the next 24 hours. In all, 640 persons were examined; 11 of these gave "slide-positive" results against OX 19, and 2 were positive to OX 2 in addition. These 13 were then followed up by a complete Weil-Felix reaction, using Dreyer's technique. The results are summarized in Table I.

TABLE I

Positive to OX 19	..	..	..	..	..	7*
Negative "	..	..	..	..	..	6

\* Of these 7 positives, 2 also showed agglutination in 1/50 against OX 2; and these two were the same persons who were slide-positive for OX 19 and OX 2.

The seven "slide- and Dreyer-positive" cases were further studied by carrying out a series of Weil-Felix tests at 4-day to 7-day intervals. The results obtained are shown in Table II.

TABLE II

Serial No.		1st Test	2nd Test	3rd Test	4th Test	Remarks
3	OX 2 OX 19	0 250	50 250	— —	— —	Had typhus a month before first test
4	OX 2 OX 19	50 50	50 125	50 500	— —	Not traceable afterwards
12	OX 2 OX 19	50 500	— —	— —	— —	Had typhus 3 weeks previously in hospital
19	OX 2 OX 19	0 500	— —	— —	— —	Not traceable: history not available
20	OX 2 OX 19	0 1,280	0 2,560	— —	— —	Hospital case: diagnosed typhus
21	OX 2 OX 19	0 250	0 1,800	— —	— —	Typhus with rash
22	OX 2 OX 19	0 250	0 250	0 1,250	0 1,250	Typhus with rash

Nos. 4 and 19, despite the history being unobtainable, should be considered typhus cases in view of the high titre. The others were definite typhus cases. It will thus be seen that all the clinical and Weil-Felix-positive typhus cases showed "slide agglutination" as well.

The results of the six slide-positive and Dreyer-negative cases (see Table I) are detailed in Table III.

TABLE III

Serial No.:	1	2	7	13*	15	17
OX 2 ..	0	0	0	0 0	0	25
OX 19 ..	0	0	0	0 0	50	50

\* Done twice, at five days' interval.

Except in two cases, there was no agglutination by Dreyer's method, and in neither of these was the titre high enough for diagnosis. These observations suggest that negative cases may occasionally give positive results, but this is not of much import. The fact that every clinical typhus case which was proved positive by the Weil-Felix reaction was spotted by the slide method is justification enough for urging the use of this simple technique as a preliminary to putting up a long series of tests by Dreyer's or Felix's method.

It was decided to try out a number of slide-negative cases by Dreyer's method, to see whether the zone phenomenon or some other factor would produce positive results in slide-negative cases. Thirty-three such sera were tested; the highest dilution put up was 1 in 250 and the lowest 1 in 25. Of these, 25 were completely negative; the remaining 8 gave agglutinations as shown in Table IV.

TABLE IV

Serial No.:	25	27	29	33	35	45	50	51
OX 2 ..	0	25	0	50	25	25	0	25
OX 19 ..	25	0	25	0	25	0	25	0

None of these titres has any diagnostic value.

It is reasonable to conclude from these results that a negative blood will not give a positive Dreyer test, certainly not of any diagnostic value. The low titres given in Table IV have no significance beyond perhaps the possibility that the individuals had developed some immunity as a result of subclinical infection, or had suffered from the disease some time previously.

### Comment

Having established that all positive cases can be detected by the slide method (of course to be confirmed by a complete agglutination test), and that the slide-negative cases will give a positive result by Dreyer's method, it is a reasonable assumption that a complete Weil-Felix test need not be done unless the slide test is positive. If this procedure is followed, the obvious advantages will be: (a) economy in material time; (b) avoidance of unnecessary bleeding of the patient; (c) easier dispatch of slides, as compared with that of blood or serum, to a laboratory situated at a distance from the hospital. Probably the test could be done on thick smears of blood, similar to those used for the detection of malaria parasites, and taken at the same time.

### Summary

A dry blood test for typhus has been tried out among Egyptian civilians.

It has been shown that all typhus cases give a slide-positive result, though a slide-positive result does not necessarily mean a positive case.

Control tests show that a negative slide will not give a positive Weil-Felix reaction.

The need for trying out this method on a more extensive scale is urged, and the advantages to be derived therefrom are discussed.

We thank Mr. A. C. Lahiri for his help in recording our results and with the typescript.

### REFERENCE

Steuer, W. (1942). *Munch. med. Wschr.*, 89, 33. (Abstr. in *Bull. War Med.* vol. 11, No. 5, May, 1942.)

## Medical Memoranda

### Vaginal Ulceration and Vitamin C Deficiency

During the past six months several patients attending the gynaecological clinic at the Radcliffe Infirmary with acute ulceration of the vagina were given doses of 300 to 500 mg of ascorbic acid daily while investigations were proceeding to determine the aetiology of the ulceration. Healing occurred rapidly without further treatment. With this in mind it was decided in future to investigate the level of the blood ascorbic acid before starting treatment. The following cases are therefore of interest.

#### CASE I

A single woman aged 34, in apparently good health, complained of pain and discomfort on micturition and a continuous blood stained vaginal discharge for one month. There were two small areas of ulceration on the inner surfaces of the labia minora and an additional area on the vault of the vagina. They had a punched-out appearance of syphilitic ulcers and the acute tenderness of tuberculous ones. There was no surrounding induration, smears and cultures failed to reveal either treponema or gonococci, at the Wassermann reaction was negative. Biopsies showed no evidence of epithelioma and nothing suggestive of gonococcal, tuberculous or syphilitic infection. The urine was sterile and there was no glycosuria. Haemoglobin amounted to 98%, the red count was 4,900,000, and the leucocyte count 10,000. The blood ascorbic acid level was 0.04 mg./100 ml. The normal wartime level as found in a control series of apparently healthy persons was 0.4 mg./100 ml. (J. R. P. O'Brien—personal communication).

In view of these results the patient was questioned on her diet and it was found to be unusually lacking in green vegetables and fruit. The main meal of the day was taken in the canteen of a munition factory. Ascorbic acid mg. 150 t.d.s. was prescribed for three days, and mg. 100 t.d.s. for a further month. The ulceration had completely disappeared five days after starting treatment. The



seen no recurrence after six weeks. The blood ascorbic content rose to 0.84 mg./100 ml.

## CASE II

A healthy-looking married woman aged 38 complained of "acute in the front passage" a few days before menstruation and vere dysuria for four months. Owing to extreme pain and tenderness sexual intercourse for the previous four months had been impossible. On examination there was a condition of granulomatous ceration, involving the vaginal introitus, the suburethral angle, and the fourchette. There were also minute shallow ulcers within e vagina. Smears and cultures revealed no evidence of gonococcal treponema infection. The Wassermann reaction was negative. opsies showed benign non-specific ulceration. The blood picture is normal; the urine was sterile and sugar-free. The blood orbic content was 0.26 mg./100 ml. Ascorbic acid mg. 150 t.d.s. as prescribed for three days and mg. 100 t.d.s. for a further four eeks. All ulceration disappeared in six days and the blood ascorbic nent rose to 1.2 mg./100 ml. There has been no recurrence after e weeks.

These cases have reminded one of us (M. K. L.) of similar ginal conditions seen among West African natives and recog- zed as due to an avitaminosis. Varying degrees of avitaminosis produced varying degrees of vaginitis, ranging from a mild ritation with no pain to excoriation with painful ulceration. eatment with marmite, tomato juice, and citrus fruits was y successful.

The above cases were investigated and treated while under the care of J. A. Stallworthy, by whose kind permission we publish them. The orbic acid used was the preparation redoxon, supplied by Roche Products d.

M. K. LAYLOR, M.R.C.O.G.,

Obstetrical and Gynaecological Registrar

M. F. RICHARDSON, B.M., B.Ch.

Gynaecological House-surgeon

The Radcliffe Infirmary, Oxford

## Anaphylactic Shock after Posterior Pituitary Extract Injection

he following unusual and alarming reaction to pituitary ract seems to justify publication.

## CASE HISTORY

An unmarried woman aged 32 was under my care two years ago r menorrhagia lasting from eight to ten days at each period. She proved after treatment with progestoral tablets and calcium injections. In Oct., 1942, she had another menstrual haemorrhage: it as so severe that she was unable to carry out her work, and came me for immediate help. I injected intravenously 10% calcium Sandoz and a mixed injection of 1 c.cm. of posterior lobe ituitary extract (gladutinrin Richter) plus 1 c.cm. of neofemargin ransmularly. Within a few minutes she complained of severe ins in the head, a feeling of apprehension, and blurred vision. e had an attack of coughing, and said that she could not breathe. e that the tongue felt swollen. At this stage I could actually e the eyelids, nose, and lips swelling, and the skin of the body as covered by an erythema and was hot to the touch. She also mplaind of retrosternal pains. The pulse was irregular and ecelerated up to 140. There followed pains in the epigastrium and ter in the lower abdomen. At this stage the nose became blocked, e eyes were running, and vomiting began. During all this time e patient was unable to speak, although she was not unconscious; ave her 2 c.cm. of nikethamide (coramine) hypodermically. A w minutes after the injection her condition improved; the pulse ame steadier and the rate decreased to 120 and later to 100, but eycardia persisted until the following day. After the nikethamide ection large quantities of very frothy fluid were vomited and eathing became easier. All the symptoms began to clear up: the welling of the face was greatly improved, and the exanthema faded adually. Itching of the feet, swollen eyelids, and head pains mained throughout the following day. The patient was able to ome five hours after the onset. One week later a slight irritant sh appeared on the side of the injection.

A noteworthy fact in her past history is that she had urticaria ter, eating fish during childhood. The picture resembled, to a rtain extent, anaphylactic shock after serum injection.

## COMMENTARY

During 17 years' practice I have given several thousand injections of pituitary extract and ergotin, either alone or mixed, and have never seen a similar reaction; moreover, on discussing is with colleagues I have found no one else who has seen case like it. The question arises whether this reaction was ooked by the pituitary extract or by the neofemargin, which ntains ergometrine. Chassar Moir (1936) reported a few ses of unusual reaction to ergometrine, and considers the ossibility of a rare idiosyncrasy to that drug, but his cases owed a different appearance. Their faces were grey and overed with sweat; there was no sign of glottis or pharynx edema, no rash or itching. It seems to me that the case I ve described was due to the presence in the pituitary extract some traces of protein or to hypersensitivity to pituitary ract produced by some other unknown substance. The

picture of pituitary shock which sometimes occurs in patients is clinically characterized by pallor, increased pulse rate and fall of blood pressure, headache, and occasionally abdominal pains, nausea, and vomiting. These symptoms are due to capillary vasoconstriction and coronary spasms, and they differ from those I have described here.

I found very little explanation in the literature. Simon and Ryder (1936) reported five cases of hypersensitivity to pituitary extract in patients with a family or personal history of allergy, but all had been sensitized by previous pituitary injections, whereas my patient had never before had an injection of pituitary extract. These authors made skin tests with different extracts, and showed that the sensitivity is not limited to one particular brand of extract and is not due to vasopressor or oxytocic factors but to some constituent of the gland. Sullivan and Heffernan (1942) describe three different varieties of toxic reactions following the use of pituitary extract: (1) pituitary shock; (2) pituitary reaction resembling true anaphylactic shock; (3) more rare tetanic convulsions with either a rise or a fall in blood pressure.

Although conclusions cannot be drawn from one case, it seems advisable to avoid pituitary extract injections in cases with a history of allergy and to give only small doses if a patient has previously had the extract, until it is certain that there is no hypersensitivity.

London, W 1 E. SCHLEYER, M.D. Vienna, L.R.C.P. & S.E.D.

## REFERENCES

- Moir, J. Chassar (1936) *British Medical Journal*, 2, 1025.  
Simon, F. A., and Ryder, C. F. (1936) *J. Amer. med. Ass.*, 108, 512.  
Sullivan, C. L., and Heffernan, R. J. (1942) *Amer. J. Obstet. Gynec.*, 44, 675.

## A Case of Cavernous Sinus Thrombosis

The following case is of interest as an addition to the number of recorded recoveries.

## CASE HISTORY

A boy aged 14 struck the region of his left eyebrow on a door-handle. On account of soreness of the part he attended hospital two days later, but no abnormal signs were then evident except for a slight skin abrasion. The following day the eye began to become prominent and the temperature mounted to 103°, and on admission that evening there was gross left proptosis with chemosis as of an orbital cellulitis. The next evening the other eye became equally protruded, and the day after that the whole face was grossly engorged. By that time he was vomiting, was doubly incontinent, and had become semi-comatose. This state lasted a week, during which time the fever remained around 103°; then gradual recovery ensued, with decongestion of the face and a return to continence and consciousness. On the 5th to 8th days after admission there were attacks of tremors affecting all muscles of the face, and to a lesser extent the arm, on one or sometimes both sides; these lasted a few minutes and occurred several times a day. No fundus changes were evident except slight engorgement of the retinal veins and doubtful blurring of the optic disk margins, especially on the left side (the side first affected). On his return to consciousness a residual left facial palsy was observed, clearing in about a fortnight. There were also stiffness of the right leg with extensor plantar reflex, and left external rectus paresis, which disappeared in a few days. His convalescence was delayed by a mild basal pneumonia and a small subcutaneous orbital abscess. Vision was 6/5 right and left.

Treatment included administration of sulphapyridine, which could only be given intramuscularly after the second day, and later sulphadiazine by mouth—32 g. in the first week (1 g. 4-hourly for 2 days, then 6-hourly for 5 days) and 21 g. in the second week (1 g. 3-hourly). Four pints of glucose-saline 5% drip transfusions were necessary while he was incontinent, vomiting, and unable to take fluids by mouth.

## COMMENTARY

Cavernous sinus thrombosis has been regarded as a uniformly fatal disease: in 1936 a 100% mortality was recorded in a survey of literature by Grove. With the advent of the sulphonamides, however, some 12 cures have been effected. In at least 3 cases, in conjunction with sulphathiazole, heparin has been used with success for the prevention of any extension of the clotting; in addition staphylococcal antitoxin is recommended even where (as in this case) the blood culture is negative and no adjacent furuncles can be incriminated, since before the sulphathiazole takes effect there is a lag period in which the antitoxic agent is of great value.

In this case the infection presumably reached the orbit from a nasal sinus through a fracture of the intervening bone, although this could not be shown subsequently on an x-ray film. The meningeal irritation producing localized tremors, and the residual palsies, are a frequent accompaniment, and confirm the diagnosis. Retinal changes have rarely been severe in those cases which have recovered.

I am indebted to Mr. P. G. Doyne and Dr. S. P. Meadows for permission to record this case.

P. D. TRÉVOR-ROPER, M.B., D.O.M.S.,

Capt., N.Z.M.C.

Late Resident Surgical Officer, Moorfields Eye Hospital.

## Reviews

### HUMAN BIOLOGY: THE PECKHAM EXPERIMENT

*The Peckham Experiment: A Study of the Living Structure of Society.* By Innes H. Pearse, M.D., and Lucy H. Crocker, B.Sc. (Pp. 333. 12s. 6d. net.) London: George Allen and Unwin, Ltd. 1943.

The Pioneer Health Centre at Peckham took shape in 1926, when a small house was occupied in South London with a view to offering to the families of the neighbourhood a health service built up on the pattern of a family club, with a periodical health overhaul for all its members, and with various services for infants, children, and parents alike. In 1935 it entered into possession of a modern building, specially constructed and equipped as a "laboratory for the study of human biology." The amenities of the Centre were intended for families within walking distance, so that it was a local enterprise, but with the literature which it is accumulating Peckham may well come to stand not for a suburban habitation but for an idea, and a very fertile one at that. *The Peckham Experiment*, the writing of which has been made possible by a grant from the Halley Stewart Trust, is the third of four books on the subject. The first two—*The Case for Action* and *Biologists in Search of Material*—appeared in 1931 and 1938, and the fourth, to be entitled *Science, Sanity, and Synthesis*, is to follow. The present work, by two women. Dr. Innes Pearse and Miss Lucy Crocker, both of whom have had social experience in the East End of London, is not a description of the Peckham Centre, with some general conclusions to be drawn from its work; rather it is an essay on human biology with illustrations derived from Peckham. It deals wisely and penetratingly with the subject of the family, which is the unit of the Centre's operations, and it discusses the phenomena of courtship and mating, the bringing up of children, and social poverty and sufficiency in a way which is scientific and original, but never losing sight of the human subject in the mass of biological material. Perhaps that is because the authors are not writing out of the void, as it were, but on the solid basis of the work at the Centre, with its manifold activities and its human interest.

Falling in love is a theme which has suffered alike at the hands of romancers and cynics; but these trained biologists manage to deal with it understandingly and sympathetically. The growing pains of adolescence can hardly ever have been better described than in Chapter XI. Another fundamental idea of the Centre, which is reflected in these pages, is the importance of the father, that neglected shadowy figure in all maternity and child welfare organization. The Centre introduces him into the parental consultations; his presence there is made to appear a matter of easy and natural routine, so that instead of being a shy and anxious spectator of his wife's pregnancy his attitude is likely to become one of intelligent interest and active partnership, without any sneaking regret for what has happened or any dread of what lies ahead. Peckham affirms that pregnancy is a condition in which Nature has destined woman to be at her best, that there is no basis for the relegation of the pregnant woman to the position of "patient" to which modern civilization has condemned her, but it adds that in all parenthood from its very beginning the role of the father as well as of the mother as a specialist in the nurture of their child is of the utmost importance to the family as a functional unity. Peckham deserved a book, but this volume deserves a multiplication of Peckhams.

### BRONCHIECTASIS

*Bronchiectasis: Pathogenesis, Pathology and Treatment.* By James R. Lisa M.D., and Milton B. Rosenblatt, B.S., M.D. Oxford Medical Publications. (Pp. 190; illustrated. 21s.) London: Oxford University Press. 1943.

This book, by two American authors, is badly conceived, being either too long or too short. It is written to review current ideas on the pathology and pathogenesis of bronchiectasis, describe the pathological findings in 110 cases studied by the authors, and elaborate their conclusions as to its cause. The book opens with a chapter on the anatomy of the bronchi, and includes others on the symptoms and treatment of bronchiectasis. These occupy one-third of the contents, and

could well have been either omitted or amplified. They contain little that is unfamiliar to the reader who will be interested by the main subject in the book, but are not comprehensive enough for a textbook on bronchiectasis.

The authors examined the lungs of all cases that came to necropsy at the City Hospital, Welfare Island, in 1939; the (110) showing evidence of bronchiectasis were cut serially at the sections were stained by various methods. A clear description of the findings, with many photomicrographs, is given. The authors found that a similar infective process existed whatever the associated condition of the lungs. They then describe the theory of the pathological sequence of events, and conclude that the disease is always basically due to an infective atelectasis and other suggested causes being either coincident with or adjuvant to infection. This theory is attractively argued, but the objections to it, though mentioned, are not completely met. A useful list of references to the authors quoted is given, but it is confined to workers in either Britain or America.

The book can be recommended to those who are interested in the pathogenesis of bronchiectasis as a valuable contribution to its study.

### BRITISH MEDICINE

*Medicine in Britain.* By Hugh Clegg, British Life and Thought, No. 46, illustrated. 1s.) Published for the British Council by Longmans Green and Co.

When Mr. Seward, fishing for an acknowledgment that John had himself written Dodd's *The Convict's Address to Unhappy Brethren*, said that it had more force of mind than any of Dodd's earlier works, the doctor sharply rejoined "Depend upon it, Sir, when a man knows he is to be hanged in a fortnight it concentrates his mind wonderfully." To require to tell in fifty pages the whole story of *Medicine in Britain* and to make clear to a foreigner the evolution and prospects of our heterogeneous system may not be so great a prospect as a journey to Tyburn, but could not be performed tolerably without great concentration of mind. Dr. Clegg has performed it admirably. In his historical sketch he makes individualism and resentment of central control so clear that a foreigner will not be puzzled by the existence in a small island of 24 licensing authorities—though he may still be perplexed by the social custom which requires a surgeon to eschew the prefix "Dr.," however ample his academic claim to the title.

In describing present conditions and aspirations Dr. Clegg cannot avoid controversial topics, and writes dispassionately without being dull. The following passage seems to be admirable: "In view of the intimate nature of the patient-doctor relationship, the medical profession believes that the patient must have the right to choose and to change his her doctor, and that the doctor may have the right to refuse to continue looking after a certain patient. In this, it is a freedom to change rather than to choose which is important. To a critical foreigner—conscious of the notes in others' ears—the battle-cry 'Free choice' seems an example of 'British hypocrisy.' Whoever, he may say, ever had or could have free choice of doctor; even Marcus Aurelius could not, or not, enforce his free choice of Galen? We know what we mean but the last sentence in the passage quoted is required by a foreigner. Whether there might not be freedom to choose under many systems is another story. Dr. Clegg is not a propagandist, and criticizes our system. Sometimes he is a little harsh. He writes: 'On the whole it cannot be said that the Ministry of Health has been as progressive as most progressive of the local health authorities—such, for example, as the Middlesex County Council and the London County Council. Its activities as a forward-looking health authority have suffered as a result of fluctuations in general policy—a disadvantage suffered by all centralized authorities subject to political influence and change. Nevertheless during the present war the Ministry of Health has taken a very much more active part in promoting the health of the people than it has done in the past.' Until the present war the Ministry of Health had not the power to be progressive in the way that a local authority could be progressive, precisely because it is not a local authority. We think nearly all foreigners and good many Englishmen could learn a great deal from this excellent booklet.

## DISORDERS OF THE MIND

*The Nature and Treatment of Mental Disorders.* By Dom Thomas Verner Moore, O.S.B., Ph.D., M.D. Foreword by Edward A. Strecker, M.D. (pp. 312, 54.00.) New York: Crane and Seratone, 1943.

This study comes from the Catholic University of America, and naturally shows signs of the special attitude of mind, both of psychiatrists and of patients, which is inseparable from the profession of the Roman Catholic religion. In the author's view mental disorder is essentially a psychological problem, and in his introductory chapters he is inclined to deny any relationship with the anatomy and physiology of the central nervous system, though later he refers to physiological changes in the hypothalamic area causing emotional expression and even changes of mood and suggests that such physiological changes may explain the intractability of much psychotic emotion. It is shown that Kraepelin's contention that definite clinical syndromes of mental disease may be described can be mathematically confirmed.

The author next considers the factors on which psychoses depend, and the theories of Freud, Jung, Adler, and Alexander are briefly described and examined. He then shows how emotional states can start and maintain organic changes through the autonomic system. He instances isolated emotional shocks apparently determining psychotic breakdown but considers that there is always a pre-existing disposition and points out that there is usually an interval of "brooding" between the emotional incident and the onset of the psychosis.

He considers that chronic emotional stresses may determine mental disorders, but does not believe that direct sexual factors such as celibacy, continence, or masturbation themselves contribute. He takes the "phobia" as a useful field of study. He points out that these are not always sexually determined. Child fears do not always develop into phobias, and may be dispensed by wise home handling. Even phobias may spontaneously disappear in fortunate circumstances, but examples are given in which phobias are retained because they are consciously or unconsciously useful to the patient.

Under the section on treatment the successful analytic treatment of a case is described, and the success of simple free association is recorded in another case. The author illustrates the usefulness of psychotherapy in psychosomatic diseases, and points out how religion (Catholicism) and simple talks may be of great service, quoting as examples cases of marital disharmony and the problems of the unwanted and over-protected child. He refers to the usefulness of play therapy, reorganization of the family and school relationship, drawing attention to emotional retardation as opposed to awkwardness. He thinks that "bibliotherapy"—the choice of appropriate books for the patient to read—may be of great use. He illustrates how the rapid elimination of hysterical symptoms in children by counter-suggestion may clear up the whole psychoneurotic situation. Since emotional states can be induced by physiological changes in the hypothalamus, he maintains that drug treatment may well be useful, and refers specially to convulsive therapy by insulin, metrazol, and electrical methods, to hyperpyrexia and the administration of adrenal cortex and pituitary hormones. There is an appendix on the classification and definition of the clinical entities of psychiatry.

This work is well illustrated by case records; but contains nothing very new or original, and the up-to-date British psychiatrist will find the book interesting reading but will probably conclude that he has heard it all before.

## Notes on Books

J. H. WOODGER's *Elementary Morphology and Physiology for Medical Students*, which he aptly describes as "a guide for the first year, and a stepping-stone to the second," has reached a third edition (Oxford University Press; 15s.). This issue is distinguished on its predecessors by a well-illustrated chapter entitled "A Digression on Insects." Taking the American cockroach (*Periplaneta americana*) as exemplifying the principal features of a typical insect, describes this one example in sufficient detail to enable a student grasp the essential features of the structure and function of the various parts and organs of the order Insecta as a whole, and also

to follow descriptions of those of medical importance, the more important of which are briefly noted at the end of the chapter. With full appreciation of the difficulties imposed by limitation of space in writing an elementary textbook, one would have liked to see greater stress laid upon the essential part played by response to environmental changes in both plants and animals, and to the undeniable evidences of the inheritance of modifications of structure and function which have been produced by climatic, parasitic, and other changes in environment causing either evolution or regression. In considering modern developments of the Mendelian theory, some of which rest upon assumption, there seems to be a tendency to place undue importance on the levelling influence of amphimixis on chance variations, while the causes concerned in the production of these variations are apt to be lost sight of. Bearing in mind the importance of a sound knowledge of heredity for the medical practitioner, we think that the value of the bibliography at the end of the book would be greatly increased if there were included in it—along with references to the standard works of Darwin, Wallace, and others—the names of a few special short works which give the essential points of the main theories in a small compass.

## Preparations and Appliances

## A PERITONEOSCOPE

Mr. GERALD OVENS, F.R.C.S., writes from St. Bernard's Hospital, Southall, Middlesex:

The value of peritoneoscopy as an additional method of diagnosis in obscure abdominal lesions is being increasingly recognized; but two factors—expense and the difficulties of obtaining a suitable instrument at the present time—have largely prevented its more widespread use in this country.

I am indebted to Mr. Schranz of the Genito-Urinary Manufacturing Company for designing for me a simpler and cheaper instrument which, while not intended to replace the Ruddock peritoneoscope, has in practice been found of great value in differential diagnosis and in assessing the operability of abdominal tumours.

The expense of all these endoscopic instruments lies chiefly in the optical portion. This peritoneoscope has been designed for use with the standard telescope supplied in H.M. Government cystoscopic sets, which thus becomes interchangeable, but it can readily be built to fit any telescope provided. It consists of: (1) A cannula with air inlet cock and trocar (Fig. 1). (2) A sheath similar to that of an examination cystoscope carrying a lamp at the distal end, and the usual connexion adjacent to the valve chamber (Fig. 2). (3) A standard 90° telescope (Fig. 3).

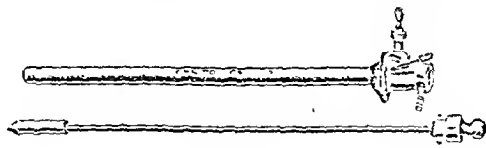


Fig. 1

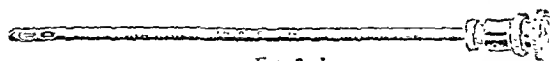


Fig. 2

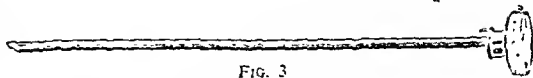


Fig. 3

The diameter of the sheath is slightly smaller than the lumen of the cannula, leaving sufficient space for the passage of air. It is held in position by means of an adapter which can be locked to the cannula.

In using the instrument a pneumoperitoneum is first induced under local or general anaesthesia by means of an ordinary artificial pneumothorax induction needle. The trocar and cannula are then inserted and the telescope removed. The adapter is locked to the cannula and the telescope and sheath inserted through it. A slight tightening of the locking device secures an air-tight joint. Bellows are now attached to the lateral connexion on the cannula, which is provided with a tap so that when sufficient air distension has been obtained the bellows may be discarded.

The instrument may be obtained from the Genito-Urinary Manufacturing Company, 284, Devonshire Street, W.1.

## TUBERCULOSIS IN WALES

The latest annual report of the King Edward VII Welsh National Memorial Association includes an address which its president, Lord Davies, delivered at the annual meeting.

Lord Davies referred in particular to the two important measures which have been taken in combating tuberculosis—namely, mass miniature radiography and the payment of maintenance allowances to dependants of persons suffering from pulmonary disease. Public opinion in Wales, he said, had been ready to welcome and utilize mass radiography for some time past. In 1941 the association approved an experimental scheme for the provision of mass radiography apparatus suitable for the conditions prevailing in Wales, including a vehicle for transporting it around the country. The initial cost of £5,500 was sanctioned by the Welsh Board of Health, but there had been some delay in securing the apparatus, and at the time he spoke its delivery in this country was still awaited. Meanwhile, the Ministry's set, although much less mobile than that which the association designed and ordered for itself, would be most useful in large centres of population in Wales. With regard to financial grants, Lord Davies drew attention to a leaflet (amplifying the model leaflet suggested by the Ministry) issued by the Flintshire County Council, pointing out that allowances were made under the Government scheme for pulmonary tuberculosis only, but that the county council provided additionally for all types of tuberculosis, and that the Government allowances would be operated as part of the county council's existing after-care scheme for pulmonary and non-pulmonary tuberculosis. He added that in Flintshire, out of 67 applications for assistance considered at a recent meeting of the Care Committee, 49 were found to be outside the Government proposals, thus showing the need for a fully effective care scheme in every area in Wales. Lord Davies referred to the National Memorial Association's plans for the future, temporarily postponed by reason of the war, which include the provision of additional beds at the tuberculosis hospitals, a new and enlarged research laboratory at Cardiff, modern clinics in all the large centres of population, an adequate and uniform health visiting service throughout the Principality, an extension of health education, and the establishment of a village settlement or settlements for the training of patients in suitable occupations. The treatment of chronic pulmonary disease as it affects coal-miners in Wales is at present under consideration.

## Reports of Societies

## HAND INJURIES

At a meeting of the Association of Industrial Medical Officers in January the chairman, Dr. J. C. BRIDGE, presiding, Mr. R. M. HANDFIELD-JONES and Dr. P. H. JAYES opened a discussion on injuries, infections, and burns of the hand.

Mr. HANDFIELD-JONES said that the commonest minor injuries affected the distal segment of the finger. As fibrous trabeculae divided the pulp of the finger into a series of narrow compartments, operation for drainage of a pulp infection, to be effective, must open all the infected compartments at once. A pure pulp infection must be differentiated from lymphangitis; in the latter incision was contraindicated, and each patient should be regarded as a potential fulminating case and be put to bed with the arm raised to 45 degrees, local antiphlogistine and early massive doses of sulphanilamide being given. Tendon-sheath infections were serious in that complete return of function could never be guaranteed. Early incision was essential. Infection of the palmar spaces caused swelling and tenderness of the palm. The swelling when the middle palmar space was involved was not so noticeable as the "ballooning" in the case of the infection of the thenar space. These infections were usually caused by spread from others, and were rarely direct. Patients with injuries of the hand, especially compound fractures, should be treated as in-patients. The wounds, having been cleaned, should be filled with sulphanilamide powder, loosely stitched, and subjected to some form of traction. Early active movements were essential. It was much easier to avoid a stiff joint than to loosen a joint which had been allowed to become stiff. Position in treatment was often important. The oedema could be minimized by raising the arm on a wooden frame; to have it lying on a pillow was not enough. If a stiff

joint appeared inevitable the hand should be kept in the proper position for function, as stiffness in an unsuitable position gave an unsightly and useless hand. By suitable splinting support and the intelligent use of elastic traction deformities and stiffness of joints might be avoided.

Dr. P. H. JAYES said that treatment of burns of the hands depended on the facilities available and on the nature of the case. As a general rule burns of first or second degree were not much trouble, and whatever treatment was adopted full function usually resulted. Third-degree burns of the hands raised many problems of treatment. Skin grafting was often necessary to attain a full functional result. Coagulants did not as a rule give the best results on account of constriction of the fingers and consequent interference with blood supply, caused not only by the coagulum but by the oedema so commonly present beneath it. The coagulum was often so stiff that it splinted the finger for many weeks; the stiffness was difficult to overcome at a later stage. The saline bath was used for all severe burn cases. Efforts were made to prepare denuded areas for skin grafting at an early stage. Dressings were soaked off in the bath and the parts were exercised by active movements at the same time. After drying, the burned area was powdered with sulphanilamide and covered with tulle gras, with a moist saline compress over it. Most cases were skin-grafted by the end of three weeks. It was important to be sure that the denuded area was free from haemolytic streptococci. If the swab was positive grafting was postponed and efforts made to sterilize the skin by the local use of sulphanilamide and propamidine. Dr. Jayes stressed the importance of keeping the hand moving while waiting for grafting. If joints had been opened and stiffness seemed almost inevitable, the joint should be kept in the position of election for optimum function. Cases seen at a late stage with contractures due to tight scars could often be improved by dissecting away the scar and replacing it by Thiersch grafts. In some cases a full-thickness skin graft from the abdomen was necessary. First-aid treatment for burns should be as simple as possible, and in many cases covering with a sterilized dressing was sufficient. At hospital the area was carefully cleaned up under aseptic conditions; CTAB detergent solution was used for this. Blisters and loose skin were trimmed away, and the whole of the area was covered with sulphanilamide powder, tulle gras, and saline compress.

Dr. D. W. Winnicott recently addressed a meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health on the significance of psychology in infant welfare work. He stressed the mother's intuitive understanding of her child and her appreciation of the importance of the infant's feelings to the infant, the intensity of those feelings, and the reality of infant distress. He suggested that if many things which the ordinary good mother knew intuitively were accepted by doctors there would be no interference with any mother-infant relationship except where absolutely essential, and much unnecessary harm would be prevented.

The Colonial Office announces that a new campaign is to be launched in the South-West Pacific against the *anopheles* mosquito, which, if introduced to the British islands at present free from infection, could cause as many casualties as combat warfare. This scheme is to be financed under the Colonial Development and Welfare Act, 1940, and an initial grant of £65,000 to cover three years has been made for the purpose. The *anopheles*, and consequently malaria, have hitherto been unknown in the territories of Fiji, Tonga, the Cook Islands, the Loyalty Islands, New Caledonia, the Gilbert and Ellice Islands, and Samoa. In the islands to the west of Fiji, on the other hand, malaria is widely distributed. In peacetime, when there was little shipping traffic between the islands and air services were unknown, the danger of the spread of infection was small, and the routine malaria control was considered sufficient. But since the outbreak of war, the establishment of large garrisons and the increase of air and sea traffic between the islands have greatly increased the danger of introducing malaria to the "clean" islands. A start is to be made with entomological surveys near shores and ports, and reconnaissance surveys of all potential breeding-grounds. Normal antimosquito work will be intensified and danger-places will be cleared, drained, and oiled. At the same time an engineer will prepare a scheme for mosquito control on a long-term basis.

## BRITISH MEDICAL JOURNAL

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## DAYLIGHT AND DUST

It has been known since Kirstein's<sup>1</sup> extensive experiments in 1902 that certain pathogenic bacteria, particularly members of the respiratory group (for example, tubercle and diphtheria bacilli, streptococcus, and pneumococcus), may, after natural drying, remain alive for many days or weeks. However, Flugge's<sup>2</sup> earlier work showing the limited range of infective droplets expelled by consumptive patients during coughing and talking, together with the difficulty experienced in infecting guinea-pigs with dried tuberculous sputum, led to a general acceptance of the dictum that the spread of respiratory infections occurred predominantly by the spray or droplet method, which requires close contact between infective and susceptible persons. In recent years there has been a renewal of interest in the possibility of dust-borne infection, but, in spite of much laboratory evidence that the dust in scarlet fever, diphtheria, and ear-nose-and-throat wards may contain many millions of haemolytic streptococci or diphtheria bacilli, clinicians have been unwilling to believe that dried "emasculated" bacteria are capable of initiating infection. In actual fact Buchbinder and his colleagues<sup>3</sup> have shown that naturally dried streptococci do not suffer any loss of virulence or attenuation in any other of their activities. Absolute proof of the infectivity of dust is not easily obtainable, but there is now a considerable body of circumstantial evidence in support of this view. Thus White,<sup>4</sup> after sweeping out a cubicle vacated three days earlier by a puerperal patient infected with a particular serological type of haemolytic streptococcus, herself developed a tonsillitis due to a streptococcus of the same serological type. Cruickshank and Godber<sup>5</sup> showed in two small outbreaks of puerperal sepsis that the most likely reservoir of the infecting streptococcus was the air or dust of the wards, and that secondary streptococcal infection in a diphtheria ward was most probably dust-borne. On the assumption that infected dust is an important vehicle for the spread of respiratory infection, and perhaps also for hospital infection of open wounds, van den Ende and his co-workers<sup>6</sup> have devised methods for controlling the dissemination of dust in wards by oiling of floors and bed-linen, which prevents the dust being raised into the air during sweeping and bed-making. Treatment of floors with a strong antiseptic solution has been recommended by Crosbie and Wright<sup>7</sup> for the same purpose, and in our present issue Garrod brings forward

evidence that daylight may be of material value in reducing the risk of dust-borne infection.

The bactericidal action of the ultra-violet rays from sunlight or from special lamps is well known, and has lately been used in American hospitals and schools to control the spread of respiratory infections, and in surgical theatres to prevent skin sepsis after prolonged operations. Direct daylight, apart from sunlight, is also known to be bactericidal, but daylight diffusing through ordinary glass has usually been regarded as inert because of the removal of the ultra-violet rays. Some of the ultra-violet light does in fact penetrate ordinary glass, and American work has shown that this diffused daylight is bactericidal. Ultra-violet light, though powerfully bactericidal against moist bacteria, is much less active against dried bacteria, and is largely inactivated by the presence of gross particles of dust. In spite of this Garrod has found that the dust in first-floor wards which were receiving a fair amount of daylight yielded a much lower proportion of streptococcus-positive samples than the dust of ground-floor wards whose windows were bricked up. Similarly, 42 samples of dust on black-out screens adjacent to the windows failed to yield any haemolytic streptococci, whereas 56% of the floor-dust samples were positive. This is only circumstantial evidence of the bactericidal activity of daylight through glass, and no doubt other factors were operative—for example, ventilation and variations in the source, composition, and degree of pollution of the dust. More direct proof of the bactericidal activity of daylight was afforded when films of naturally dried streptococcal pus placed in glass-covered Petri dishes and exposed to daylight through glass were sterilized in 6 to 19 days, a south light being rather more active than a north light. Control films in a dark cupboard yielded viable streptococci up to 110 days.

These tests and experiments give some support to a widespread belief that black-out and ward-protective restrictions in hospitals have a deleterious effect on patients and contribute to the risks of cross-infection. Besides the beneficial effect of daylight, proper ventilation is a great enemy of respiratory cross-infection, and both of these are too often sadly lacking in hospital wards at the present time. Cross-infection ceases to be a bogey in the summer months, and it has usually been assumed that better ventilation is responsible; but the part which daylight itself may play needs to be further assessed. Even if the bactericidal rays are not particularly active against dried bacteria they may, by attacking sprayed droplets in their still moist form, help considerably in preventing the accumulation of grossly infected dust. Daylight in the country and small towns is likely to be more bactericidal than that in our large cities, where most of the ultra-violet light is filtered off: this may be another argument for the transfer of hospitals into the country. The note by Shooter and Wentworth, printed at page 247 this week, on the fly as a carrier of haemolytic streptococci suggests yet another vehicle for the spread of this ubiquitous organism. Their finding may have special significance for surgical units with warmer weather and the "second front" ahead. It also emphasizes the lack of fly-proof screening in most of our hospitals.

<sup>1</sup> *Z. Hyg. Infekt-Kr.*, 1902, 39, 123.

<sup>2</sup> *Ibid.*, 1897, 25, 179.

<sup>3</sup> *J. Bact.*, 1941, 42, 615, 631.

<sup>4</sup> *Lancet*, 1936, 1, 941.

<sup>5</sup> *Ibid.*, 1939, 1, 741.

<sup>6</sup> *Ibid.*, 1940, 2, 133; 1941, 2, 755.

<sup>7</sup> *Ibid.*, 1941, 1, 656.



## MONTE CASSINO—CRADLE OF WESTERN MEDICINE

Salerno is one of the very few places in the Roman Empire where lingered traces of the arts and sciences of antiquity. We commemorated it as the seat of the first medical school in our issue of Sept. 25 last, when it was occupied by the Allies. They have now reached Cassino, seventy miles from Salerno as the crow flies. The vast monastery on the mountain that overlooks the town has been a centre of learning from its very foundation. In the history of medicine it has a special place, for here the medical Dark Ages showed a spark of the new spirit. If Salerno connects the Dark Ages with the remote classical past, Monte Cassino represents the dawn of modern times.

The monastery is a huge mass of buildings which occupy the top of a conical hill. It contains a large cathedral church and a series of beautiful cloistered courts of various dates. The whole complex of buildings is connected to the little town of Cassino by a funicular railway crossing a gorge which takes the whole of a tiring day to traverse on foot. Of old it must have taken the best part of a week to reach the monastery from Salerno. The monastery was founded in 529 by St. Benedict of Nursia, who died there about 544. The monks still show his tomb and that of his sister St. Scolastica, together with an ancient wall and tower of comparable antiquity. Monte Cassino has had a varied and stormy history. In 580 it was sacked by the Lombards and was rebuilt in 720. It was nearly destroyed again by the Saracens in 884, and was again rebuilt about 950. It reached the height of its influence under its great abbot Desiderius, who became Pope Victor III in 1087. We need not pursue further the distinguished and eventful history of the great foundation. It is convenient, however, to recall that the Norman Conquest of South Italy and Sicily, which deeply affected Monte Cassino, was almost exactly contemporary with the Norman Conquest of England and took place during the abbottship of Desiderius. Monte Cassino is the acknowledged first centre

Western monasticism. The Benedictine Order has always been associated with the promotion of learning. In no part of its history did the reputation of the great house stand higher than at the time that we are considering.

In the eleventh century, the greatest period of Monte Cassino, the relations between the civilizations of East and West were the very reverse of those we now know. In our time we have seen Orientals accord to our civilization the sincerest form of flattery. Things were very different then. The West knew well that not only military might but also science and learning lay with Islam. Oriental efficiency in arms, in administration, in commerce, as well as in the sciences and arts, had been more than sufficiently proved. The impression that they made on their Western contemporaries is still enshrined in our language in such Semitic words as arsenal, admiral, tariff, algebra, almanac, theodolite, damask, and a hundred others. Not a few of these Semitic terms are medical. Among them, despite their Greek appearance, the medical reader may be sur-

prised to learn, are a number of anatomical terms such as the names of the basilic, cephalic, and saphenous veins, and, of course, the names of many drugs. The first to convey to the West the substance of knowledge on which Arabic influence was based was one Constantine. He was born about 1020, perhaps of Jewish parents. According to the common legend, he first saw the light at Carthage, but it is more probable that he was a native of Sicily. He acquired his medical knowledge in Jewish circles at Kairouan in Tunisia. This town, one of the last in Africa to be taken by the Allies, is one of the least modernized of Oriental cities. Constantine returned about 1072 to Sicily, then passing into Norman possession. There he came in contact with Robert Guiscard. In 1076 Salerno fell to the Normans and became the capital of a Norman principality under Robert. Constantine seems to have arrived at Salerno in his suite and to have acted as his secretary for Oriental languages. Having become a Christian, he retired about 1080 as a monk to Monte Cassino. There he spent his last years, translating Arabic medical works into Latin. He died in 1087. In the eleventh century the works of the ancient Greek physicians had long been lost in the West. Arabic translations of these existed, as did many works in Arabic based primarily upon them. The knowledge of these was, however, confined to those who could read that language; in other words, so far as the West was concerned, exclusively to Jews. The Arabic superstructure on Greek medicine had profoundly affected the whole outlook of the world of Islam. The advent of Latin translations of these Arabic works caused a similar stirring of the spirit in the West. Thus the writings of Constantine, being the very first of their kind, are of peculiar interest. They consist entirely of translations of Arabic-speaking physicians. Among them were several works of the centenarian, Isaac the Jew (855-955), the great physician of Kairouan. They include his work on fevers, the best of its kind for many centuries, another on diet, and a third on urines, as well as certain of his philosophical writings. There were also works of Isaac's pupil, another Jew of Kairouan, ibn al-Djezzar (924-1004), including his *Viaticum peregrinantis*, a very popular guide to travellers on the care of health. Very important was a version of an extensive work by the Persian Magian, Ali ibn Abbas (died 994), which, oddly enough, was also circulated in the name of Isaac. These works and others of the like kind provided a vocabulary of technical terms, the remains of which can still be traced in our medical nomenclature.

Despite the vicissitudes of the great monastery where Constantine rendered this first service to medicine there still remain in the library some fourteen hundred manuscripts of great antiquity. A considerable number of these are medical and of the time of Constantine himself. Some are of yet earlier centuries. There is also evidence, into which we cannot now enter, that some of Anglo-Saxon medical texts that are of the time of the Norman Conquest were prepared at Monte Cassino. On this account, as well as for their value as monuments of civilization, we rejoice to learn that these most precious documents were long ago removed to a place of safety.

## OESTROGENS AND THE OVARY

Fundamental discoveries in endocrinology were made at a time—about fifty years ago—when only crude glandular extracts were available for endocrine research. But many conclusions were reached on the basis of what seemed fitting rather than on actual observations. Such were Brown-Séquard's claims for the rejuvenating action of testicular extracts, and under the same heading must be placed scattered references to a stimulating action of ovarian extracts on the ovaries. With the discovery of the chemical nature of the ovarian hormones and the isolation of pure chemical products these claims were not substantiated. Recent evidence, however, suggests that oestrogens do in fact stimulate the ovary. An interesting series of papers on this question was published in 1942 by Bullough, who belongs to the school which believes that oogenesis proceeds in the ovary throughout life. Whether this is true or not does not detract from the value of his observations. Bullough first studied<sup>1</sup> the number and position of the mitoses in the germinal epithelium of the mouse ovary at the different stages of the oestrous cycle, using the colchicine technique to ensure that enough mitoses were available for comparative counts to be made. Colchicine causes the arrest of all mitotic divisions in the metaphase, which is easily seen microscopically. Thus in an animal killed 9 hours after an injection of colchicine all the mitoses that have occurred in this period will be incomplete and all may be counted. The average total number of mitoses in the germinal epithelium of each ovary he found to be 20 to 31 during the three days of dioestrus, rising to 81 during pro-oestrus, followed by an enormous increase during oestrus, a total of 1,210 mitoses being recorded as a post-ovulation peak, with a rapid fall to 100 mitoses during metoestrus. He then studied the distribution of the mitoses, and though there was some variation in their number in all positions the greater part of the increase found during post-ovulation oestrus was in those areas of the germinal epithelium adjacent to the developing corpora lutea (actually 997 of the total 1,210 were situated there). Bullough suggests that the increase in the number of the mitoses in this place is due to its being bathed in the oestrogen-rich follicular fluid extruded in ovulation. In support of this view was the fact that mice with fewer follicles than normal, or in which a smaller number of follicles ovulated, had fewer mitoses. Bullough then proceeded<sup>2</sup> to see whether this idea of the action of oestrogen on the mitoses of the ovarian cells could be supported elsewhere. To do this he divided the membrana granulosa and theca of the developing follicles into zones and counted the number of mitoses in each after an injection of colchicine. He found that the number of mitoses is greatest in those follicle cells nearest the oocyte and the antrum, and diminishes progressively towards the periphery of the follicle. In the developing corpus luteum mitoses are at first most frequent in the old granulosa cells nearest the extruded follicular fluid, but later they become common in the cells adjacent to the newly formed reservoir of tertiary follicular fluid. Lastly, he proved<sup>3</sup> that the effects attributed to the follicular fluid are due to the oestrogen it contains. Large doses of oestrone (25 µg. at twelve-hourly intervals in 1 to 5 injections) were injected intraperitoneally into dioestrous mice as near to the ovaries as possible. The mice were killed 12 hours after the last injection and 9 hours after an injection of colchicine. In all cases there was a stimulation of the mitoses in the germinal epithelium, a total of 1,818 being

counted in one ovary after 5 injections. The injections also reduced the normal rapid growth of the follicles, particularly of the larger ones.

Bullough concludes that oestrogen directly stimulates the ovarian cells. Theoretically the objection may be raised that since the mice had intact hypophyses a possible action on gonadotrophin secretion cannot be ruled out, though this does not seem likely in view of the time relations involved. Bullough himself regards the fact that the injections have to be given in the neighbourhood of the ovary as strong evidence of direct action, though many substances are absorbed more rapidly from intraperitoneal injections than from subcutaneous ones. However, these arguments are not really essential, since it has been shown by Williams<sup>4</sup> and by Pencharz<sup>5</sup> that the atrophy of the ovary which normally follows hypophysectomy can be prevented by the implantation of stilboestrol tablets, clearly showing that oestrogens can influence the ovary in the absence of the pituitary gland. The dose necessary to produce these effects is large, though Bullough's observations during the normal oestrous cycle suggest that the action is physiological. The full theoretical implications of the findings and their possible clinical applications remain to be studied.

## "BRITISH MEDICAL BULLETIN"

The first number of the second volume of this bulletin—on penicillin—starts the second year of its most successful career. The *B.M.B.* is published by the British Council and forms an important part of the activities of the Council's Medical Department, under the direction of Dr. N. Howard Jones, who is now a whole-time officer of the Council employed on this important task of informing medical men in other countries of the work that is being done by British doctors.

The *B.M.A.*, and more especially the *Journal*, has an interest in this undertaking and can take some pride in the successful way it has been carried out, for it was in 1940 that informal conversations were held between the Medical Research Council, the Ministry of Information, and the Editorial Department about supplying trustworthy information to foreign and friendly countries in order to create a basis of fact against which the foreign reader could judge misrepresentations made by the enemy. It was finally agreed that the war was proving a stimulus to a course of action that should have been entered into long before, and it was soon decided that the diffusion of medical knowledge from this country should be embarked upon as a long-term policy, and not as a short-term attempt to counter the absurd propaganda put out by the Germans. Dr. Howard Jones was appointed in August, 1940, to carry out this work in the Editorial Department of the *Journal* under the Editor's direction, and a scheme was prepared for sending to different parts of the world abstracts of important articles in current British medical journals, translated when possible into the language of the recipient country. Original articles by leading medical men on work in which British scientists had played a large part were also written, translated, and submitted for publication to foreign medical journals. Although some of the abstracts found their way to the bottom of the ocean, many were eventually printed in the foreign medical press, and medical editors and individual medical men abroad expressed their appreciation of the fact that at last this country was doing something to keep others informed of what was happening here in medical science. At the end of a year the basis of the British Medical Information

<sup>1</sup> *J. Endocrinol.*, 1942, 3, 141.

<sup>2</sup> *Ibid.*, p. 150.

<sup>3</sup> *Ibid.*, p. 235.

<sup>4</sup> *Nature*, 1940, 145, 388.

<sup>5</sup> *Science*, 1940, 91, 554.

Service, as it was then called, was firmly established, and at this point the British Council, which had been supporting the work from its beginning, suggested that they should now take it over completely as a permanent part of their activities, and in October, 1941, Dr. Howard Jones and his small staff left B.M.A. House for Hanover Street. The Council has recently begun to produce medical films, one of which, "Surgery in Chest Disease," is now familiar to many.

The *British Medical Bulletin*, the latest issue of which has suggested to us that we should put on permanent record the short history of the British Medical Information Service, developed out of the abstracting service and is fast becoming a real contribution to medical literature. It is published in English, Turkish, Portuguese, and Spanish. Recently the tendency has been to make each number a symposium, and the present one on penicillin provides a document which is almost indispensable to anyone who is working on this subject and who really wants to know the literature on it up to date. The symposium begins with six articles on various aspects of penicillin by Prof. L. P. Garrod, Prof. A. Fleming, Dr. E. Chain, Prof. H. W. Florey, and Dr. M. E. Florey. Then comes a review of selected papers in order of publication, beginning with 1929 and ending with 1943. A short appendix follows. The care and thoroughness with which this excellent symposium has been put together are a great credit to the compiler.

#### EUGENIC AND GENETIC ASPECTS OF THE Rh FACTOR

Many recent papers have added to our knowledge of the Rh factor and its responsibility for the great majority of cases of erythroblastosis foetalis. Haldane<sup>1</sup> has made an interesting contribution to this discussion, for he shows that important questions arise in the field of population genetics and of practical eugenics. Nine out of ten cases of erythroblastosis foetalis are due to the development in the blood of an Rh-negative mother carrying an Rh-positive foetus of immune bodies capable of agglutinating Rh-positive red cells. About 10% of all pregnancies among white American or British mothers are of this type, so at an additional factor, probably placental permeability, must also be involved. Haldane adopts the conservative estimate of a death rate from the condition of 1 in 200 conceptions, so that the abnormal permeability occurs in about 5% of cases. Using the above figures, he shows that the existing 14% or so of Rh-negative persons would be reduced to 1% in little more than 600 generations, or 15,000 years. This is a short time in the history of the human species, so that the existing population must be in a state of highly unstable equilibrium. Haldane discusses three hypotheses which could account for this strange state of affairs. The first is that recent environmental changes have led to a sharp increase in placental permeability: all the available evidence is against this possibility. The second is that the heterozygous state—that is, the possession of one Rh-positive gene and one Rh-negative gene—confers some counterbalancing advantage. This hypothesis is equally unlikely, for it would demand a favourable effect many times greater than the highest possible limit for the ordinary blood-group genes. The third hypothesis remains—that the present unstable proportions are due to recent racial mixture. Any human community would, left to itself, fairly rapidly become almost uniformly Rh-positive or, alternatively, Rh-negative, save for rare exceptions due to mutation. It is possible, therefore, that the European races have arisen in the not very distant past from the crossing of Rh-positive and Rh-negative races, and

are now undergoing a process of swift change. The study of Rh frequencies in different populations is thus likely to prove of high interest anthropologically. Haldane notes that it has already been discovered that only one out of a series of 120 North American Indians was Rh-negative. He points out more generally that variation in placental permeability and intense selection against heterozygotes may have been one of the mechanisms by which mammalian species have become distinct.

Haldane suggests that erythroblastosis foetalis provides a concrete test case for the advocate of negative eugenics—a case, moreover, which cannot be ignored, for this disease is certainly responsible for more deaths than are due to any other inherited condition. It is obviously futile to suggest that the 14% of Rh-negative women should not marry Rh-positive men—that is, that 86% of the male population should be barred to them. Nor could it be seriously suggested that the Rh-negative character ought to be eliminated by sterilization. If it should be found, however, that the abnormal placental permeability also depended upon a gene, he considers that there would be a strong case for dissuading women with the doubly unfavourable constitution (less than 1% of all women) from marrying Rh-positive men, and an arguable case for compulsion. But if the eugenic problem cannot be ignored it can, as Haldane goes on to show, be evaded. He suggests that the testing of pregnant women for the Rh factor, and if found negative, then further testing for the anti-Rh agglutinin, would give timely warning of the risk of erythroblastosis foetalis and facilitate prompt treatment by transfusion with appropriate blood. Actually this is no longer speculative. Since his paper was written Gimson<sup>2</sup> has described in this *Journal* a highly successful series of cases, and is able to conclude that, if an infant suffering from the condition lives long enough to reach hospital, there is a good chance of survival. In fact, up to now this is the finest example of an application of genetic research leading to the chance of timely recognition of a great danger and thus to prompt and successful treatment.

#### STANDARDIZATION OF NON-IONIZING RADIATIONS

The Medical Research Council has appointed the following as a committee to advise and assist it in promoting the quantitative study of the non-ionizing radiations, particularly in relation to their medical applications: Prof. H. Hartridge, M.D., F.R.S. (chairman); F. Bauwens, M.R.C.S.; R. B. Bourdillon, D.M.; E. Rock Carling, F.R.C.S.; Prof. J. A. Carroll, Ph.D.; J. Guild, F.Inst.P. (nominated by the Department of Scientific and Industrial Research); Prof. F. L. Hopwood, D.Sc.; and Prof. W. V. Mayneord, D.Sc. (secretary). In 1928 and 1937 satisfactory units for the measurement of ionizing radiations were agreed internationally, and there is urgent need of a corresponding standardization for the non-ionizing radiations. Under this heading will be included infra-red, visible, and short-wave wireless radiations, but it may be found advisable to deal also with ultra-violet and ultrasonic radiations, since none of these was covered by the earlier recommendations.

We regret to announce the death of Mrs. Frances Ivens-Knowles, M.S., F.R.C.O.G., late clinical lecturer in midwifery and gynaecology in the University of Liverpool, and during the last war surgeon-in-charge of the Scottish Women's Hospitals at Royaumont and Villers Cotterets.

<sup>1</sup> *Ann. Eugenics*, 1942, 1, 333.

<sup>2</sup> *British Medical Journal*, 1943, 2, 293.

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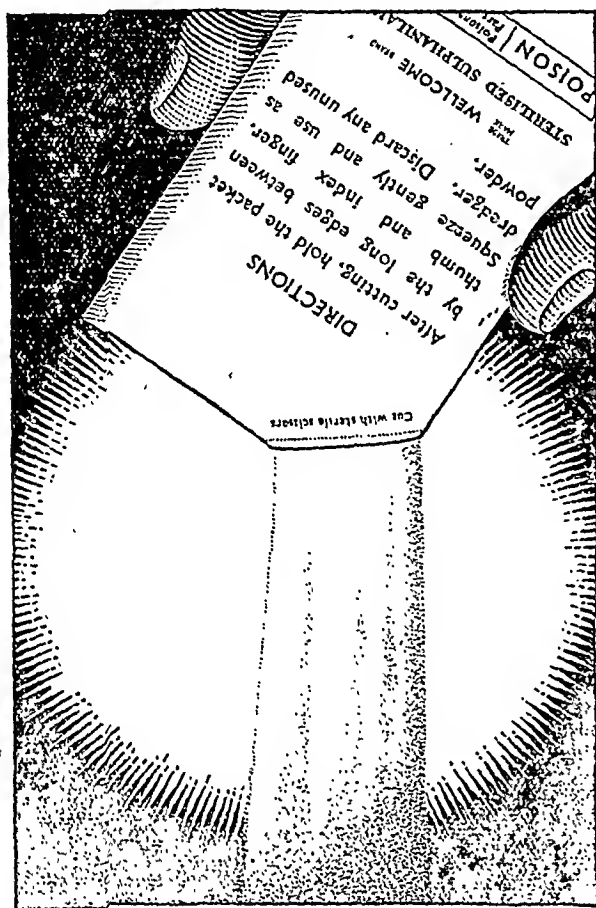
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## Correspondence

## FIRST AID 140 YEARS AGO

Though the term "first aid" was not invented in his time, yet Dr. William Buchan's *Domestic Medicine, A Dispensatory for the Use of Private Practitioners*, published in 1804, was really an early attempt to give the general public some systematized advice on how to deal with accidents and illnesses before the arrival of the doctor, though in some respects the book goes far beyond this. For his "private practitioner" was the layman pure and simple. It may be of interest to see what the person whom we should now call the first-aid-er was expected by our author to do.

## Some Drastic Measures

For one thing, he was expected to apply some heroic measures which will make the hair of the modern reader stand on end. An instance of this is the method recommended for the reduction of what Dr. Buchan calls "Dislocation of the Neck." He advises that the "unhappy person" should be laid on his back while the good Samaritan takes hold of his head with both hands, braces his knees against the patient's shoulders, and pulls the head "with considerable force" while "gently twisting it at the same time," if the face be turned to one side, until he perceives the joint to be replaced, which the operator will know "by the noise the bones make when going in." After this, the patient is to be bled and suffered to rest. We shall probably agree that the phrase "unhappy person" is not a whit too strong. On dislocation of the jaw he is sounder, giving a method very similar to our own. But he also mentions a drastic method used by the "peasants" which, he tells us, he has often known to succeed, though he does say the plan is "dangerous." It is. For the "peasant" puts a handkerchief under the patient's chin then turns his back on the dislocatee and pulls him up by the chin so as to suspend him from the ground.

Much of his advice on how to deal with "Substances stop'd between the Mouth and Stomach" is quite common sense, though we can hardly approve of his plan, "if fingers and nippers fail," of "bending a piece of pretty strong iron wire at one end," introducing it on the flat below the obstruction, and pulling it up. He advises, cautious man, that a piece of string be attached to this instrument in case of "ill accidents" such as slipping from the operator's hand. His method of artificial respiration, however, is quite passable if we remember that he wrote before the advent of Silvester, Schafer, and Eve. Dr. Eve, indeed, would quite approve of his insistence upon the necessity for restoring "the natural warmth" as a "principal intention." He himself favours immersion in a warm bath after or during the application of mechanical measures such as blowing by a "strong person" into the patient's mouth with the nostrils stopped, and pressing the "breast and belly" so assist expiration. But other measures he mentions to restore the natural warmth are somewhat drastic. One he quotes with approval is to lay the body on hot ashes, cover with ashes equally hot, put a bonnet on the head, and wrap a stocking filled with hot ashes round the neck. He does not altogether disapprove even of the method which, he says, is used in some parts of the countryside—viz., to make use of the warmth of a dunghill.

## Immediate Treatment of Wounds

Dr. Buchan's general directions for the immediate treatment of wounds are very sensible considering that he wrote before asepsis and antiseptics had been thought of. He ridicules the implicit faith placed in "certain herbs, ointments, and plasters as possessed of wonderful healing powers," insists that Nature does the cure, and explains that external applications assist only by keeping the parts "clean, soft, and defending them from the external air." For this purpose he recommends clean, dry lint as a first dressing. He is not so sound, however, in resorting at once to the tourniquet when there is haemorrhage, nor does he give proper warning as to the dangers incurred by improper use. He, of course, knows nothing of "pressure points"; indeed, he does not even so much as mention any form of digital pressure.

His advice on the treatment of fractures is more applicable to the professed surgeon of his day than to the "private practitioner." He does, however, give a much-needed caution as to the danger of tight bandages. On the general application of bandages to various parts of the body, however, he gives no directions, being of the opinion that any person of good parts will be able by native genius to apply them correctly!

Space has only allowed me to pick out some of the high spots in this curious treatise. In justice to the author, it must be owned that he is, on the whole, not unsound according to his lights. It is therefore all the more surprising when we come upon passages like some cited above and like the one in which he gives his sanction to the employment of fresh cow-dung poultices in the immediate treatment of bruises.

E. W. A.

## Publication of Anaesthetic Misadventures

SIR.—May I seek the courtesy of your columns to make an urgent request to all anaesthetists to publish a record of deaths and untoward incidents occurring under any form of anaesthesia and analgesia. Two deaths under local analgesia have been briefly recorded during the last five weeks in the *Evening Standard*, and it is a matter for regret that these deaths were not fully reported in the medical journals, as local analgesia has been generally regarded as very safe.

Anaesthetic mortality and morbidity in this country is far too high, and it does not at present seem that a noticeable drift away from inhalation anaesthesia and the adoption of other methods are leading to improved results; rather the reverse. Newly qualified practitioners often appear to have a very imperfect understanding of the relative safety of various anaesthetic techniques, and this unhappy ignorance may be the cause of avoidable deaths.

Under an entirely erroneous impression that ether leads to chest complications some anaesthetists are adopting the use of new and somewhat dangerous drugs, the physiology of which is as yet imperfectly understood. A false sense of security will arise and "modern anaesthesia" will become (if it has not already done so) far more dangerous than chloroform anaesthesia at its worst, unless practitioners are prepared to publish the complete records of all misadventures experienced during the experimental stage. Let it be remembered that many modern anaesthetic methods have not yet passed the experimental stage and we need much more information. The Association of Anaesthetists could materially assist by organizing a large-scale investigation as to the relative danger or safety of all anaesthetic drugs and the manner of using them.

There is at present a strong tendency to gamble safety for comfort, and this tendency is strengthened by ignorance caused by a very natural reluctance to publish our misadventures and a readiness to publish records of a series of our cases successfully anaesthetized by some new technique; thus a too optimistic picture of the real position is given. The investigation into analgesia in labour published by the Royal College of Obstetricians and Gynaecologists in 1936 showed how misleading individual experiences can be, and that a series of two or three thousand cases really shows us very little. Flagg, too, in his *Art of Anaesthesia*, stresses how inadequate is the experience of any one individual, however great that may be, to form a basis for a true statistical estimate for the guidance of others. We must take a wide view, and we can only come to a right judgment by co-operation and complete frankness. The American journals set us a very good example in this respect. Nothing can be gained by silence, and the general public, too, might then begin to understand their foolishness in not paying more attention to the importance of the art and science of anaesthesia. It is utterly lamentable that a surgeon should tell us in 1944 that in a county hospital "the anaesthetics are given by house-surgeons, many of whom have no previous experience" (O'Connor, *British Medical Journal*, Feb. 5, p. 199).

—I am, etc.

JOHN ELAM.

New Barnet.

## Chloroform Anaesthesia

SIR.—Recent letters in the *Journal* on the teaching of anaesthetics have drawn attention to the need for some improvement. I should like to see a crusade against the use of chloroform. Most authorities concede that the use of chloroform might possibly be justified in certain circumstances in the hands of an expert. Instead of this we find that the expert has abandoned chloroform altogether, and the only people using it, or mixtures containing it, are the inexpert, such as the resident, giving anaesthetics in the absence of the resident anaesthetist, or the overworked G.P. If there were better teaching of anaesthetics these people would understand the risks they run in using such a dangerous and toxic drug.

Almost at once after the induction of chloroform anaesthesia there is a fall in blood pressure. This fall is caused by heart failure

alone, and the heart may even fail before respiration. (This never happens with any other anaesthetic agent.) Levi was one of the first men to draw attention to the dangers of ventricular fibrillation under *light* chloroform anaesthesia, and to point out that the *deeper* the degree of anaesthesia the greater the chances of recovery. Blalock in 1928 recorded that the cardiac output in a series of eight dogs under ether increased an average of 20%, whereas with chloroform the cardiac output was decreased an average of 30%. Two hours of chloroform anaesthesia have been proved to be followed by liver changes which take 6 weeks to return to normal. Those who ridicule the dangers of chloroform do so chiefly from ignorance of these proved physiological facts.

Chloroform certainly has no place in the hospital; it may possibly be of use where no other anaesthetic is available—for example, in a ship at sea. Boyle's apparatus with chloroform and ether in series is potentially a danger. The chloroform bottle might now be discarded, and even were it needed, why is it not placed after the ether instead of before it? Were this so, at least we should only get chloroform polluted by ether, and not be found giving fifty-fifty chloroform-ether with only the ether tap turned on. Where there is risk of explosion there are now many agents we may use without having to resort to chloroform, such as intravenous pentothal or evipan, perhaps supported with gas-and-oxygen; gas-and-oxygen alone or supported by trileuc; in thoracic surgery, unilateral spinal; and for, say, exploratory laparotomy light percaïne spinal.

It will probably be a considerable time before all anaesthetics are administered by experts, but at least we should demand that all who are called upon to give them should have a reasonable knowledge of their dangers.—I am, etc.,

H. PARRY PRICE.

### Blood-pressure Readings in General Surgery

SIR,—May I reply to those who commented on the article on this subject (Dec. 25, p. 811).

To Mr. J. Hosford (Jan. 8, p. 59) I would say that blood-pressure readings can be done in all hospitals and should be taken in teaching hospitals where student help is available. Surgeons who have enjoyed the assistance and the instruction that these regular pressure records give must articulate their value so clearly and convincingly that they ultimately become as routine at operations as counting swabs.

With regard to deaths on the table, may I repeat that when blood pressures are taken during operation patients never reach the stage of death, actual or impending, without the entire surgical team being warned for some time previous, and their united efforts are directed to resuscitation. When such a crisis occurs, the instruction of the readings assists in the selection of the remedy and its correct dosage, for too little or too much may be given. Our pressure observations enable us to say that certain drugs given in a certain way will in a certain time act in a certain amount for a certain period; these include ephedrine, pholedrine, methedrine, cardiazol, coramine, and paradrine among others. So valuable are blood-pressure readings that a recorder of them at major operations is arranged for in the same way as the anaesthetist.

I assure Drs. Fearnley, Langton Hewer, and Morgan Jones (Jan. 15) that besides the blood pressure the other factors they mention are considered, but the short article omitted to state this; it attempted to evaluate the blood pressure for surgeons.

I am aware of the danger of a failing left heart; for instance, I find it difficult to diagnose clinically between it and an early carcinoma of the stomach. Likewise I have seen a patient recovering from a coronary infarct with a blood pressure of 130/90 superficially by the cardiac index alone a good surgical risk, yet the output of that heart was irregularly irregular (negating operation) and the history told of a prethrombotic pressure of 220.

The variation in blood pressure from observer to observer and from time to time was noted in the article, but the cardiac index as a rule is approximately constant, and the improvement from rest in bed and other remedies, estimated by my house-surgeons, blood-pressure reader, and myself, has been confirmed. The stimulants are given by the mouth—usually coramine, cardiazol, or strychnine (a general rather than a cardiac tonic)—and for the irregularly irregular rhythms digitalis, although auricular fibrillation is comparatively rare in surgical practice.

Patients needing operation are not denied them because of the cardiac index, but they may be prepared for several weeks

until they are deemed fit enough, and salutary experience confirms its necessity. Catastrophes in the cardiovascular system occur often enough to require its critical evaluation, and I repeat that the blood pressure intelligently taken will reveal significant information and with the cardiac index will be found a guide in the general run of operation patients.

With regard to the high pre-operative intake of fluid, experience shows that patients need it before a major operation. I know that in the treatment of heart disease fluids are limited deliberately, but when the cardiac lesion is as gross as this, preparation for operation is the physician's responsibility, and operation at this time is usually out of the question.

I like Dr. Langton Hewer's expression of the anaesthetist's problem, "not 'Can this patient survive my anaesthetic?' but 'Can I improve his general condition sufficiently to enable him to withstand the surgical trauma, and to live long enough to benefit by the effects of the operation?'" It is a charter for the physician-anaesthetist and the surgeon too!—I am, etc.,

London, W.1.

HAROLD DODD.

### Obstetric "Shock"

SIR.—The condition of obstetric shock requires the clearest definition, and I should like to elaborate Dr. Alders's admirable letter (Feb. 5, p. 197). The shock following obstetric mishandling is clearly surgical shock and has no place in this discussion. Its incidence should diminish when the three great causes of obstetric intervention—expediency, fear, and clamorous relatives—are given their correct place in our judgment.

The second, more nearly related, shock is that caused by pituitrin. The incidence of this too will, I hope, decrease when pituitrin is no longer given as a routine, a procedure which can be justified neither by reason nor by necessity. The shock it produces is sometimes thought to be a protein reaction, but I believe the mechanism to be the same as that causing true obstetric shock—the sudden release of a shock-producing substance (histamine, if you will) from the damaged muscle fibres in the uterus. These fibres have already shortened to the minimum physiological length, a process unique in duration and degree. Moreover, they are required to "hold" this shortening. The resulting relative anaemia does not allow the waste products of this immense effort to escape; the subsequent relaxation of the uterus is, I believe, concerned solely to allow these products free exit. It is therefore the worst possible obstetric practice to over-exert these gasping fibres with pituitrin, or to damage them with the manual *csuminess* of Credé's expression, a procedure again too often dictated by expediency or fear. Although true obstetric shock is so seldom seen, the tolerance of the uterus is no excuse for insulting it.

Blood transfusion, though empiric in reason, is admirable in treatment. When, however, we replace in our minds the fear of the third stage of labour, from which all of us have suffered or do suffer, with the quietness and confidence of uterine understanding, the necessity for such treatment will be minimized.—I am, etc.,

London, W.1.

MORTIMER REDDINGTON.

### Rehabilitation: A Warning

SIR.—This letter is not designed to be destructive. For three years now I have had the opportunity of following up, in most cases by weekly interview, those injured at the factories of a group of 8,000 workers. In many of these cases I have seen the place at which the injury occurred and know how the accident happened. In some cases I know, or at any rate try to find out, why it happened. In all cases I have tried to get some idea of the make-up of the injured workman and how he lives.

It is clearly right on moral grounds that every injured workman should receive the most skilful treatment and be returned to work with as little disability as possible. To this end it is clear that the support of industry and companies carrying the risks of workmen's compensation should be given to hospitals which aim at providing the highest standard of surgical care. From observations made on 1,000 workers admitted to compensation I would plead that it is necessary to move slowly in estimating the value of rehabilitation. Is not the word becoming almost mystical? One cannot but be amazed

the initiative of many injured in overcoming any disability, even when the architecture of first treatment has been faulty, is the surgeon made sufficient study of those who have apted themselves to their disabilities? It is doubtful. The first essential is first-class first treatment. The number of those who will benefit by an elaborate machinery of habilitation is not as large as some think. True, for patients with major injuries and those with a necessarily long absence from work rehabilitation is absolutely essential. It is the care of this type of case which has attracted public attention, and rightly so. Rehabilitation without the insurance of a planned turn to work is a mockery and can do grievous psychological damage. But among patients suffering from less major injuries believe there are a number who will show through rehabilitation an unnecessary delay in returning to work. They are those who, with the utmost care of the staff of the rehabilitation centre, will surely become over-interested in themselves and tend to fix their minds on the injured part. Many patients are harmed by the unguarded advice of those who treat them, alighting in the series of cases I have seen is almost consistent. If, as I contend, there is a delay through rehabilitation the return to work of those with less major injuries, then is a serious matter. Full function must be our aim whatever the cost, but the cost must be reasonable. A man's own initiative is still the best second to first-class surgical care. The extra weeks on all these non-major injuries would mount a cost beyond a reasonable figure, and if the State takes over the workmen's accident insurance it must operate without extravagance.

This letter is but a warning that rehabilitation may so easily be overdone, and such a useful advance lead to some abuse cannot much rehabilitation be done in the factory, much of it on the workers' original work?—I am, etc.,

W. JEATFRESON LLOYD

Works Medical Officer

Guest, Keen and Nettlefolds Ltd.,  
Birmingham

### Doctor and Patient

SIR,—I am astounded that in your annotation on doctor and patient (Feb. 5, p. 189) you should see fit to state: "It is very wrong, therefore, for a private practitioner to attribute banal symptoms to industrial processes of which he knows nothing, to give long holidays for trivial maladies, or to declare a worker unfit for a particular job on eleemosynary rather than scientific grounds." These are so obviously the words of a writer who is quite ignorant of the medical situation in an industrial area that they call for correction. Quite apart from the specific lesion—such as industrial dermatitis or silicosis—which is caused by industry, the whole industrial set-up imposes upon the individual a discipline and a compulsion which, in the case of the rebel and the emotionally unstable, often become unbearable. It is precisely when health is lowered that this strain is most acutely felt by the patient.

It is all very well to talk about science, but there is no science without public standards, and there are no public standards for this situation. Psychology is still looking for them. Eleemosynary is a word meaning charitable, commonly used by the uncharitable. The argument therefore is that the worker in the hour of his complaining requires science but not charity. Is this really editorial opinion? Surely what these patients need from their doctor is just plainly charity, and it is to the credit of general practitioners that they commonly get it.

If the industrial set-up did its job with more success, if it gave us a stable economy, if it contributed to the integrity and well-being of the family, if it made our cities beautiful and the insight of the common man more profound, then perhaps the doctor would be justified in inviting his patient's co-operation in these good and charitable works. But unhappily industry does none of these things, and its insight into the nature of human need is superficial in the extreme. Its development of human skill is subject to question. And the quality of the community life that goes on in the back streets of our industrial towns is something which I for one cannot contemplate with complacency.

The common working doctor does well if he stands by the common working man in good will and charity. Science cannot

yet provide him with infallible guidance in this territory. Every clinician recognizes that outside the realm of definite diagnostic labels there are many indefinite debilitated states that are little understood and subject to variegated labelling. The general practitioner knows perhaps better than the leader-writer the need for science. But his need is for a science which will give an account not only of the fragments of disease but also of the whole—of healthy persons in a healthy setting. Such a science will lay down the scientific as distinct from the moral standards of family and community life. To these it will be the duty of industry to conform. To invoke science as the only sanction for a label which will permit the worker to lay down for seven days the burden of his obligation to the Work State is by way of being rude to Science. It is to use a good thing ill.—I am, etc.,

Coventry.

K. E. BARLOW.

### Reform in Medical Education

SIR,—Dr. Walshe has framed a cogent indictment of the medical curriculum as it stands and of the proposals to amend it by additions. Many hearts must sink at the thought of the poor patient camel of a student kneeling to receive his eighty lectures of psychologists' psychology to top his present burden, and many must marvel at the naivety which can expect him to become thereby a more "insightful" and less materialistic practitioner.

But Dr. Walshe does not, as I think, carry his argument to its logical conclusion. He points out that the curriculum fails to teach clear and logical thinking and the right use of words; that it encourages credulity and breeds practitioners and even teachers who "fail to distinguish between thoughts, words, and things," and who are unable to speculate fruitfully on the theoretical basis of medicine; but he seems to imply that these qualities of mind could be cultivated within the framework of a curriculum, pruned and revised indeed, but still a technical medical course of teaching. Surely the really disastrous consequence of the curriculum's unwieldy bulk and weight is that it has sunk into and destroyed its own foundations. The place and time to learn the right use of words in thought, speech, and writing, to acquire the habit of speculation and the beginnings of wisdom and understanding of the human mind, is at school in the sixth form—or its equivalent—between the ages of 16 and 18.

These acquisitions are a natural and almost inevitable accompaniment and consequence of the intelligent study of a foreign language—ancient or modern—with its literature, of our own literature, or of history. They are not a natural or inevitable accompaniment of the study of elementary chemistry, physics, and biology. If we want to have in our profession clear-headed thoughtful doctors able to express themselves lucidly and concisely, with a flair for truth and a contempt for muddled thinking, we must at least allow the intending medical student, to become a scholar if he has it in him. If we wish the doctor to understand men's minds we must at least allow him to read the thoughts they have expressed and to learn of their behaviour as recorded by historians, dramatists, poets, and the greater novelists. If we wish the doctor to think we must encourage and even compel the student to arrange and express his thoughts. At present it becomes harder every year for a boy who, at 16, rashly declares his intention to become a doctor not to abandon all hope of becoming also a well-educated man.

Is it not abundantly clear that to attempt reform of the curriculum by additions, however desirable in themselves, is a disastrous policy if the end in view is to produce a generation of doctors worthy of medicine and of their country? Subtractions, even by themselves, would be better. But subtractions, of course, will not serve. The only way with the curriculum, if our intentions are serious, is to "shatter it to bits and then remould it nearer to our heart's desire," and the remoulding must begin with the examinations which govern it. When at least one question in every paper begins with the word "discuss" and means what it says, and when one paper in each examination is an essay paper, carries high marks, and is judged on form as well as content, we shall be getting on.—I am, etc.,

London, N.W.3.

LINDSEY W. BATTEN.

### Research in Ophthalmology

SIR.—The letter on research in ophthalmology from the president of the Association of British Ophthalmologists (Jan. 29, p. 158) is one which I hope will commend itself to most ophthalmologists. I have heard no contradiction of the view frequently expressed by me and by others that research in ophthalmology, with the closely allied activity of "prevention of blindness," while being of high quality, has not in the past been attacked with a vigour comparable with its great importance. The humanitarian and financial responsibilities resulting from blindness are of a considerable magnitude.

These basic considerations have been debated in the Prevention of Blindness Committee of the National Institute for the Blind for the past five years, and the committee reached a decision that the most effective way of reducing the incidence of blindness, now that surgical technique has attained such a high standard of efficiency, would be to institute independent but co-ordinated centres of research in certain universities and Royal Colleges. Two such centres have already been established—one in the University of Oxford and another jointly by the Royal College of Surgeons and the Royal Eye Hospital, London. Provision for further extensions of this important aspect of prevention of blindness is at present under consideration. As soon as this provision is authorized the junior members of hospital clinical staffs should be informed that for selected workers research in ophthalmology will offer a congenial career, comparable with other methods of the practice of their profession. Young clinical assistants with a flair for research will no longer feel that they are entering a backwater, and that their families will be financially penalized if they pursue research work for which they are specially suitable and for which they are willing to be trained.

I do not agree with Mr. Green, however, when he details as an alternative to this policy the creation of a Faculty or College of Ophthalmology. Such an advancement in ophthalmic organization is desirable and would be complementary and supplementary to the extension of facilities for research in teaching institutions, but it could never adequately replace such facilities. Successful research in ophthalmology implies the closest association with the basic sciences and with abundant clinical material.

I feel that no useful purpose can be served by attributing the neglect of research in ophthalmology in the past to any particular persons or group of persons. Rather should we recognize the great need for organized extension of facilities and concentrate on the best methods of making provision for such extensions. That certain universities and the Royal Colleges are suitably organized for carrying out such research under the most favourable conditions will, I hope, be agreed, and must be the method of choice in any comprehensive policy for the evolution of research in ophthalmology in the future.

Provision is also being made for the individual research worker, whose bona fides is established, through a minor research fund.—I am, etc.,

C. G. KAY SHARP.

Chairman, Prevention of Blindness Committee,  
National Institute for the Blind.

Leeds

### Actinomyces of Liver

SIR.—Mr. Hubert Chitty (Jan. 22, p. 115) reports the recovery of a case of actinomycosis of the liver. It would be interesting to know what treatment, if any, this patient received after his operation in Feb., 1929: whether the patient recovered as the result of the development of some immunity reaction or following the administration of iodine in some form or other.

There is an apparent contrariness in the results of treatment with iodine, whether given as iodide of potassium or tincture of iodine, some cases progressing to complete cure, others showing no improvement. This contrariness depends, so I believe, on whether there is or is not a secondary infection with pyogenic bacteria.

I have seen only five cases: the first, one of the lung with extensive cavitation and heavy secondary infection approaching the terminal stage. In the second, an abscess of the appendix with secondary abscesses, there was a secondary infection with *B. coli* not only in the primary but in all secondary abscesses,

which, when aspirated, gave a heavy growth of *B. coli* and showed typical actinomycosis granules; treatment with iodine was without effect; surgical treatment and packing with bipp resulted in death from nephritis due to bismuth poisoning. Nos. 3 and 4 were abdominal cases, operated upon, and reported by the pathologist as actinomycosis; there was no secondary infection, and both cases were cured by tinct. iodi (French Codex). No. 5 was an empyema. The surgeon remarked on the unusual hardness of the lung. Typical actinomycotic granules were present in the evacuated pus and in the sputum, but with no evidence of any secondary infection. Treatment with iodine in the form of tinct. iodi (French Codex) resulted in a cure, and the patient was still well and free from lung trouble 10 years later.

These cases seem to favour the theory that actinomycosis, like tuberculosis, is a much more serious affair when secondary infection has taken place. Recent reports on the cure of actinomycosis with sulphonamides suggest that it is in these cases where secondary infection has occurred that its chief advantage is likely to be reaped, especially if combined with iodine, and personally I like to give the iodine as tinct. iodi (French Codex), now known as the liquor iodi simplex.—I am, etc.,

West Malvern.

F. H. JACOB.

### Bone-marrow Transfusion

SIR.—Since the method is not yet in general use it seems worth while to second Mr. Hamilton Bailey's favourable testimony. By the intramedullary route I have given transfusions to forty infants under 1 year old, using the marrow of the tibia because the manubrium is not a good site in such small subjects. There was no difficulty at all, nor was any trace of sepsis encountered, though it was sedulously looked for in every case. The technique is utterly simple and the discomfort momentary. Any collapsed and dehydrated infant can have a transfusion under way within ten minutes of admission to the ward. Of course the clinical value of marrow transfusion is no greater than that of intravenous therapy by any other route: its virtue is purely technical. Still no one who has fumbled with a Bateman's cannula and a vein like a bit of chewed cotton, no one who has seen the last available venous channel firmly clotted up, no one hard pressed for time, once having tried this new method is likely to revert to the old. The only snag (barring over-enthusiasm engendered by facility) is the difficulty at the present time of getting needles sharpened.

One more point: some time ago in your "Any Questions?" column I saw mention of a serum needle for marrow transfusions. This is to be deprecated. Tocantins's needle, well and stoutly fashioned for its special purpose, is the weapon of choice.—I am, etc.,

The Grove Hospital, S.W.17.

J. B. ELLISON.

### Babies in a Glass Cage

SIR.—Some publicity recently has been given in a number of lay periodicals to the design and equipment of the new Children's Hospital, Birmingham. The public are told, journalistically, of our backwardness in baby welfare in this country, but that at least one step has been taken at Birmingham to put this right. Here "the idea behind is isolation." Ill babies are placed in glass cubicles isolated from friend and foe. They are suckled, if necessary, by a mother whose face has been obliterated by a mask and from a nipple whose attendant beloved breast is shrouded in a harsh, unlovely, but sterile gown. Bathing is conducted by a similar fantastic creature, but without even the beloved voice of mother to give a shred of comfort to the lost, ill, and hereft infant. After bathing (and feeding) the patient is placed in its cubicle of isolation behind whose refracting glass walls human figures appear and disappear with fantastic inconsequence, and through which the homely human sounds penetrate dully, a dim reminder as from a distance—a distance into which all the lovely, comforting, satisfying, and familiar things seem to have receded.

From this brave new world of deprivation, insecurity, soundlessness, and terrifying sights the infant victim is expected to draw fresh reserves with which to combat the invading micro-organism. How can it? Can the frustration of practically

very strong emotional need possibly cure an infant of anything? Do we, the medical profession, advocate a treatment which, I earnestly suggest, must be, for the patient, so much worse than the disease? Even if it is not, as it may be, ethal, what of the immediate misery and the ultimate consequences to mental health? Already we have with us the "evacuation problem," product of these same experiences of sudden deprivation, insecurity, and fear in older children. How much worse will be the effect on the still more sensitive 1-1-year-olds!

The general case for the control of sepsis in hospital practice—mainly surgical—is of course unanswerable, but that asepsis should be given an overwhelming emphasis in the treatment of infants is more than doubtful. With Bakwin's paper—reported in an annotation in the *Journal* of Sept. 19, 1942—offering unquestionable statistical evidence to the contrary, whatever case there was falls to the ground. Certainly submitting our frailest patients to such a fantastically severe regime should not be accepted without question as a self-evident triumph of science. It represents a failure on our part to find anything better than a barely humane and questionable remedy. To me at least, trying to see things from the patient's point of view, this latest "advance" of medical science appears as a disguised therapeutic retrogression of a most disturbing kind.—I am, etc.,

London, N.W.8.

H. C. SCOTT

### Babies in Hospital

SIR,—I am in complete agreement with Dr. Margaret Dunstan (Jan. 2, p. 131) in her opinion that under present conditions it is dangerous to admit infants into hospital. It is not uncommon to see an infant who has been admitted for some more or less trivial complaint recover from this and later, while still in hospital, develop D. and V., become dehydrated, and die from undiagnosed mastoiditis. Further, many infants during convalescence from a severe air-borne infection also develop D. and V., become dehydrated, and die from undiagnosed mastoiditis.

There are two main reasons for the occurrence of these catastrophes: (1) bottle-feeding while lying down; (2) nursing a sick infant on his back. In both cases in this position mastoiditis is invited by food, vomit, or infected mucus entering the Eustachian tube. Bottle-fed infants should never be fed lying down; while feeding they should always be held in the natural position by a nurse. An infant too young or too ill to sit up or turn over should always be nursed well propped up, and should be turned at frequent intervals, first on one side and then on the other, and never be allowed to lie on his back. If these two simple rules were universally adopted many infant lives would be saved.—I am, etc.,

Liverpool.

P. W. LEATHART.

### Sciatica

SIR,—I have read with great interest the contributions on sciatica in recent issues of the *Journal*. Would you kindly spare me a little space for a few general observations? It is generally known that sciatica is not a fatal disease, and that most persons who get it are cured in a longer or shorter time with the ordinary methods of treatment. Some few who are cured of the pain carry with them a slight paresis of the leg; others have intermittent bouts of discomfort in their extremity, though not frank pain. I have not heard or seen in 30 years of medical experience any sufferer from the complaint permanently disabled from following his avocation. I was present at the Annual Meeting of the B.M.A. when James Barr of Chicago read his paper on the prolapsed intervertebral disk and its operative treatment, wherein he mentioned that some cases did not even benefit from the operation, and that some others acquired a tolerance that is compatible with a nearly normal life without operation. At that time I formed the opinion that if I got sciatica due to a prolapsed disk I would certainly hesitate to undergo a serious operation with no certainty of cure, and would rather be content to carry on with a partial disability.

It has never been clear to me how the intervertebral disk prolapse occurs. When the semilunar cartilage of the knee

gets displaced it is always due to sudden trauma. In the disk prolapse no such cause is observable. Moreover, it is not known whether there are normal people with prolapsed disk who do not suffer from any inconvenience. The discovery of the prolapsed disk with sciatica does not negative the possibility of a prolapsed disk with no symptoms.

It is not my intention to put back the clock of surgical endeavour, but we should not forget that colectomy for bands, adhesions, etc., was in great vogue within living memory. It is admitted that sciatica has a psychological basis: in plain language it suits the patient to have sciatica. Is it unlikely that members of our profession sometimes fall into the same pit when advising a certain line of treatment for their patients?—I am, etc.,

Waterford.

A. J. D'ABREU.

### Just Suggestion?

SIR,—I have read with the greatest interest the recent correspondence upon the subject of "fibrositis," "sciatica," and "myositis." It would seem that not only are these misnomers but that all methods of treatment hitherto employed for the relief of this disease might well be abandoned without much disadvantage to the sufferer, since each and every one of the therapeutic measures adopted are fundamentally neither more nor less than a combination of auto- and hetero-genous suggestion.

Once this is admitted the sufferer can, with a clear conscience and without prejudice to his chances of recovery, put himself into the hands of the orthodox or unorthodox practitioner according to his predilection or fancy. The admirable letter by Dr. Gallop on suggestion makes entertaining or depressing reading according to one's humour at the moment. It sums up what I feel sure, often seems "the long and the short of it" to those of us who have had any considerable experience of general practice, especially when one allows a cynicism born of advancing years and length of service to colour one's mental outlook.

Recent letters in your correspondence columns seem to point to the inevitable conclusion that, with the very obvious exceptions of a few specifics, such as the employment of the sulphonamides and penicillin, all forms of therapeutics can be dismissed as empirical, continually being proved to be scientifically unsound, and therefore to be relegated to the limbo of the "magic" of the medicine man. Suggestion, suggestion! is that all that we practise? According to the pundits the balance of evidence would seem to have established this as an indisputable truth. Well, well, and Amen!

However, the real purpose of this letter is to ask a question which very intimately concerns my personal welfare. For many years now I have suffered from recurrent attacks of "fibrositis." I apologize for the use of so unscientific a word, but it is merely to use a term which will convey in the vernacular this painful disability. I have from time to time been "cured" by massage, ultra-violet and infra-red rays, short wave, Droitwich brine. When the exigencies of my work have allowed time for these indulgences, all these therapeutic measures seem to have contributed to the exorcism. Alternatively, when time for these treatments has not been available, "cure" has been spontaneous, unless perseverance with one's work, punctuated *sotto voce* by a wealth of bad language, can be regarded as a sound therapeutic measure. I have received much kindly advice from sympathetic colleagues, from the cheerful instruction to perform the impossible feat of swinging my lame and extremely painful leg over the back of a chair to the extraction of my few remaining teeth and the instalment of a utility set of dining-room furniture. When afflicted I have been physically incapable of carrying out the former, and even when at my worst have not yet adopted the latter, since my own experience, which I now find supported by one of the highest authorities, has convinced me of the fallacy of the focal sepsis theory in the vast majority of cases.

Meanwhile I continue to have attacks as well as long intervals, sometimes very many months, of complete freedom. Is my disease psychosomatic, and if so, what hope have I? Suggestion could obviously not be taken seriously or hope to succeed in my case.—I am, etc.,

Oxford.

J. FRANKLAND WEST.



### Deep Massage

SIR,—In these days of emphasis on rehabilitation by progressive exercises surgeons may lose sight of the fact that certain soft-tissue lesions, commonly met with at fracture and orthopaedic clinics, cannot be cured—or at best very slowly—by active movements alone. Masseuses should be urged to display their therapeutic powers and thus bring into prominence the essential nature of the services they can give in this part of their field. Surgeons in charge of these clinics are thus asked to co-operate by sending to their masseuse, with a request for deep friction to the site of the lesion, cases of non-specific tenosynovitis at the wrist and ankle; supraspinatus and patellar tendinitis; traumatic and rheumatic lesions of any part of the erector spinae muscle, of the deep lumbar fascia, and of the supraspinous ligaments; injury, whether recent or long-standing, to the internal lateral or coronary ligaments at the knee.

It is not generally realized quite how effective deep massage can be in mobilizing soft structures so placed that active movements alone achieve this end imperfectly or not at all. This fact leads me to request that masseuses should be given a chance to show how indispensable their manual work can be in the proper case. Though the conditions listed constitute only a small fraction of a masseuse's scope, they have been selected for their slow recovery under orthodox treatment and for the spectacular response that adequate friction regularly achieves.—I am, etc.,

London, W.1.

JAMES CYRIAN.

### Chemistry of Vitamin Therapy

SIR,—In your issue of Jan. 29 Dr. Griffith Evans refers to the Ministry of Health vitamin test scheme, suggesting that no steps were taken to estimate the vitamin sufficiency of the children tested. This is not correct, as in conjunction with, and with the approval of, the Ministry of Health every child in the scheme in Glossop was tested regarding his sufficiency or otherwise in vitamin C by the method mentioned by Dr. Evans, and in addition blood tests for vitamin C were carried out. Further, every child in the scheme was tested for vitamin A by the dark-adaptation test, etc. (the criterion of vitamin-A deficiency being that of Steven and Wald). An account of the work and of the findings was published in the *Journal* of Oct. 16, 1943 (p. 447), by Drs. Kohn, Milligan, and Wilkinson. It will be seen in this paper that in some instances the children having the vitamin capsules did significantly better than those who did not get them.—I am, etc.,

Glossop.

E. H. M. MILLIGAN.

### Plastics in Splint-making

SIR,—I was glad to see in your issue of Jan. 29 (p. 152) Mr. Campbell's article drawing attention to the value of perspex as a medium for making splints where it is desirable to combine lightness with strength. Undoubtedly this plastic has a great future in the field of splint-making, and I would like to record some simplifications in technique, which are not referred to by Mr. Campbell and which I have found in the course of six months' experimenting with the material.

1. *Softening by Heat.*—If a local kink is wanted it is best to heat the perspex in a bunsen burner; it then remains hot for some minutes, giving ample time for the required shaping. If a large sheet is wanted supple, this is best held over a wide gas-ring. When heated in water it does not stay malleable so long as when dry-heated.

2. *Cutting.*—When heated as above the material is cut as easily as pastry by strong hot scissors. Sawing it cold is a very laborious process and very injurious to the saw. The perforations for stitching webbing straps on can be produced by an electric drill on the cold material. If the strap is carried completely round the splint, very few stitch holes are needed, as compared with a strap on one side pulling directly on the stitches.

3. *Moulding.*—When the material has been heated one can mould it most accurately with one's hands if they are protected with a pair of asbestos gloves. Any metal tongs used on the material must be heated, for cold metal cracks the hot perspex. If moulded thus it is rarely necessary to prepare a plaster

model first, which is itself a laborious and fairly expensive process, and is particularly tricky for fingers and thumb, the very organs for which perspex is admirably adapted.

4. *Cooling.*—If quick cooling is desired, as when there is no cast on which to bandage the splint while hot, this can be readily induced by exposing the region involved to the cold blast of an electric hair-dryer. If it is cooled too rapidly the perspex becomes brittle, like very highly tempered steel.

I have produced dorsal cock-up splints for foot-drop and wrist-drop (with ring to sole or palm); also abdominal apron for poliomyelitis, and various types for paralysis of the intrinsic muscles of the hand. I am trying it for spines.—I am, etc.,

Bath.

M. FORRESTER-BROWN.

### Removal of Massive Calculus: Recovery

SIR,—The letter by Mr. J. Armstrong (Feb. 5, p. 200) on multiple vesical calculi recalls to my mind a massive single calculus which I removed from a Mesopotamian Arab in 1917. The victim was a well-known beggar who sat at the entrance to the native bazaar in Amara. He was unable to stand erect, and every few minutes crawled away to squeeze painfully a small quantity of urine from his bladder. I persuaded him to come into hospital, and with the help of the late Capt. J. M. Downie I removed a calculus, with the aid of midwifery forceps, which weighed 2 lb. 7½ oz.

According to local custom the patient's friends removed him from hospital on the day following operation, and carried him to their village some miles away in the marshes. His dressings were discarded, and the wound plastered with warm camel dung caught in a receptacle before reaching the ground. About three months later I saw a small crowd in the bazaar, and on investigation found a man exhibiting the stone at "an anna [penny] a peep." I asked him where he obtained it, and he startled me by pouring out profuse thanks for having cured him. His condition was so much improved that I thought he was an impostor until he threw aside his clothes and exposed a well-healed scar.—I am, etc.,

London, W.1.

MCNEILL LOVE.

### Tonsillectomy in Children

SIR,—For a long time now articles have appeared in various medical journals, generally backed by statistics, purporting to show that tonsil and adenoid removal in children is at the best useless and even may be harmful. That this opinion, even after many years, is held by a small minority is obvious and, I think, significant. In hospitals up and down the country laryngologists still struggle with nearly overwhelming lists of children for tonsillectomy, urged on by those watchful observers, the paediatrician, the general practitioner, and the school medical officer, who, in turn, are backed by the parents and the school teacher.

I have had the opportunity of observing the effects of this operation over a long period at various hospitals in London, including a large children's hospital, and I have always tried to be impartial in my judgment, both as to results and statistics. That the latter may sometimes unwittingly be fallacious I discovered when, before the war, I examined in a provincial centre over 500 reputed tonsillectomized children, and found that less than 17% had had their tonsils and adenoids adequately removed.

Regarding results, I have always found these to be excellent provided that the well-known criteria for operation were adhered to, and that the tonsils, all the tonsils, and nothing but the tonsils, were removed, and that the adenoids were removed without damage to the Eustachian cushions. It has been my observation that chronic ear and sinus infections are most frequently seen in children with unhealthy tonsils and adenoids, and that an essential factor in the successful treatment depends upon removing this tonsillar sepsis. In private practice, where there is more time to talk with the parents and doctors concerned, one hears in detail of the progress made. I have had parents who, vividly remembering the improvement made in other children after operation, have been disappointed and a little dubious when I have advised against tonsillectomy in another child of the family as unnecessary.

I wonder which camp would claim this case. Last spring I was asked to see a boy of 12 who a few years previously

had had a tonsil and adenoid operation. Subsequently he developed scarlet fever and a chronically discharging ear. On examination of the throat there were large tonsillar remains and much scar tissue. Cervical adenitis and bilateral antral infection were also present. The removal of the tonsillar remains has resulted in a dry ear, with a hearing loss measured audiometrically now trivial. The child has put on weight and the antral condition has now subsided.

I write this letter realizing that it is impossible for one person to cover adequately the ground of even one operation, and that to arrive at a balanced judgment results must be taken from many angles and from many observers.—I am, etc.

London, W.1.

E. CAREW-SIEM

### Cleansing Gas-contaminated Persons

SIR.—I see from your issue of Jan. 29 (p. 163) that my article on teaching "gas" by means of a miniature gas-post has brought forth a torrent of criticism. First I am accused of having made a glaring mistake in publishing a dangerous diagram, and I am told that I should have read the official handbooks. I can only reply by referring Cmdr Pitt Palmer to p. 89 of *A.R.P. Handbook*, No. 1 (2nd ed.), where he will see the eye douche in the same position. This also is the position it occupies in the latest circular issued by our local authority. I entirely agree with him that liquid gas in the eye must be removed at the very earliest moment and that it is best done with warm water, but warm water is not available immediately in an outer shed, nor are the conditions there suitable for eye douching at night.

Cmdr. Pitt Palmer quotes my words "not to instruct, but to show how instruction may be given." He then goes on to say that, according to the diagram, the patient must go through endless formalities with labels, string bags, etc. and eventually be undressed before his eyes are attended to. May I ask in which part of the diagram (which does not illustrate technique) is a patient shown passing through with contaminated eyes? Or can he quote one single word in the article which suggests that we practise as he asserts that we do? He remarks that the basis of all training is common sense; but he is not very generous in accrediting this virtue to others.

That the patient is taken to the eye-douching section immediately, and is undressed after his eyes have been attended to, is merely complying with the instructions given in *A.R.P. Handbook*, No. 2 (4th ed.), p. 12, which states: "The patient should be directed at once to the place where the eye douching is to be done, notwithstanding that this is a departure from normal procedure." That the patient should not be undressed first was clearly indicated, even in the amendment to the 3rd ed., p. 13, where the words "the casualty, who will have been undressed" were deleted. On the same page the following words were added: "Care should be taken to avoid, as far as possible, his coming into contact with persons who have removed their contaminated clothing," which suggests that the eye douching has been carried out indoors.

In reply to the sarcastic "eye douche (singular)," may I remind your correspondent of the obvious—i.e., that the miniature gas-post was for teaching only, and was never therefore intended for full practice, which is still given in a fully equipped gas-post. I am pleased to assure Cmdr. Pitt Palmer that we have a supply of antgas ointment at the "dirty" end of our gas-post. It was not considered necessary to mark small items of equipment on the diagram, which was intended to indicate solely the general lay-out of a gas-post.—I am, etc.,

Edinburgh.

POLLOK DONALD.

### Emulsions

SIR.—Dr. W. F. Cooper is to be congratulated on his letter of Jan. 29. Its implied criticism is applicable to every dermatologist, and indeed every physician who has the temerity to sign his name to a prescription. A moment's thought on Dr. Cooper's letter induces a realization of almost complete ignorance as to how medicament reaches tissue or bacteria, and of the physical rules governing such contact. Few of us consider how this last can be rendered more intimate. So far as I am aware there is no dermatologist to-day with the necessary mathematical or physicochemical knowledge to follow

up Dr. Cooper's "provocation"—a matter for regret. It is to be hoped that a physical chemist with an interest in medicine will some day arise to answer the demand.

Is it too much to hope that paraffin molle and aqua pura will be finally relegated to the realm of "inert" vehicles and replaced by co-operative rather than passive diluent?—I am, etc.

Manchester.

P. B. MUMFORD.

### Collaboration in Hospital

SIR.—The Medical Council of St. Bartholomew's Hospital recently celebrated the centenary of its formation. The resolution forwarded to the medical officers by the Governors in July, 1843, was as follows:

"That a Medical Council be formed to which may be referred matters relating to the Medical department of the Establishment, and to the Medical School.

That the Council do consist of the Physicians, the Surgeons, the Senior Assistant Physician, the Senior Assistant Surgeon, and a Secretary, to be appointed according to rotation from the four remaining Medical Officers, and that the Senior Member present at the commencement of Business do take the Chair.

That in the event of any of the said Physicians, Surgeons, Assistant Physicians, or Assistant Surgeons lecturing at, or being in any way connected with any other School than that of this Hospital, he, or they shall be disqualified from acting as Members of the Council.

That all business brought before the Council shall be decided by the majority present, except such matters as are to be submitted to the Treasurer, and Almoners, or Governors, when every Member of the Council be required to attend, and no decision of such Council shall be conclusive unless the majority acquiesce therein.

That in all the reports of proceedings submitted to the Treasurer, and Almoners, or the Governors, the names of the Members present shall be stated.

That all business referred for the consideration of the Council from the Governors be inserted in the summonses convening such Meeting."

This step was taken so that the treasurer and almoners might consult the hospital staff on matters of medical importance. In view of the present emphasis upon medical reorganization it was thought that the matter might be of interest to your readers.—I am, etc.

F. C. W. CAPPS,

St. Bartholomew's Hospital.

Hon. Secretary, Medical Council

### The Doctor's Vocation

SIR.—J. S. Fairbairn's death has been recorded with many appreciations of his life's work. The tone of these appreciations has brought to my mind the following excerpt from a letter of a father to his son:

"I have been thinking very anxiously over your letter. We must now decide what you are to be. There is indeed nothing I could more desire than to see you a good doctor; and a good doctor you will be if you are a good man working for the right reasons.

"There is no harder life than a doctor's; but so far as it is mere hard work it is not to be feared. What does not involve labour is not worth doing. But think of this: a doctor has to care for human life—he has suffering and disease to cure. The living look to him to save the dying and the dying look to him for life. You can remember from our experience of last year how much unnecessary pain a doctor's error of judgment may cause; and mother can tell you of many cases where an error of judgment has had more serious results—has caused loss of life. But we know also how much a doctor may do for a patient—Dr. Keith saved our dear Barbara; we shall never cease to be grateful to him for the kindness and skill which gave her back to us. And many a life he has so saved.

"Now do you know why I am saying this? To make you understand the grave responsibility of choosing such a profession—I would not have a son of mine enter it unless it were to do his duty in it; and his duty is to use all his energies and efforts to lighten the suffering and sorrow of man. What this means you cannot as yet fully know, but if you feel that you can be the best possible and do the noblest possible by being a doctor, then a doctor, so far as I can help you, you shall be. And I will stand no longer in the way of your practical chemistry.

"When you were a little child, I often thought how willingly I would consent to be nothing and do nothing in the world if I could

only make you a good man! And I feel so still—anxious only to see you one who could serve your God and your kind! If you do that, I shall be happy to be remembered only as your father. . . .”

The son was about to choose medicine as a career. The father was Andrew Martin Fairbairn and the son was J. S. Fairbairn. The letter was dated April 12, 1884, and was published in *The Life of Andrew Martin Fairbairn*.—I am, etc.,

Carmarthen.

J. R. E. JAMES.

### A Health Journal for the Layman

SIR,—I am perturbed by a certain class of literature on “health,” “hygiene,” “psychology,” “sex problems” which is in circulation in the form of magazines, booklets, correspondence courses, and the like. This type of publication does not usually come the way of practitioners, but those who took pains to look into it would be astonished at the extraordinary jargon which is hashed up and dished out for popular consumption. If there are people with a sincere desire for expert instruction, then it would not seem to be in their best interest that their need should be exploited by what may fairly be described as the pseudo-scientific press.

It is highly dubious whether the available material serves any worth-while social purpose; and there is no doubt that in some cases harm may result. For example, there are individuals who, acting on directions, persevere in douching the nose with irritating fluids for the treatment of a cold or to prevent further colds. As might be expected, what usually happens is to prolong the cold into a period of months with the danger of spread of inflammation into the Eustachian tubes. More ominous is the case of a young woman who, following a course of instructions to the letter, was resolute to rid herself of dreams by “sheer force of willing.” The disastrous effect on the mental state of such a devastating procedure can well be imagined. Some fantastic things are perpetrated under the guise of “psychological” drilling. I dare say that most practising doctors could mention similar incidents.

Cranks there will always be, but there are others with a genuine desire for knowledge and guidance, and the normal healthy-minded person would be the first to welcome clarification of topics relevant to the health of the individual and the social body. I venture to suggest that, in the light of the present conception of social medicine, the time is opportune to offer to the general public full facility for rational approach to authentic and up-to-date information and authoritative views. True, something is already being done: broadcasts by doctors, lectures on psychology, publication of pamphlets are steps in the same direction; but not everyone can listen to broadcast talks or attend lectures, and pamphlets may not get through to the populace. It may be that certain aspects of health education could be effectively presented in the form of a journal; there is something personal and vivid about a current periodical with familiar lay-out and features and that sense of news fresh from the print. And the art of attractive composition is not entirely foreign to medical writers. I suggest there would be scope for the right kind of health journal and at this would be a useful social asset.—I am, etc.,

Salford.

JOSEPH PARNES.

### Consultant and Specialist Services

SIR,—Certainly Mr. H. J. McCurrah (Jan. 29, p. 158) has reason for being perturbed about the totalitarian methods which are being employed to frame the future of consultants. As nine out of ten consultants in the United Kingdom are not attached to undergraduate teaching hospitals, it is difficult to understand why nine out of ten of the committee selected to meet the Minister of Health in connexion with the Beveridge scheme were drawn from the staffs of undergraduate teaching hospitals. Can it be that the Minister's primary consideration is the betterment of undergraduate teaching, which indeed is in need of reform; or, midst this oyster-like secrecy, are we to assume that for the present the welfare of the “herrenvolk” of consultants is the Minister's first concern? As time goes on, perhaps we may look forward to a plebiscite of the remaining nine-tenths of the consultants.—I am, etc.,

HAMILTON BAILEY.

## Obituary.

E. R. MORTON, M.D.TOR., F.R.C.S.ED.

News has been received of the death in retirement at Gullane, East Lothian, of Dr. E. Reginald Morton, who in former years was a leading radiologist in London, holding the post of medical officer in charge of the electrical department of the London Hospital and later that of radiologist to the West London Hospital.

Edward Reginald Morton, son of Edward D. Morton, M.B., was born in Barrie, Ontario, on Oct. 14, 1867. He graduated M.D., C.M. at the University of Toronto in 1890, and took the Scottish Triple qualification and the D.P.H. in the following year; in 1893 he became F.R.C.S.ED. Soon after graduation he accompanied Lord Brassey on the yacht *Sunbeam* as medical officer on a voyage to Australia and then for a short time assisted his father in practice. After the discovery of the x rays by Roentgen, Morton took a keen interest in the medical possibilities of the new rays and became one of the pioneers in this country. He was then in general practice at Taunton, experimenting with x rays in his spare time. His work soon attracted attention, and in 1904 he moved to London and was appointed to take charge of the electrical department of the London Hospital. In 1909 he gave up that post and became medical officer in charge of the x-ray department of the West London Hospital and lecturer in radiology at the West London Postgraduate College. During the last war he acted as radiologist to No. 2 London General Military Hospital, and after the armistice he visited Erlangen in Bavaria, where his friend Prof. Schrumph had been developing deep x-ray therapy during the war. On his return Reginald Morton introduced the new technique to this country. In 1922 he accepted an invitation to lecture on the subject in the U.S.A. and Canada. He made an extended tour of both countries and gave many lectures in Toronto, New York, Los Angeles, and other cities. On that tour he was accompanied by his old friend General Fotheringham, R.C.A.M.C.

Morton was a past-president of the Electrotherapeutic Section of the Royal Society of Medicine and a corresponding Fellow of the Academy of Medicine of Toronto and of the X-Ray Society of North America. He joined the R.M.A. in 1897, was secretary of the Section of Therapeutics in 1906, and president of the Electrical Section at the Annual Meeting of 1908. He published *Essentials of Medical Electricity and Radiology* in 1910, and five years later a *Textbook of Radiology*, which reached a second edition. In 1926 he retired to his summer home at Westbourne, Gullane, where he lived happily until his death on Jan. 21.

JOHN BARLOW, M.D., F.R.C.S., F.R.F.P.S.G.

Dr. John Barlow, whose death took place at his home in Callander on Dec. 27, 1943, was the oldest member of the medical profession of Glasgow. He was born in 1853 at Leigh, near Manchester. He studied medicine in Anderson's College, Glasgow, and at Glasgow and Edinburgh Universities, graduating M.B., C.M.ED. 1875, and M.D. 1879, having previously qualified M.R.C.S.Lond. in 1874. In 1881 he became F.R.F.P.S.Glas., and in 1885 F.R.C.S.Eng. He devoted himself in his early years to physiology, first as assistant to Prof. McKendrick in the University of Glasgow, then as the first Muirhead demonstrator in physiology in the Royal Infirmary School of Medicine, and later as professor of physiology in St. Mungo's College, into which was absorbed the Royal Infirmary Medical School. He lectured in physiology at the Royal Technical College of Glasgow, and was, in addition, a most acceptable lecturer to popular audiences. His training and intimate knowledge of physiology proved of great service when he began work in surgery, his real professional objective. In 1892 he was appointed visiting surgeon to the Royal Infirmary of Glasgow, and on retirement in 1913 was appointed honorary consulting surgeon.

Dr. Barlow took an active part in the work of the Royal Faculty of Physicians and Surgeons, as examiner and as a

member of council, and finally, from 1913 to 1915, as president. He was a fluent and telling teacher of both physiology and surgery, and, although making no claims in originality or in research, he did good solid work. Some of his contributions to these subjects were "Physiological Action of Ozonized Air," *Journal of Anatomy and Physiology*, "Saunders of Surgical Operations, 1883-1892," *Glasgow Medical Journal*, and "Intussusception in Infants treated by Abdominal Section," *Lancet*, 1899. Three members of his family became members of the medical profession; one of his daughters is the wife of Mr. George Mowat, surgeon to the Royal Infirmary, and is doing wartime work in the Eye Infirmary, Glasgow.

#### SIR JOHN RAMSAY, CBE, MS, FRACS

A Reuter message from Melbourne has announced the death of Sir John Ramsay, former president of the Tasmanian Branch of the British Medical Association, and for 14 years surgeon-superintendent of the Launceston General Hospital, Tasmania.

John Ramsay was born in Scotland on Dec. 26, 1872, son of John Ramsay and Margaret Thomson. In early life he went to Australia and studied medicine at Melbourne University, graduating M.B., B.S., and afterwards proceeding to the M.S. degree. He then made his home in Tasmania and became consulting surgeon to the public hospital at Launceston. During the last war he served with the rank of major as surgeon to the 12th Australian Hospital in Tasmania, and for his military services was created C.B.E. After his retirement from the post of surgeon-superintendent of the Launceston General Hospital he was elected consulting surgeon. Sir John Ramsay was one of the founders of the Royal Australasian College of Surgeons in 1926; he served for six years (1920-6) as president of the Tasmanian Branch of the B.M.A., and had been elected a member of the Association as long ago as 1894. He was created a knight in 1939, his name appearing in the New Year Honours List for services to surgery in the Commonwealth of Australia. He had been a keen cricketer in early days, kept up his interest in golf, and was the first president of the Rotary Club of Launceston. He married Ella Elizabeth Pegus Dudley of London, and had three sons and two daughters.

#### MOHAMMAD HUSNAIN, O.B.E., M.B., F.R.C.S. (Ed)

Prof. Mohammad Husnain, head of the department of ophthalmology at the Prince of Wales Medical College, Patna, died suddenly at Patna on Sept. 10, 1943, in his forty-seventh year. To those who knew him well and had had the privilege of working with him the news of his death brought a deep sense of personal loss. In him the Medical College lost a very able teacher and the medical profession lost an eminent ophthalmic surgeon.

Prof. Husnain was educated at the Calcutta Medical College, and obtained the M.B. degree of Calcutta University in 1921. He joined the Provincial Medical Service in Bihar the same year and was posted to the public health department. In 1925 he was appointed house-surgeon in the department of eye, ear, nose, and throat of the Medical College Hospital at Patna, and later worked as house-surgeon in the general surgical wards in the same institution. In 1929 he proceeded to Europe, and obtained the diplomas of D.L.O. (London) and D.O.M.S. (London). In 1930 he was admitted as a Fellow of the Royal College of Surgeons of Edinburgh. Later he worked as house-surgeon at the Birmingham and Midland Ear and Throat Hospital for 8 months. On his return to India in 1931 he was appointed lecturer in ophthalmology at the P.W. Medical College, Patna, and in 1935 he was made professor in the subject. He was a Fellow of the Patna University and a member of the Faculty of Medicine and Board of Studies in Medicine. He was a member of the Bihar Branch of the British Medical Association and was president of the branch in the year 1942. He was made an O.B.E. in the New Year Honours List of 1943. He leaves behind a widow and a large circle of friends and admirers to mourn his loss.

The Bihar Branch of the B.M.A. has passed a resolution placing on record its deep sense of sorrow at the premature death of Prof. Husnain, a member of the Association since the inception of the Branch and one of its ex-presidents.

News has been received of the death at Cannes in October of Dr. ARCHIBALD ADAM WARDEN, from whom only occasional messages had come through since the fall of France. Born in Edinburgh on May 11, 1869, Dr. Warden was educated at Rossall School and Glasgow University, where he graduated M.A. in 1889, M.B., C.M. in 1893, and M.D. in 1898. After serving as resident in the Western Infirmary, Glasgow, under Sir Hector Cameron and Dr. Samson Gemmell he went to the Hertford British Hospital in Paris as R.M.O. and received the diploma of Docteur en Médecine de la Faculté de Paris in 1899. He then started private practice in that city and became physician to the British and the American Hospitals, and soon secured a large clientele. He extended his work to Cannes, and some 20 years ago left Paris to devote himself to medical practice in Cannes and its neighbourhood. During the last war he served with the British Forces at a hospital at Dieppe. Dr. Warden had been a well-known lawn-tennis player, both as a student and afterwards in France, where he won the French doubles championship with W. S. M. Vines in 1896; he was also a very early motorist and an enthusiast for the open-air life in summer and winter. He was for some years an occasional contributor to the *Lancet* and the *B.M.J.*, and at the time of his death was known to be working on *The Reminiscences of a Scots Doctor in France*. Dr. Warden's visits to Scotland were rather infrequent, as he preferred that his British friends should spend holidays with him in the South of France; he attended the British Medical Association Meeting in Glasgow in 1922, when Sir William Macewen was President. His wife is a daughter of the late Prof. McKendrick of the Chair of Physiology in Glasgow University. He is survived also by a daughter and two sons, one of whom is a prisoner of war in Japan.

The death occurred on Oct. 26, 1943, of Dr. HUGH JOHN O'PREY at his home in Antrim Road, Belfast. Born at Portaferry, Co. Down, in 1885, he graduated M.B., B.Ch., B.A.O. of the Queen's University of Belfast in 1918. After a year as house-surgeon in the Mater Infirmorum Hospital, Belfast, he was clinical assistant in the Samaritan Hospital for Women, London. For more than twenty years Dr. O'Prey carried on an extensive family practice and established his reputation as a skilful and resourceful obstetrician. His fatal illness became apparent some months ago, and he faced it's inevitable end with faith and courage. He is survived by his wife and two children.

News has reached this country of the death of Dr. ROBERT DONALD FLETCHER on Dec. 13, 1943, from coronary occlusion, in Hollywood, Florida. Dr. Fletcher was born in Edinburgh on July 16, 1878, and was educated at Watson's College, Edinburgh, and graduated M.D. at the University of Manitoba in 1903. He practised medicine in Winnipeg and was professor of urology at the University of Manitoba, from which he retired about 1936. He was a member of the British and Canadian Medical Associations and of a number of American urological societies. He is survived by his wife and three daughters.

We regret to announce the death on Jan. 26 at his home at Skinburness, Carlisle, of Dr. JOHN WELSH SMITH. He studied medicine at the University of Edinburgh and graduated M.B., C.M. in 1890; thereafter for 45 years he gave faithful service as medical officer to the parish of Dunscore, Dumfriesshire. Dr. Smith joined the British Medical Association in 1894, and was chairman of the Dumfries and Galloway Division in 1933-4 and president of the Border Counties Branch in 1936-7. He was very well known socially and professionally in the South of Scotland, and his election to these two offices in the B.M.A. gave proof of the esteem and regard in which he was held by his colleagues. Possessed of many attainments, he travelled on sea for several years before settling down in general practice at Dunscore. He took a keen interest in languages, including ancient Greek and Arabic, and he also spoke a number of modern languages quite fluently, including French, Russian, and German.

Dr. TOM STANSFIELD, honorary consulting physician to the Royal Berkshire Hospital, Reading, died on Jan. 25, aged 57. A student of Guy's Hospital, he graduated M.B., B.S. (London) in 1910 and then became house-surgeon to the Dorset County Hospital, Dorchester. During the last war he served with the rank of temporary captain, R.A.M.C., and after returning to civil life in 1919 was appointed physician and medical officer in charge of the special eye department at the Royal Berks Hospital. Dr. Stansfield joined the British Medical Association in 1917, was chairman of the Reading Division in 1936, and had been president of the Berks, Bucks, and Oxford Branch. Dr. Tom Stansfield (writes S. C. A.) spent most of his life in Reading, where his father was in practice. After leaving Guy's he worked for a short time in Birmingham and Taunton, and

then, on the outbreak of war, volunteered for the R.A.M.C., with whom he spent the next four years. He was wounded in the head. After the war he settled with his father in Reading and continued the practice alone after his father's death. He was never in robust health, and was unable to carry on his work at all since last May. Two years ago he resigned his position as assistant physician at the Royal Berkshire Hospital, a position he had held for 21 years. He was always a very active member of all medical organizations in the district. He was honorary librarian to the Reading Pathological Society for many years. He was a past-chairman of the Reading Division as well as the Berks, Bucks, and Oxon Branch of the B.M.A. For twelve years he was chairman of the Reading Insurance Committee and for a longer period he served the profession as chairman of the Reading Panel Committee and the Borough of Reading Medical Society. He was a valuable member of the Reading Medical War Committee. From his father, who was the greatest authority on British ferns in his time, he inherited a great love of natural history. Some years ago he was elected a Fellow of the Linnaean Society. He also acted as secretary of the Pteridological Society. Dr. Stansfield will be sadly missed by his colleagues in Reading.

Dr. ARVID LUDVIG KELLGREN, who died in London on Jan. 31, was born at Alingsås in Sweden on April 25, 1856. He decided to follow in the footsteps of his elder brother, the well-known medical gymnast Henrik Kellgren, and graduated at the Royal Central Gymnastic Institute of Stockholm during 1879. He then determined to study medicine and went to Edinburgh, where he graduated as M.B., Ch.B. in 1886. After this he devoted himself entirely to the practice of medical gymnastics according to the methods of Ling and his brother Henrik. During 1888, for his successful treatment of the Empress of Austria, he became the recipient of the Austrian Imperial Order of the Iron Crown. During the same year he demonstrated the Ling-Kellgren methods at the Naval Hospital at Pola, and an extensive paper on them was published in the *Stat. Sanber. d. K.K. Kriegsmarine* for 1888. This communication formed the basis of his thesis which was accepted with commendation for his graduation as M.D. in 1890, under the title of "The Technique of Ling's System of Manual Treatment." These two works contained the first detailed description of Henrik Kellgren's so-called "nerve frictions and vibrations," and the thesis mentioned was translated into French, German, and Italian. Kellgren made a number of researches on the physiological effects of massage and vibrations which were duly published in *Clin. franç.*, 1894, *C. r. Soc. Biol.*, 1895, and *Arch. de Physiol.*, 1896. Further researches, made in conjunction with Dr. Carlo Colombo of Rome, were issued in book-form during 1897 under the title of *Absorption of Exudations under the Influence of Massage*. A paper with practical demonstrations on new movements in manual treatment was read by him before the International Congress of Medicine at Rome in 1894. At the hands of the King of Sweden he received the decorations of Knight Commander of the Vasa and Knight Commander of the North Star.

Dr. MAYNARD HORNE, who was born on March 30, 1870, and died at Rickmansworth on Feb. 7, 1944, was educated at Haileybury, Trinity College, Cambridge, and St. George's Hospital Medical School. He was for a time in general practice, and served for many years as physician to the Margaret Street Hospital for Consumption; but most of his professional career was devoted to the specialty of anaesthetics. Having qualified M.R.C.S., L.R.C.P. in 1899, and taken the M.B., B.Ch. at Cambridge in 1901, he held house appointments at his own hospital, which he served also later as anaesthetist, and where he was made consulting anaesthetist on his retirement. He had also been anaesthetist to the Hospital for Women, Soho Square, the Seamen's Hospital, Greenwich, and the National Orthopaedic Hospital. He had an aptitude, almost a genius, for friendship—Polonius would have liked to know him. He married, while still a student, Lillie, daughter of the late Mr. T. Pearson, and had one son and two daughters. He was a highly expert and enthusiastic lawn tennis player; and when already a grandfather could often astonish men many years younger by his activity and the high standard of his play. During the first world war he served as a captain in the R.A.M.C.(T.) at base hospitals in France. He was a colleague whose friends will sadly miss his cheery personality.

The following appreciation of Lieut.-Col. DONALD UVEDALE OWEN, whose death on active service was announced in the *Journal* of Jan. 8, has been received from a Liverpool colleague: Donald Owen had been away from us right from the beginning of the war, called up for service as a Territorial officer. Before long he was in charge of a general hospital, which he later took to the Middle East. His experience in tropical diseases

led to specialized work in that field, and last year he was mentioned in dispatches for distinguished services. Then came the news of his illness—how serious many of us hardly realized until we heard that on his way home he had to be put off the ship and left behind in South Africa, there to have weekly blood transfusions for an aplastic anaemia. Donald was a first-rate clinician, all the sounder for the time he had spent with Warrington Yorke as clinical pathologist to the Liverpool School of Tropical Medicine. With his election to the staff of the Royal Southern Hospital, he transferred his energies to general medicine, and after a few years there he became assistant physician to the Royal Infirmary. Among various papers which he published two of them stand out as illustrating his quality—a careful study of urobilinuria, done in Yorke's department, and a sensible, illuminating re-examination of Pancoast's "superior sulcus tumour," in collaboration with Hewer and Whittaker. His patients, private or "hospital," were always impressed by the apparently endless time and care which he was ready to give them—even though it often meant that he was late for the next consultation; they used to say of him that he never seemed to be in a hurry to get away from them. He enjoyed his medical work, and he enjoyed life. He was a foundation member, and the first president, of the Innominate Club, the most junior of the medico-literary clubs in Liverpool. He was a keen tennis player, and he and a gynaecological colleague made up a doubles pair for Mersey Bowmen. Dancing, parties, students' dinners, all sorts of human contacts, he enjoyed them all, and in so doing made them pleasant for other people and especially for his friends. Good-natured, tolerant, and friendly, he nevertheless held firm and shrewd views. Had he come back to us safe and sound he would have been a tower of strength in the changing world of medicine which is upon us.

Dr. John Cahill writes: It is perhaps permissible for one who was closely associated with the late Prof. W. M. FALLON in his student days in Galway to pay a personal tribute to his memory. At that time, when he laid the foundations of his career, I could not help noticing his eager mind and the ease with which he combined interest in politics with interest in physiology. The event was to prove that he also possessed a still more valuable asset—the uncommon gift of vision—which enabled him to plan his career wisely from the beginning. Even a man of great ability—e.g., Wolsey—may lack this gift; of most of us, the words of Seneca ring true eternally—*Ignoranti quem portam petet, nullus sinus ventus est* (When a man does not know which harbour he seeks, no wind is the right wind). Years later, we spent a jolly afternoon together on the upper reaches of the Thames. He had just completed a course of study abroad and was full of ideas, full of enthusiasm. I never saw him again.

A correspondent writes: Medicine has lost a personality and a pioneer by the passing of HERBERT NOTT at Guildford on Feb. 2. After many years in practice at Long Sutton, near Birkenhead, Nott fell ill and was restored to health by colonic lavage with potassium permanganate. His interest in the treatment was stimulated and he used it extensively in a large practice. The success which followed led to the co-operation of several medical men, and in July, 1926, he published a paper in the *British Medical Journal* on thyroid and manganese in acute pneumonia. He went to live at Guildford and devoted his time to specialization in this treatment, and finally his book *Thyroid and Manganese in Treatment* was published. His implicit belief in the value of thyroid and manganese convinced a considerable number of medical men, but the lack of interest and even active opposition displayed by a section of the profession, including the Medical Research Council, were always a source of disappointment to him, and to the last he fought and strove to gain that general recognition for his technique which would allow humanity to reap the full benefit therefrom. Those who knew Herbert Nott will remember him as a good companion, a fine talker, and a firm friend, but he was a tough antagonist who did not easily tolerate criticism which was not based on practical experience, and his discoveries have not yet been sufficiently appreciated. Now that the value of trace elements such as manganese, zinc, and cobalt is beginning to be recognized and the all-important part played by the liver is becoming more and more apparent, it is probable that his pioneer work on these subjects will receive a far greater recognition from future generations in medicine than it has in the past.

The following well-known medical man has died abroad: Dr. LEO BUEGER, professor of urologic surgery at the New York Polyclinic Medical School, who gave his name to thrombo-angiitis obliterans in 1908, and was author of *Circulatory Disturbances of the Extremities*, aged 64.



## Medico-Legal

### USE OF A MEDICAL ASSESSOR

Many county courts have for long followed a practice in workmen's compensation cases by which the medical assessor examines the workman and reports his opinion to the arbitrator (the judge). The House of Lords has now ruled that this practice is wrong.<sup>1</sup>

A workman was ruptured at work and received compensation for total incapacity. He underwent an operation, but this was not completely successful. A few years later the employers required him to undergo a further operation. He refused, and they applied to the county court for a review or termination of the weekly payments on the grounds that his refusal was unreasonable. Sir Gerald Hulse, K.C., the arbitrator, was assisted by Dr. W. A. Broad as medical assessor. The employers called three doctors, who said that the operation was advisable and could be successful. The workman called two other doctors, who said the operation would be positively injurious to the man's nervous condition. At that his previous operation had left him with a neurosis. The arbitrator said that the medical assessor would like to examine the workman. This examination took place in private out of court and when the hearing was resumed the arbitrator intimated that the medical assessor's view was in favour of the proposed operation. After further argument from counsel he gave judgment for the firm, saying that he thought he was entitled to rely upon the advice of the medical assessor, who took the view that the operation would have no effect upon the workman's (nervous) condition. It was not dangerous, and he held the workman's refusal to have been unreasonable. He accordingly ordered that all payments should be suspended. The workman appealed unsuccessfully to the Court of Appeal and then to the House of Lords. The Lord Chancellor, Viscount Simon, pointed out that, as was held by their lordships recently,<sup>2</sup> the question of reasonableness is not to be determined by considering whether the best medical opinion would think the operation advisable or safe, but whether the workman, having regard to all the circumstances, including the advice of his own doctor, was unreasonable in refusing it. In other words, the court must consider the mind of the workman rather than the medical facts. The House, however, had another and wholly distinct reason for allowing the workman's appeal: that the arbitrator had wrongly allowed himself to be influenced by the medical assessor's advice. An arbitrator may submit to a medical referee for report any matter which arises in the arbitration, but whenever a referee examines a workman he must make a written report or certificate which is available to both parties. A medical assessor, said the Lord Chancellor, is one of the panel of medical referees, but that does not oblige the workman to submit himself for examination, and cannot constitute the assessor an unsworn witness who cannot be cross-examined and whose testimony need not be fully stated to the parties. The assessor is an expert whom the arbitrator may consult on the effect and meaning of technical evidence; he may in proper cases suggest to the arbitrator questions to put to an expert witness, and the arbitrator may ask him what inferences may properly be drawn from proved facts, or the extent of the difference between apparently contradictory conclusions of experts. Their lordships have now ruled that it is not part of his functions to conduct a personal examination of the workman, or to report to the arbitrator the effect of the examination and his deductions from it. The Lord Chancellor added that the arbitrator may, when faced with a conflict of medical evidence, submit the medical issue to the assessor as a referee, but then the report will be in writing and available to the parties. The medical referee is not, of course, exposed to cross-examination.

### CONSCIENTIOUS OBJECTION BY A HŌMEOPATH

The High Court dealt in January with an unusual appeal<sup>3</sup>: by a practitioner of homoeopathy against an order to serve as a junior medical officer, on the ground that he had a conscientious objection to giving "allopathic" treatment. Dr. Arthur George Davies of Cardiff was directed by a national service officer under Defence Regulation 58A to perform services in the United Kingdom as a junior medical officer at the Park Hospital, Wellingborough, for a period of six months. He failed to comply with the direction and was prosecuted before the stipendiary magistrate. At the hearing it was proved or admitted that he had a conscientious objection to giving "allopathic" treatment and that he would be required to do so. He was convicted of a breach of the regulations and fined £5 and £10 costs. He appealed, and the magistrate stated a case for the Divisional Court. Dr. Davies contended there that the

national service officer had not acted in good faith in directing him to perform services which the officer knew that he had a conscientious objection to giving, he having expressed his readiness to perform medical services on homoeopathic lines; he also pleaded that, being a homoeopath, he was incapable of performing the services he was directed to perform. The Ministry contended that the officer had acted in good faith and that a conscientious objection by the doctor was not a relevant matter of defence.

Mr. Justice Humphreys, giving the judgment of the court, said that while he had every sympathy for anyone called on to do anything that was in direct conflict with his convictions and beliefs, the decision of the magistrate was right. The court had to decide whether the officer's direction was lawfully given, and was bound to approach the case on the basis that he was a fair-minded person. It was for the officer to make up his mind whether a person called on to perform certain duties was "capable of performing" them. In the court's opinion the direction complained of was properly given and the doctor was a person capable of performing the duties required of him. His appeal was therefore dismissed.

By Regulation 58A any national service officer may direct any person in Great Britain to perform such services as may be specified by or described in the direction, being services which that person is, in the opinion of the officer, capable of performing. There is no appeal against a direction given by the officer, and conscientious objection is only recognized in connexion with service in the armed Forces. Dr. Davies's case was therefore not contemplated by those who framed the regulation. A question that comes to mind is: What have other homoeopathic practitioners done in similar circumstances? Without knowing the facts it is hardly proper to comment on the case.

## The Services

Capt. P. A. Forsyth, R.A.M.C., repatriated prisoner of war, has been mentioned in dispatches in recognition of gallant and distinguished services in the field before his capture.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Capt. (temp. Major) W. E. Tucker and Capt. A. D. Aveling, R.A.M.C., repatriated prisoners of war, in recognition of gallant and distinguished services during and before captivity; and also of Temp. Surg. Lieut. J. H. L. Ferguson, R.N.V.R., for gallantry and great skill in rescuing and caring for wounded survivors from H.M.S. *Croimart*.

### CASUALTIES IN THE MEDICAL SERVICES

*Previously reported missing at sea, now presumed to have lost his life.*—Lieut. R. A. Palmer, R.A.M.C.

*Missing, presumed killed.*—Temp. Surg. Lieut. P. G. Jeffries, R.N.V.R.

*Wounded.*—Temp. Surg. Lieut. J. C. Bulstrode, R.N.V.R.

### DEATHS IN THE SERVICES

Col. CHARLES EDWARD HARRISON, C.M.G., C.V.O., A.M.S., died on Jan. 25 at Redhill while in his 92nd year. He was the son of John Harrison, who was born in July, 1787, so the two lives span the remarkably long period of 157 years. The father, John Harrison, was appointed assistant surgeon to the First Foot Guards in 1809 and served during that year in the ill-fated Walcheren Expedition, and subsequently in the Peninsular War in 1811-13, in Holland in 1814, and at the Battle of Waterloo in 1815. In 1824 he was battalion surgeon, Grenadier Guards, and only retired in 1840. His distinguished son, Col. Charles Edward Harrison, was born in 1852 and was educated at Wellington College and St. Bartholomew's Hospital; he passed the London M.B. with honours in 1876 and took the F.R.C.S.Eng. in 1878, having first qualified as M.R.C.S. and L.S.A. in 1874. He entered the Army in the same year as surgeon to the Grenadier Guards, like his father just fifty years earlier. He rose to be surgeon-major in the same famous corps in 1885, was promoted to the now long-extinct rank of brigadier surgeon lieutenant-colonel, Brigade of Foot Guards, in 1891, and to brevet colonel in 1907. In the year of his retirement, 1909, he was awarded the C.V.O. His war service included the Battle of Tel-el-Kebir in Egypt in 1882 (medal with clasp and star) and a period in France during the last war in 1914-15, when, in addition to medals, he was given the C.M.G. During his long service he also held the important posts of charge of the Queen Alexandra Military Hospital, the 1st London General Hospital, and was Assistant Director of Medical Services; he was appointed Hon. Surgeon to King Edward VII. His energies after his retirement from active service included command of a convalescent hospital in 1916, work in the Ministry

<sup>1</sup> Richardson v. Redpath Brown and Co., Ltd., (1943) 1 All E.R., 110.

<sup>2</sup> Steele v. Robert George and Co., 1942) A.C., 497.

<sup>3</sup> Times, Jan. 13, 1944.

of National Service in 1918, and in the Territorial Force Reserve in 1918-23. It will be long before the Army medical record of himself and his father is equalled. The funeral took place on Jan. 28 at Redhill with full military honours. Major-Gen. O. W. McSheehy, represented the Director-General, Army Medical Services, and the Grenadier Guards sent an unarmed escort of pall-bearers with buglers who sounded the Reveille and Last Post.

## Medical Notes in Parliament

### Consultant and Specialist Services

Sir DOUGLAS HACKING inquired on Feb. 3 whether the Minister of Health had considered the letter about consultant and specialist services appearing in the *British Medical Journal* and the *Lancet* of Jan. 15, signed by the Presidents of the three Royal Colleges, which stated that these colleges were at his request making a survey of the present availability of consultants and specialists. Mr. WILLINK said he had considered this letter. Surveys of the hospital services had been in progress throughout the country for some months. Their aim was to assist in producing plans for the co-ordination of those services after the war by ascertaining the supply of and probable demand for hospital facilities, and by making recommendations for any necessary extensions and improvements. At an early stage of these inquiries it became clear that a useful purpose would be served by the initiation of similar inquiries in England and Wales into the supply and distribution of consultants and specialists and the probable demand for them in a comprehensive post-war hospital and consultant service. Arrangements were accordingly made with the Presidents of the three Royal Colleges for a survey to be made of the existing consultant and specialist services to ascertain whether there was a surplus or shortage in any area and whether redistribution would be desirable in any post-war hospital service. The Royal Colleges had established a Central Medical Academic Council, including representatives of the universities, to perform the necessary work at the centre, and area committees based on the universities to undertake the collection of information and preparation of lists locally. Mr. Brown had invited the vice-chancellors of the universities to act as chairmen of these area committees. It was hoped that this survey would make available for the first time information about the numbers and types of consultants and specialists in the country. Information was already to hand about specialists in the Services. Misunderstanding appeared to have arisen owing to the fact that to arrive at the numbers and types of consultants and specialists it was necessary to draw up lists of names. Mr. Willink said he was glad of the opportunity to assure the profession, and especially its members on war service at home or abroad, that such lists would be treated as strictly confidential. They would not be used as a test for eligibility for appointment as consultant or specialist in any comprehensive post-war hospital service. If, at a later date, it was thought desirable that consultant and specialist appointments should be restricted to persons qualified in some particular manner and enrolled in a list for the purpose, it would be necessary to provide for the establishment of a register on a statutory basis in a manner approved by Parliament.

### Post-war Housing

A debate on post-war housing took place in the House of Lords on Feb. 8 on a question by Lord ADDISON to the Minister of Works. Lord Addison asked what steps the Government was taking to meet requirements in regard to plans, designs, and costs and to alternative methods and materials.

Lord PORTAL said that on all housing matters he was working in complete accord with the Minister of Health, whose Department dealt with the local authorities, and also with the Secretary of State for Scotland. The Ministry of Reconstruction and the whole Government were alive to the vital necessity for getting on with the question of housing at the right moment, for it was largely a matter of timing in view of the fact that the war effort was still demanding nearly all the available labour and materials in the country. The limit of expenditure on repairs to war-damaged and other houses was recently raised from £100 to £500. Privately owned houses would participate in this, and the instructions to licensing officers had been adjusted accordingly. Local authorities should be able to secure the carrying out of the great proportion of these repairs, and the back of them should be broken by the end of the year. If that could be done, an awkward job would be out of the way. The Government had decided that in the late spring and early summer arrangements would be made for the use by local authorities of plant and machinery, as these

became available from airfield construction, for the preparation of housing sites sufficient for the maximum number of houses that could be built during the first two years after the war. Sites would be settled and approved between the local authorities and the Minister of Health. The Ministry of Works was putting up a number of houses to demonstrate the use of different materials in permanent house construction, and to ascertain the costs. The question of the suitability of the houses rested with the Ministry of Health. Experiments were being made in the conversion of wartime hostels into temporary houses. The Government had gone a considerable way in getting out plans for a type of temporary prefabricated house. In considering prefabrication on a large scale, the questions of materials and the capacity available for their manufacture were vital if it was to be started before the war was over. The first prototype (made by hand) would be ready at the end of April when it would be shown to the Minister of Health, the Secretary of State for Scotland, and others interested in the matter. To avoid these temporary houses remaining in existence as they did after the last war, the Government had decided that, if approved, they should be publicly owned and licensed for a period. The Ministry of Works was also exploring with certain local authorities the extent to which it would be economic and practicable to convert large houses in urban districts into comfortable flats. One of the most effective ways of securing efficiency and economy in houses would be by far greater standardization of essential parts than hitherto: already a degree of success in standardization had been achieved. For instance, the various sizes of metal windows had been reduced by about 80% to three basic types which could be produced in 20 varieties. The types of baths had been reduced from 40 to 5, and water heaters, tanks, and cisterns from 270 to 100. Other items were also being dealt with along these lines. They would try to give the people houses to live in at rents which they could afford to pay. Steps were being taken to ensure the supply of all materials required for post-war building. The report of the Mission which went to America was issued on Feb. 7, and would be of great value. The report of Sir George Burt's interdepartmental committee would, he hoped, be published next month. With regard to the post-war work, the Ministry was fully alive to what the ex-Service man wanted, and it would not be the fault of the various Departments concerned if they did not give him what he required.

**School Meals in Scotland.**—On Jan. 18 Mr. JOHNSTON informed Mr. Thomas Henderson that for October, 1943, the number of children receiving meals (dinners or lunches) in schools in Scotland was 159,364, representing 21.2% of the number on the rolls, compared with 141,630, or 18.8%, in June, 1943. The number receiving milk was 513,502, representing 67.6% of the numbers on the rolls, compared with 520,124, or 68.5%, in June, 1943.

**Infant Mortality in Scotland.**—On Feb. 8 Mr. JOHNSTON informed Mr. T. Henderson that the five counties and large burghs respectively in Scotland with the highest death rates among children between one and 12 months in 1941 were: counties: Selkirk, Ayr, Kincardine, Dumbaron, and Caithness; large burghs: Port Glasgow, Dumbaron, Coatbridge, Glasgow, and Hamilton.

**Calcium in Bread.**—On Feb. 8 Sir E. GRAHAM-LITTLE asked the Minister of Food whether, in view of the recent demonstration, details of which had been submitted to him, before a scientific society, that the added calcium was due to a misconception, if, as the increased consumption of calcium salts raised the blood pressure from which condition every fourth person of late middle age died, he would institute an inquiry on the subject independent of the Medical Research Council, and, until the findings of this inquiry were available, stop addition of calcium to bread. Col. LEWIS said he was not aware of the demonstration to which Sir E. Graham-Little referred. He was advised on the best authority that the small amount of calcium now added to bread was beneficial for the continued good health of the nation and had not the effects which the question would seem to imply. The answer to the second part of the question was "No, sir."

### Notes in Brief

The Disabled Persons (Employment) Bill, which has passed the House of Commons, was read a first time in the House of Lords on Feb. 8.

## Universities and Colleges

### UNIVERSITY OF CAMBRIDGE

At a Congregation held on Feb. 5 the degrees of M.B.; B.Chir. were conferred by proxy upon J. W. Evans, M. P. Durham, L. L. Bromley, B. W. Rhodes.

During the month of January titles of the degrees of M.B., B.Chir. were conferred on M. K. E. Reaney of Gorton College.

# MERSALYL B.D.H.

*The Standard Mercurial Diuretic*

Mersalyl B.D.H. complies with the pharmacopoeial standards defined in the First and Fourth Addenda to the B.P. 1932 for Mersalyl B.P. and Injection of Mersalyl B.P. respectively; it may be employed in the relief of a wide range of oedematous conditions.

The most satisfactory uses of Mersalyl B.D.H. are probably in cases of minimum renal insufficiency such as oedema of cardiac decompensation or indeterminate origin and in nephrosis and polyserositis. Certain cases of local oedema following fractures also respond satisfactorily.

Mersalyl B.D.H. is normally administered intramuscularly (Inj. Mersalyl. B.P.). Mersalyl B.D.H. in tablets (containing mersalyl 0.08 grm. and caffeine 0.04 grm.) or in suppositories (containing mersalyl 0.4 grm. and theophylline 0.2 grm.) may be given to augment the effect of Mersalyl B.D.H. by intramuscular injection.

*Details of dosage and other relevant information will be gladly supplied on request*

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A single application of benzyl benzoate emulsion, provided it is thorough, will usually cure a case of scabies. The chief advantage of benzyl benzoate over some other sarcopticidal agents is the rarity of dermatitis following its use and recently the formula of 'Ascabiol' has been modified so that skin irritation following its use is minimal.

Recent clinical work indicates that this pre-

paration is effective also as a pediculicidal agent. A pamphlet describing life history of *Sarcoptes scabiei*, the properties of different sarcopticidal agents and the technique of the treatment of scabies will be sent on request. Pads of instruction cards for patients are also available. 'Ascabiol' brand of benzyl benzoate emulsion is supplied as follows :—

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**PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LIMITED, DAGENHAM**

## Neurasthenia or Hypovitaminosis B<sub>1</sub>?

Many clinical manifestations, previously of doubtful ætiology, have been shown by modern vitamin research to be symptoms of hypovitaminosis. This applies notably to that protean group of symptoms the presence of which has so often led to the somewhat facile diagnosis, neurasthenia.

### RESPONSE TO VITAMIN THERAPY

The classical treatment of neurasthenia included rest in bed, reassurance and an abundant well-balanced diet. But, as one authority has aptly said, when cure resulted it was not the rest or the reassurance that effected it—it was the food. More accurately, in many cases it was doubtless the

Loss of appetite, ready mental and physical fatigue, anæmia, digestive disturbances, more or less vague aches and pains, and emotional instability—all these and other states which have been freely included in the picture of neurasthenia are now recognized as occurring in the presence of hypovitaminosis B.

### NATURAL SOURCE OF THE B COMPLEX

That a sub-standard level of vitamin B<sub>1</sub> is common is readily understandable, since the margin between average intake and physiological requirement of the vitamin is slim, and since the vitamin is not stored to any appreciable extent in the body.

A particularly convenient and effective means of ensuring that the daily intake of vitamin B for such patients is maintained at the optimal level necessary for the normal functioning of the body, especially

increased intake of vitamin B. Practical experience, indeed, has shown that loss of appetite, constipation, fatigue, instability and other elements of the so-called neurasthenic syndrome are often readily removed by increasing the daily intake of vitamin B, and particularly of vitamin B<sub>1</sub>.

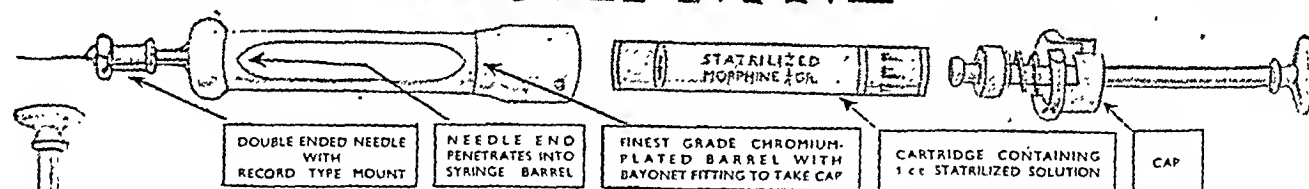
the nerves and gastro-intestinal tract, is the prescription of Bemax.

**BEMAX** supplies, at time of manufacture, approximately:

Vitamin A	280 i.u. per oz.	Vitamin E	8 mg. per oz.
Vitamin B <sub>1</sub>	240/420 i.u. ..	Magnesium	99 mg. ..
Vitamin B <sub>2</sub>	0.9 mg. ..	Phosphorus	330 mg. ..
P.P. factor	1.1 mg. ..	Iron	2.7 mg. ..
Vitamin B <sub>6</sub>	0.45 mg. ..	Copper	0.45 mg. ..

*Further particulars concerning Bemax from Vitamins Ltd. (Dept. B.E.), 23, Upper Mall, London, W.6.*

## STATRILIZED MORPHINE CARTRIDGES



- READY FOR INSTANT USE.
- IDEAL FOR EMERGENCY & A.R.P.
- SOLUTION PASSES DIRECT FROM CARTRIDGE TO PATIENT.
- EACH CARTRIDGE CONTAINS 1 c.c. STATRILIZED SOLUTION.

Statrilized Solutions of Morphine are self-sterilising and stable, with the added advantage of lessened toxicity. Statrilized Morphine may be used in exactly the same dosages as ordinary morphine solutions.

### CARTRIDGE SYRINGES & NEEDLES

**1 c.c. SYRINGE** (as illustrated) per 10/- syringe  
Needles for above, in boxes of 3, G.25, 1 in. long, stainless steel per 2 6d. box

**2 c.c. SYRINGE** to take cartridges of Novutox self-sterilising Local Anaesthetic and also 1 c.c. cartridges statrilized Drugs. per 20/- syringe

Needles for above, stainless steel, 1 in. or 1½ in. long, G.26, tubes of 12 needles per 4/- tube

Each c.c. of statrilized solution contains, in addition to the stated drugs, 0.00002 gm. capryl hydrocupreinotoxin hydrochloride.

### STATRILIZED DRUGS AT PRESENT AVAILABLE

STATRILIZED DRUGS	CARTRIDGES 20 x 1 c.c.	AMPOULES 12 x 1 c.c.	BOTTLES 12 c.c. 24 c.c.
Morphine ½ gr. per c.c. .. .. ¼ gr. per c.c. .. .. ½ or ⅓ gr. per c.c. ..	9/- 9/3d. 10/6d.	4/9d. 5/- 5/9d.	3/4d. 3/6d. 4/- 4/6d. 4/9d. 5/6d.
Morphine ½ gr. per c.c. cum Atropine 1/150th gr. per c.c. .. }	10/4d.	5/7d.	3/11d. 5/4d.
Morphine ½ gr. Strychnine 1/60th gr. } Atropine 1/100th gr. per c.c. .. }	10/4d.	5/7d.	3/11d. 5/4d.

PHARMACEUTICAL MANUFACTURING CO., LTD.  
The Laboratories, Cheltenham, Glos.

No. 4

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital statistics in the British Isles during the week ended Jan. 29.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for (a) England and Wales, London included, (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded as due to Infectious Diseases for (a) The 126 great towns in England and Wales, including London, (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases. A blank space denotes disease not notifiable or return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
cerebrospinal fever										
Deaths			14	2	2	113	12	2		
diphtheria	77	28	171	152	31	809	32	28	47	48
Deaths	19	6	6	1	1	24	1	6		
dysentery	176	27	56		1	178	1	24		
Deaths										
encephalitis lethargica										
acute	1	1				5	1			
Deaths										
typhoid			62	4	3			58	14	3
Deaths										
infective enteritis or diarrhoea under 2 years										
Deaths	48	10	12	6	2	33	3	8	2	3
scarlet	919	153	116	159	11	12,001	521	322		1
Deaths	1					17	3	2		
rhathus neonatorum	65	42	24			104	5	20		1
Deaths										
typhoid fever	4		2			33		1		
Deaths										
pneumonia, influenza* (from influenza)	1,079	88	35	19	11	1,528	89	27	3	4
Deaths	104	16	6	2	1	125	18	7		
pneumonia, primary			276	7			363	20		
Deaths	71		20	12		61		17	14	
bio-encephalitis, acute	2					1				
Deaths										
typhoid fever	4		2			10		2	4	
Deaths										
perpetual fever	7	16				1	17			
Deaths										
perpetual pyrexia	167	10	12	4	1	162	5	16	2	1
Deaths										
typhoid fever	1,928	138	217	26	71	2,272	153	357	36	50
Deaths	3					5		2		
allpox										
Deaths										
phoid fever	2	1	2	16	5	6		4	7	
Deaths										
phus fever										
Deaths										
whooping-cough	2,104	177	133	64	15	1,790	104	119	58	3
Deaths	13	3	2	3	1	12	2	3	1	
infants (under 1 year)	453	67	69	61	20	416	49	77	43	26
annual mortality rate (per 1,000 live births)										
aths (excluding stillbirths)	5,346	840	723	282	137	5,449	823	717	232	148
annual death rate (per 1,000 persons living)			16.6	18.4	4			16.2	15.3	4
e births	6,747	851	888	411	280	6,232	728	908	401	265
annual rate per 1,000 persons living			18.1	26.8	4			18.5	26.4	4
lbirths	220	25	35			242	22	41		
rate per 1,000 total births (including stillborn)			38					43		

Includes primary form or England and Wales, London (administrative county), and Northern Ireland.

Includes puerperal fever for England and Wales and Eire.

Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales during the week the incidence of measles went up by 258, of diphtheria by 65, and of dysentery by 28 cases. There were 182 fewer notifications of scarlet fever, 111 of whooping-cough, and 43 of acute pneumonia.

The 104 deaths from influenza recorded in the large towns represent a decrease of 39. Deaths in Greater London fell from 54 to 39.

Measles appears to have begun its seasonal rise: notifications have increased from 515 to 919 during the past month and are now at the highest level for twenty-one weeks. The only rises of note during the week were in Lancashire by 68, London by 35, and in Durham by 28 cases. The rise in diphtheria was due mainly to Yorks West Riding 30 cases more, and Lancashire 27 more. Scarlet fever was less prevalent in the south-eastern and south midland regions: there were 43 fewer cases in Surrey. Whooping-cough notifications were down by 29 in Essex and by 28 in Lincoln. The only notable difference in the notifications of acute pneumonia was a decrease of 53 in London.

The one fresh outbreak of dysentery during the week was in Denbighshire, Colwyn M.B. 14. In Middlesex notifications rose from 11 to 27; in London they fell from 41 to 27. In the other established large outbreaks the incidence remained unchanged: Kent 20, Lancashire 20, Surrey 12, and Yorks West Riding 10.

In Scotland notifications of whooping-cough fell by 100, acute primary pneumonia by 24, measles by 22, and dysentery by 13; there were 31 more notifications of scarlet fever, due to the experience of the western area. Dysentery in Edinburgh increased from 7 to 19 cases, the only other large centre of infection being Fife county, with 11 cases.

In Eire diphtheria increased from 110 to 152 cases. The incidence was widespread, the largest returns being Dublin C.B. 33, and Co. Carlow, Carlow U.D. 27.

In Northern Ireland relatively large declines were recorded in the incidence of scarlet fever by 28, and of diphtheria by 20.

## Tuberculosis Figures

Mr. Willink furnished on Feb. 10 the following comparative figures for all forms of tuberculosis:

Year	Deaths from Tuberculosis		Notifications of Tuberculosis	
	England and Wales	Scotland	England and Wales	Scotland
1938	26,176	3,431	58,093	7,568
1939	25,623	3,526	53,835	7,097
1940	28,144	4,003	54,929	7,722
1941	28,670	4,174	59,976	8,294
1942	25,547	3,998	69,732	9,048

## Week Ending February 5

The returns of infectious diseases in England and Wales during the week included: scarlet fever 2,032, whooping-cough 2,116, diphtheria 733, measles 1,162, acute pneumonia 1,115, cerebrospinal fever 71, dysentery 161, paratyphoid 9, typhoid 5. Influenza deaths in the great towns numbered 78.

## Points from Abroad

According to Heismeyer (*Disch. med. W'schr.*, 1943, 69, 667) an attempt to rehabilitate the tuberculous alongside of the non-tuberculous was unsuccessful at Hohenlychen, even when the former were non-infectious. In spite of talks by doctors and others, the healthy workers had too great a fear of infection to tolerate the presence of the tuberculous in the workshops. Investigation of large numbers of people by means of x rays continues. Out of the cases of tuberculosis discovered in this way among 6 million people in Westphalia it was found that only 33.9% of those with active disease had previously been known to the health authorities as tuberculous.

Influenza has been prevalent in Denmark. In the second week in January there were 3,000 cases—mostly of a mild character—in Copenhagen.

Tins of sweetened condensed milk now contain 14 oz. and of unsweetened 16 oz., and the four-weekly allowances, free of points, for infant feeding have therefore been adjusted as follows: for children under 5 months up to 10 tins of the sweetened or up to 18 tins of the unsweetened milk; children 5 to 6 months inclusive 11 tins or 21 tins respectively; up to 9 months 12 or 23 tins, and 10 to 12 months 13 or 24 tins. It is assumed that 2½ tins of sweetened or 5 tins of unsweetened condensed milk will be available each 4 weeks on the infant's points ration.



## INCOME TAX

## Claims for Support of Mother and Brother

J. F.'s mother is a widow with a very small income and he sends most of his earnings to her for her support and for the education of his younger brother. What claim can he make?

\* He can claim an allowance of £50 if he "maintains" his mother, but that amount is reduced by £1 for every £ by which his mother's income exceeds £50.

## Enforced Removal

A. R.'s premises were bombed and he was compelled (a) to remove furniture to new premises, and (b) to buy new furniture, etc. Can he charge these expenses?

\* (a) Yes. (b) He can charge the cost of replacement in so far as it was not covered by insurance or other indemnities. (The answer of course applies to professional equipment.)

## Replacement of Cooker in Nursing Home

F. C. explains that in 1942 the kitchen range in her nursing home required replacement. A range similar to the old one was unobtainable, and an "Aga" cooker was installed. The inspector of taxes has restricted the allowance to F. C.'s share of the estimated cost of replacing the old range with a similar one.

\* The inspector is right in principle; the element of improvement represents capital outlay. On the other hand the estimate of £20 for the cost of replacing the old range with a similar one may be insufficient. We advise F. C. to press for a substantial increase and, if necessary, to obtain an estimate from a local builder on the point.

## Accommodation Provided on Crown Premises

C. G. is supplied with a bedroom and a sitting-room in a Ministry of Pensions hospital. The annual value of the rooms is estimated at £19 10s., and the inspector of taxes proposes to bring this amount into assessment under Schedule A as from April, 1941. Is this correct?

\* Yes—assuming that C. G. has had the use of the accommodation since April, 1941, and that the premises belong to the Crown. The liability arises because the exemption conferred on premises "belonging to the Crown" does not extend to "apartments . . . in the occupation of any officer of the Crown by right of his office or otherwise."

## Expense on Taking Over a Practice

"M.B., Ch.B." recently purchased a practice and inquires as to the allowance for (a) cost of removal from the town where he had been acting as a locum, (b) legal and other expenses in connexion with the purchase of the premises of the new practice, and (c) effecting some structural alterations to reduce domestic work and thereby free his wife for assistance in the practice.

\* (a) and (b). No deduction can be claimed for these expenses; they represent capital expenditure in order to carry on the practice. (c) This also falls under the ban as capital expenditure, but any reasonable amount paid to the wife for her assistance in the practice can be deducted.

## Service in the Forces: Professional Expenses

W. H. and J. N. M. inquire as to the allowance against Government pay for expenses incurred in the form of subscriptions to professional societies, and in replacing out-of-date medical books.

\* Official pay is assessable under Schedule E, and the rule with regard to expenses is that to be allowable they must be incurred wholly, exclusively, and necessarily in the performance of the duties of the office. If the employer—in the case of ordinary non-Government employment—requires his assistant to be a member of the B.M.A., for instance, then payment of the subscription is a "necessary" expense of that employment and the amount can be deducted. Such a requirement, however, does not apply to Government service, and neither is an officer required to maintain his medical books up to date, and consequently such expenses fall under the ban of the restrictions and rigid rule quoted above.

## "Pay as you Earn"

A. B. inquires whether the new system of deducting tax will apply to payments he makes to a married woman acting as locum for an absent partner. Her remuneration is £550 a year with car and all living expenses.

\* Yes. As from April 5 all individuals holding an office or employment will come within the new arrangements, whatever the amount of the remuneration.

## LETTERS, NOTES, ETC.

## Local Antiseptics

Mr. W. DOUGLAS PARK (London Hospital) writes: The use of sulphonamides, proflavine, and now penicillin has shown that local use of antiseptics is both justifiable and desirable. For years I have been using potassium permanganate solution as a local application on varicose ulcers. It is, of course, far from new as an antiseptic, but very few people seem to use it, and all have been impressed and usually rather surprised at its success when they do so. I use a 1 in 2,000 solution applied once or twice a day, even more often, and find that it produces a clean granulating wound in a remarkably short time in practically all cases. It has the notable characteristic of greatly diminishing the extremely unpleasant smell of these ulcers. I have found the solution useful on many other dirty wounds besides varicose ulcers, particularly chronic osteomyelitis following compound fractures. I write this short letter as I think it may prove helpful to others who may not have thought of using it.

## Treatment of Coryza

Dr. RUTH HUNTER (Sandwich) writes: Referring to Dr. Piney's letter (Jan. 29, p. 163) on the treatment of coryza with argyrol and argyrol in normal saline, and pointing out the instability of a solution containing these components, I should like to mention that a stable solution, isotonic with, or, to use a more homely term, "comfortable" to, the nasal mucous membrane and non-crust-forming, can be made by prescribing a 10% solution of argyrol in quarter normal saline. Ephedrine may be used if necessary five minutes before the argyrol to reduce congestion and so permit a more effective permeation of the argyrol in the nasal passages. The use of a spray is more effective and convenient than that of a dropper.

## Infusion of Fluid by Sternal Puncture

Dr. A. P. HARDMAN writes: I was most interested to read Mr. Hamilton Bailey's article (Feb. 5, p. 181) on the infusion of fluid by sternal puncture. In 1941 I saw the method very ably demonstrated by Dr. Mabel E. Carmer of New York State on an infant suffering from severe marasmus which was under my care. The extreme dehydration in this case had rendered intravenous infusion practically impossible. There is no doubt that this method of infusion can be of great value in such cases. I feel grateful to Mr. Hamilton for his clear review of what had appeared to me an unorthodox yet most rational method of administering fluids.

## War in the Nursery

The HON. SECRETARY of the National Society of Children's Nurseries writes: We see stated in your issue of Jan. 8 (p. 50) that in the war nurseries there is "a high incidence of infection and a low incidence of happiness." As a society we consider that this is a very grave allegation to make. It is a dangerous one to put forward at a time when the Government has found it necessary to make nursery provision for children of women whose work is essential to the effort to end the war. Such an allegation seems to us to be grossly exaggerated and needs to be substantiated. Surely it would have been more useful to influence those responsible to improve conditions in the nurseries which Dr. Helen Mackay has investigated. The power of your readers is immense if they wish to be assured that children are properly cared for in any nursery set-up. This society would welcome an expression of such determination from the doctors.

## Supplies of Iodine

The IODINE EDUCATIONAL BUREAU writes: May we point out an error of fact in the interesting article on "Skin Disinfection" in your issue of Feb. 5? Iodine is not, as stated, in short supply at present. The reserve stocks in this country are entirely adequate to meet all requirements for some years. In its memorandum "Economy in the Use of Drugs in Wartime," the Therapeutic Requirements Committee of the Medical Research Council placed iodine in the category of drugs essential for certain purposes but not for others and in the use of which economy should be observed. It added the essential qualifying note, however, that adequate supplies are available and that the need for economy relates to alcoholic solutions. We are aware of the importance of conserving supplies of alcohol at this time and have been working towards this end by advocating aqueous instead of alcoholic solutions of iodine—a policy endorsed by the Therapeutic Requirements Committee. Incidentally, the germicidal value of the aqueous iodine solution is superior to that of the so-called "tincture"—a fact demonstrated by Claudius so long ago as 1902 and confirmed many times since, notably by such masters in the field of disinfection as Bulloch (1929) and Colebrook (1941).

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 26 1944

## FAINTING IN BLOOD DONORS

REPORT TO THE MEDICAL RESEARCH COUNCIL PREPARED BY A SUBCOMMITTEE OF THE BLOOD TRANSFUSION RESEARCH COMMITTEE\*

The bleeding of donors that has taken place to meet war-time needs for blood and blood derivatives has aroused interest in the cause and nature of the faint that may occur during or after the donation of blood (Brown and McCormack, 1942; Greenbury, 1942; Poles and Boycott, 1942; Williams, 1942). If such faints could be prevented the work of the Transfusion Service would be facilitated, as, apart from the discomfort they cause the donor, they delay the bleeding procedure. Further, a faint may occur (Poles and Boycott, 1942) when the donor has returned to work, resulting in possible serious consequences where machinery is concerned. Two investigations were therefore instituted: (I) to identify factors that may be associated with fainting during blood donation, with a view to their correction, (II) to determine the frequency of delayed faints.

### I. FACTORS ASSOCIATED WITH FAINTING IN BLOOD DONORS

The inquiry into the possible factors associated with fainting was carried out between the months of May and August, 1942, in a number of bleeding centres in England and Scotland. Although the actual details of bleedings vary with the locality, the general procedure approximates to that previously described (Brown and McCormack, 1942). The fact that a card had to be filled in for the donor studied may have slightly slowed down the routine in some instances.

To measure the actual frequency of fainting in different classes of donors—e.g., men and women, the young and old, manual and clerical workers, etc.—it would be necessary to collect details of every person bled, whether fainting or not fainting (or at least of a large sample). The fainting rate—i.e., number fainting divided by number bled—could then be calculated for each class. The resulting figures would show whether there were any appreciable differences in incidence between the classes, and whether, therefore, it would be wise to reject certain types of donors as being too subject to fainting. This method of inquiry would, however, have placed a heavy strain on the centres by asking them to supply detailed information about large numbers of donors. It would have severely limited the number of questions that could be asked about the donor, so reducing the value of the inquiry.

As an alternative method of investigation the following scheme was adopted (see accompanying Record Card). The centres were asked to complete a card for (a) every donor who fainted during a bleeding procedure; (b) for the next donor bled by the same person. By this means the characteristics of those persons who fainted could be compared with the corresponding characteristics of an unselected group who did not faint. The data should show whether certain characteristics appear with a materially greater frequency in the fainting group

than in the non-fainting, and thus answer the main question at issue—viz., are certain features significantly associated with an increased incidence of fainting?

### MEDICAL RESEARCH COUNCIL: BLOOD TRANSFUSION RESEARCH COMMITTEE

#### FAINTING IN DONORS

Name of person who bled donor (Block letters) ..... Postal address of place of bleeding .....  
Date of bleeding ..... c.m.

#### Data concerning Fainters and Controls

- |   |   |
|---|---|
| 1. Name of donor ..... (Block letters)    | 10. Was the free flow of blood achieved |
| 2. Age last birthday.....                 | (a) without difficulty.....             |
| 3. Sex: M or F.....                       | (b) with difficulty.....                |
| 4. Occupation.....                        | (c) with accompanying haemato-          |
| 5. Does donor stand or sit at work? ..... | 11. Quantity of blood withdrawn.....    |
| 6. Time of donor's arrival ..... a.m.     | 12. Time of last ordinary meal.....     |
| at depot..... p.m.                        | 13. Time of any intervening snack.....  |
| 7. Time of venepuncture ..... a.m.        | 14. Menstruation: present.....          |
| 8. Time of finish of bleeding ..... p.m.  | or when due.....                        |
| —i.e., withdrawal of ..... a.m.           | 15. Number of times previously          |
| needle ..... p.m.                         | bled.....                               |
| 9. Time of donor's departure ..... a.m.   | 16. Number of previous faints con-      |
| from depot ..... p.m.                     | 17. History of fainting not connected   |
|   | with blood donation.....                |

#### Data concerning Fainting Attack

18. Describe stage of bleed .....  
19. Time at which attack .....  
20. Underline those symp-  
toms: .....  
dizziness, blurring of vision, sweating, feeling of cold, nausea, vomiting,  
loss of consciousness, convulsions.  
21. Description of any other symptoms.....  
22. Any other observations regarded as relevant.....

Signature.....  
(Depot Director or Regional Transfusion Officer)

#### Definitions

A donor was regarded as having "fainted" if any of the symptoms or signs usually associated with fainting were shown (Brown and McCormack, 1942) and the severity necessitated a delay or alteration in the normal procedure. A list of such symptoms or signs was given (Question 20), ranging from the slight, such as a feeling of warmth, pallor, or dizziness, to the severe, such as vomiting, loss of consciousness, or convulsions. The expression "faint" or "fainting" in the tables and discussion that follow must always, therefore, be read in this sense. The great majority of faints comprised more than one of these signs or symptoms.

The bleeding procedure for which each record was required was the course of events from the donor's arrival at the centre until his or her departure. The incidence of fainting therefore deliberately omits those cases in which the faint took place after the donor's departure from the centre: these are the subject of the second investigation recorded here.

As already stated, the non-fainting donor who was to serve as a control to the one fainting was to be the next donor after

\* The thanks of the subcommittee are due to the Depot Directors and Regional Transfusion Officers of England and Scotland who collected the data which form the basis of this report and to Dr. Bradford Hill for carrying out the statistical analysis.

the faint who was bled by the same person. In the event of this control also fainting the next two cases were taken as controls. No departures from this rule were allowed. In fact, the centres did not invariably find it possible to provide the control case required. For example, the last donor bled by a particular bleeder on a given day may have fainted, so that no subsequent case was available. The discrepancy is not likely to affect the comparisons materially, since there were, in all, 335 control cases to 362 faints—not a serious departure from the required equality.

### Reliability of the Sample

Some check on the reliability of this sampling procedure is possible. It will be seen from the record card that certain times were asked—to show how long the donor had been at the centre before the faint occurred, etc. As it was, of course, impossible to foretell which donor would faint and which would not, it was necessary to keep a time sheet for every donor. This information was therefore available for the whole "population" of donors as well as for the samples of fainters and controls: the time sheets were returned by two of the largest centres. In the one (Centre S) the number of donors was 3,345, and cards were completed for 181 faints, giving a fainting rate of 5.4%. In the other (Centre M) the number of donors was 1,864, and cards were completed for 107 faints, giving a fainting rate of 5.7%. Applying these ratios to the various times recorded on the sample cards gives an estimate based upon the sample of the average time spent at the centre by the whole population. (For example, the average length of wait at the centre before bleeding was 14.2 minutes for the controls and 13.1 minutes for the fainters. As fainters were 5.4% of the total the average length of wait for the whole population can be estimated from the sample as  $(13.1 \times 5.4) + (14.2 \times 94.6) \div 100$ , or 14.1 minutes.) These values can be compared with those recorded on the time sheets for all the donors, and they give the results shown in Table I.

TABLE I

	Centre S		Centre M	
	From Time Sheets	Estimated from Sample	From Time Sheets	Estimated from Sample
Average length of wait (minutes) at centre before venepuncture	14.9	14.1	15.7	15.6
Average length of wait (minutes) at centre after venepuncture	24.1	25.9	32.6	32.3
Average length of time (minutes) between arrival and departure	43.9	47.9	52.9	53.4

The agreement is good, and shows that in this respect the samples give a correct picture of the "universe," and may therefore be accepted as likely to be satisfactory for the analysis of other features.

### Results

The results were analysed in four groups. Three groups—L, M, and S—each represented the donors bled at one particular centre, while the fourth (O) included the cards returned in small numbers from many different centres. Except when striking differences were observed between the different centres only the combined figures are recorded here.

1. *The Incidence of Fainting.*—The incidence was shown in a previous paragraph to be 5.4% of donors at S and 5.7% at M. For the other groups the information regarding the total number bled was not available. It may be noted that the incidence as defined in this inquiry must in part be affected by the length of time the donor is kept at the place of bleeding, since faints occurring after departure were classified as delayed and not included. The longer the donor is kept, the higher, therefore, may be the recorded rate, and vice versa.

2. *Sex and Civil State.*—Comparison of the sex and civil state of the control and fainting groups is shown in Table II. It will be seen from this that men are slightly under-represented in the fainting group, single women approximately equally represented in both groups, and married women slightly over-represented in the fainting group. The numbers involved are such that these differences between the controls and fainters are not more than might fairly easily be due to chance. However, this slight deficit of men and slight excess of married women in the fainting group was found on

detailed analysis to be a feature of each of the four separate bleeding centres. It is possible, therefore, that the difference, though certainly small, is real, and that, regarding single women as having an average fainting rate, men have a rate rather below and

TABLE II

	Number of Donors		Percentages	
	Controls	Faints	Controls	Faints
Men .. ..	98	88	29.3	24.3
Single women ..	101	105	30.1	29.0
Married women ..	136	169	40.6	46.7
Total .. ..	335	362	100.0	100.0

married women a rate rather above average. For one centre (M) it was possible to calculate the actual fainting rates for the sexes separately from the time sheets. They were found to be 3.9% in 361 men bled and 6.2% in 1,503 women, a difference of  $2.3 \pm 1.2$ . Again the difference is not technically significant, but suggests a lower rate of fainting amongst men.

3. *Age.*—The effects of age are shown in Table III.

TABLE III.—Percentages in Each Age Group

Age	Men		Single Women		Married Women		Total	
	Controls	Faints	Controls	Faints	Controls	Faints	Controls	Faints
Under 24 ..	15.5	20.5	46.0	45.7	11.9	8.9	23.2	22.4
25-39 ..	51.5	47.7	34.0	33.0	46.7	54.5	44.3	46.7
40 and over ..	32.9	31.8	20.0	20.9	41.5	36.7	32.5	30.9
Mean age	36.9	34.7	30.2	30.7	39.3	39.5	35.9	35.8

There is clearly no evidence in these returns that age is a factor of importance. The faints are spread over the whole span of ages represented, and the proportions at different ages are close to those shown by the control group. The mean ages of the two groups are nearly identical for men and women, single or married.

4. *Occupation.*—In studying the incidence of fainting in persons differently employed it was possible to divide the donors into three groups only—namely, those on clerical or similar work, those employed on factory jobs, and the remainder as a mixed group. At all ages combined the figures are shown in Table IV.

TABLE IV.—Percentages of Faints according to Occupation

Type of Work	Men		Single Women		Married Women	
	Controls	Faints	Controls	Faints	Controls	Faints
Clerical ..	32.7	31.8	34.7	48.6	10.3	6.5
Factory ..	31.6	34.1	27.8	23.8	12.5	14.8
Other ..	35.7	34.1	37.6	27.6	11.8	16.0
Housewives ..	—	—	—	—	65.5	62.7

There is no appreciable difference between the work of the controls and faints in men and married women, but we find an excess of clerical workers among the single women who faint which is just statistically significant ( $+ 13.9 \pm 6.8$ ). The results when subdivided by age give small numbers and record no consistent differences between the controls and faints except that, though apparent in all age groups, the high incidence in clerical workers among unmarried women is most apparent over the age of 35. In the question of relating to the donor's occupation it was also asked whether he or she sat or stood at work. In a number of cases there was, as would be expected, no simple answer, for certain jobs involve some sitting and some standing. The analysis was therefore directed towards enumerating those in the different groups who replied that they stood at their work. With men and married women there was no material difference between the control and fainting groups: 50% of the male controls and 48% of the faints stood at their work. With married women the corresponding percentages were 43 and 49. With single women a rather lower proportion of the fainters stood at their work—24%, against 36% of the controls, a difference which clearly follows from the higher incidence of fainting in the clerical workers in this group. Excluding these workers, few of whom stood at their work, a comparison was made of factory workers, shop assistants or managers, and all otherwise employed. The differences between the controls and the fainters are negligible in each group, the total for the three groups giving 50% of the controls and 57% of the fainters standing at their work. There is no evidence, therefore, that posture has any bearing upon the probability of fainting at blood donation.

5. *Length of Wait before Bleeding.*—It is possible that the length of time the donor waits before bleeding might affect the chances of fainting. Too long a wait might possibly be a disadvantage to the

nervous individual. On the other hand, under observations regarded as relevant it was occasionally stated that a donor who fainted had hurried to the centre, the inference presumably being that he or she arrived hot or tired, a condition which might have been corrected by a longer wait before bleeding. Table V shows, however, that the distribution of times of waiting and the mean time differs immaterially between the controls and the fainters.

TABLE V

Length of Wait before Bleeding (minutes)	Percentages	
	Controls	Faints
Under 10 .. ..	49.7	50.8
10-19 .. ..	26.6	27.2
20-29 .. ..	12.3	10.6
30-39 .. ..	5.4	6.7
40-49 .. ..	2.4	3.1
50-59 .. ..	3.6	1.7
Mean length of wait:		
Men .. ..	13.8	12.7
Single women ..	15.0	14.4
Married women ..	14.6	14.2
Total .. ..	14.5	13.9

On the average the fainters had been kept waiting a very slightly shorter time than the controls, but the difference is of the order of but half a minute. (It might, of course, be due to a slight delay occurring after a faint before the bleeding of the next donor.)

6. *Length of Time between Last Meal and Bleeding*.—There is no evidence from the data collected that a long interval since a meal may appreciably increase the incidence of fainting (Table VI).

TABLE VI

Length of Time since Last Ordinary Meal (hours)	Percentages	
	Controls	Faints
Under 1 .. ..	2.1	4.0
1 .. ..	22.2	22.0
2 .. ..	26.7	27.1
3 .. ..	18.5	17.5
4 .. ..	14.9	11.9
5 .. ..	7.1	7.1
6 .. ..	2.7	2.8
7 .. ..	3.1	3.1
8 .. ..	0.3	0.3
9 .. ..	—	0.3
10 or over ..	4.0	4.2
Mean interval:		
Men .. ..	3.1	3.3
Single women ..	3.6	3.7
Married women ..	3.6	3.4
Total .. ..	3.5	3.6

There is a small excess of long intervals in the fainting group—10.4% over 6 hours, compared with 8.2% of the controls—but more observations would be necessary to determine its significance. The average intervals for each sex differ inappreciably between fainters and non-fainters, being 3.5 hours for the controls and 3.6 hours for the fainters.

A further question related to the time at which any intervening snack was eaten, so that calculation should be made of the interval between bleeding and the last consumption of any food—i.e., back to the time of the snack or, if none had been eaten, to the last ordinary meal. Again the distributions of intervals and the average intervals are strikingly similar. For the total observations the average times were 2.4 hours for the controls and 2.5 hours for the fainters, and there is equally little difference in the subdivisions by men and women, married or single. But, as with the intervals since the last ordinary meal, there is a hint that too long a time may play a part in a small number of cases, for 1.8% of the controls and 3.3% of the fainters had had no food for at least six hours.

7. *Menstruation*.—In Table VII is shown the position of the date of bleeding in relation to the woman's position in the menstrual cycle. No appreciable differences between the controls and fainters are apparent. Of the former 18% and of the latter 19% were past the menopause, and are excluded together with a small number who gave no information or who were stated to be irregular in their interval. Only a relatively small proportion of women present themselves for bleeding during menstruation, and this proportion differs negligibly between the two groups. The majority come to be bled in the latter half of the cycle (menstruation due within 1-14 days), and only about half as many in the first half of the cycle (menstruation due in 15-28 days, or 1-14 days past the previous menstrual period). Here there is a difference of some magnitude between the controls and the fainters, for of the former 9.2% and of the latter

15.8% had recently completed a menstrual period. The difference is just statistically significant ( $6.6 \pm 3.3$ ), and suggests that the later part of the menstrual cycle is a more favourable time for bleeding than the earlier part.

TABLE VII

Menstruation*	Percentages	
	Controls	Faints
Present .. ..	8.2	9.1
Due now .. ..	4.3	3.8
In 1-7 days ..	29.0	25.4
" 8-14 .. ..	31.0	28.7
" 15-21 .. ..	17.4	17.2
" 22-28+ .. ..	9.2	15.8

\* Many intervals were recorded as exactly one week, two weeks, three weeks, † Including cases recorded as just finished.

8. *Difficulties Occurring in Bleeding*.—In the vast majority of cases—92% of the controls and 90% of the faints—free bleeding was achieved without difficulty. There was haematoma formation in 2.4% of the controls and in 1.9% of the faints; bleeding was unsuccessful in 0.6% and 0.8% and difficulties in securing a free flow occurred in 4.9% and 6.9% respectively. Though such difficulties may therefore have possibly contributed very occasionally to the occurrence of a faint they cannot be important in the general incidence.

9. *Number of Previous Bleedings and Associated Faints*.—There was in each group a slight excess of fainters whose blood donation was their first. The combined figures are shown in Table VIII.

TABLE VIII

No. of Previous Bleedings	Percentages		Ratio F/C
	Controls	Faints	
0 .. ..	47.9	54.1	1.13
1 .. ..	36.2	33.9	0.94
2 .. ..	11.0	8.4	0.76
3 or more ..	4.9	3.7	0.76

It is apparent that, while there is a slightly higher risk of fainting at a first donation, nearly half the fainters had been bled previously, some of them an appreciable number of times; previous uninterrupted donations are therefore no guarantee of similar success on a later occasion. On the other hand, it will be seen (Table IX) that a faint at the bleeding recorded was often associated with previous faints at blood donation.

TABLE IX.—Percentage of Previous Donations that were Associated with a Faint

	Controls	Faints
Men .. ..	1.3	29.7
Single women ..	8.4	42.9
Married women ..	2.1	35.1
Total .. ..	2.8	35.9

10. *History of Fainting not Associated with Blood Donation*.—Fainting not associated with blood donation was also reported far more frequently in those who had fainted at the bleeding under discussion than in the controls. Only 45 (13%) of the 325 controls gave a history of such fainting, against 159 (44%) of the 362 fainters—a difference of  $31\% \pm 3.2$ . It is of course possible that the occurrence of the faint at bleeding would lead the donor to remember or emphasize any previous history—more so than the donor whose bleeding was uneventful. While such a tendency would exaggerate the difference between the groups, it seems likely that much of that difference is real. The causes, for instance, to which previous fainting unconnected with bleeding was attributed show that the fainters referred much more often than the controls to a positive history in association with hospitals, minor surgical procedures, and slight accidents or injuries to the subject or others (9 of the controls to 47 of the fainters). Susceptibility to such influences would clearly be likely to tell against a successful bleeding.

11. *The Stage of Bleeding Procedure at which the Faint Took Place*.—Taking all the records together, a small proportion of the faints (2%) occurred at venepuncture or almost immediately; approximately a quarter (23%) started during bleeding; a third (34%) fell close to the time of withdrawal of the needle, with a further 16% following shortly afterwards; and the remaining quarter (25%) occurred during the final period of rest and recovery. The data were, however, not always easily interpreted. There are quite large recorded differences between Centre S and the other three centres. The former shows a much lower proportion of fainting in

the period of recovery and a much higher proportion at withdrawal of the needle. The figure in the final stages might well be related, as already pointed out, to the length of time the donor is retained at the centre; but, with the exception of L, this time did not vary appreciably. The average length of time the normal donor was kept resting-after bleeding was approximately 25 minutes at S and O, half an hour at M, and just over a quarter of an hour at L. No explanation in terms of these varying times seems possible, and there is nothing else in the available data to offer one.

12. *Symptoms shown by Fainters.*—The relative frequency with which various symptoms were noted in the fainting donors is shown in Table X (more than one symptom was usually recorded, so that the faint is entered under one or more headings).

TABLE X.—Percentage Frequency with which Various Symptoms were Observed. (Total No. of Faints, 362—Men 88, Women 274)

Symptom	Men	Women	Total
Feeling of warmth .. ..	73	62	65
Restlessness .. ..	17	14	15
Epigastric discomfort .. ..	25	25	25
Pallor .. ..	85	84	84
Dizziness .. ..	60	64	63
Blurring of vision .. ..	16	21	20
Sweating .. ..	80	50	57
Feeling of cold .. ..	14	14	14
Nausea .. ..	22	31	28
Vomiting .. ..	8	10	9
Loss of consciousness .. ..	16	12	13
Convulsions .. ..	7	8	7

Except for a higher incidence of warmth or sweating in males and somewhat more frequent complaints of nausea in women, there is little difference between the symptoms observed in the two sexes. Loss of colour took place in a great majority, other predominating symptoms being a feeling of warmth, dizziness, and sweating. Few symptoms were noted beyond those listed in Question 20 of the record card, there being a few each of sighing, diarrhoea, noises in the head or ears, and pains, tightness, or numbness in the chest, stomach, or limbs. Most cases had a number of symptoms, and it is not easy to classify them into definite type-groups. Broadly, it seems that about a quarter of the cases may be described as having slight symptoms—such as a feeling of warmth or sweating, dizziness, or a blurring of vision; another quarter had several slighter symptoms; while about 12% experienced epigastric discomfort, with and without other minor symptoms, 18% felt nauseated, and nearly 8% vomited. Thirteen per cent., or 1 in 8, lost consciousness.

13. *Length of Rest after Bleeding and Total Time at Centre.*—On the average, non-fainters rested some 25 minutes after bleeding (at one centre the figure was only 16 minutes), while fainters were kept another 20 minutes. The average total time the latter were at the centre was therefore approximately an hour and ten minutes, compared with three-quarters of an hour for the non-fainters. There was, of course, much variability round these averages from person to person.

14. *Observations Regarded as Relevant by those in Charge of Bleeding.*—The most frequent observations about fainting donors made by persons in charge of bleeding, apart from features already discussed, were that it was a hot day or that the room was stuffy, that the donor had been on night work or had had little sleep, was not well, was run down or worried by domestic affairs, had hurried to the centre, or had recently been working hard. Such observations were not, however, made in the case of non-fainting donors, so that there was no means of discovering whether such factors were indeed likely to be of importance.

## II. THE INCIDENCE OF DELAYED FAINTS

For reasons already stated a special inquiry was made into the true incidence of "delayed faints." With the co-operation of donors bled at the four London Blood Supply Depots such an inquiry was carried out in the spring of 1943. To avoid creating a feeling of alarm in donors it was considered inadvisable to draw attention to the possibility of the occurrence of a faint. Every donor bled over a specified period was therefore given a postcard on which was printed:

After the last bleeding  
on.....  
I felt specially fit  
I felt no difference  
I felt some discomfort, as follows:

The donor was asked to cross out what did not apply, and if any discomfort had been felt to describe it simply, giving the date and time when it appeared, and what the donor was doing at the moment. This card, signed by the donor, was returned in a business reply envelope the day after bleeding. The date of bleeding was filled in at the depot.

Eliminating a few cards which lacked sufficient information, there remained a total of 4,212 returns. In the case of three depots records were kept of the number of cards issued and the number returned: 3,442 were issued and only 272 were not returned. Comparison of the figures obtained reveals very little difference between the four depots. Just over three-quarters of the donors reported that they felt no difference: nearly another 10% thought themselves especially fit, giving a total of 86% unaffected or favourably affected by the procedure. The remaining 14%, or roughly 1 in 7, complained of some discomfort, though many complaints were of a trivial nature or of conditions not necessarily related to the bleeding. An example of the former is a slight feeling of lassitude for some hours after bleeding, and, of the latter, of a headache next day. The figures for the four depots agree in showing a slightly higher discomfort incidence in females than in males, the total figures being 11% of the men and nearly 16% of the women.

The complaints recorded are shown in Table XI, and it will be seen that in both sexes the feeling of tiredness is the most common one. It was reported by just over 5% of both men and women. These reports varied widely, from a "slight feeling of lassitude" to "felt very tired and washed out." Approximately 2% of both sexes referred to some pain or stiffness in the arm. Two per cent. of the men and nearly 5% of the women reported feelings of faintness or dizziness, but in many cases these were referred to as very slight or slight and transient.

The evidence, based as it is on individual reports, makes it difficult to determine with certainty the actual incidence of delayed fainting. The cases (4 men and 24 women) which are entered in Table XI under the heading "Fainted" include only those who reported loss of consciousness, or used such terms as "fainted," "collapsed," "black-out," etc. While these were undoubtedly the more severe cases they probably include a few donors who did not actually lose consciousness. Within this definition the incidence of delayed faints was 0.3% for men and 0.8% for women, each of the four centres showing very similar experiences. If inclusion be made of such reports as "almost fainted," "came over very faint," "had to lie down," etc., the incidence becomes 1.2% for men and 1.8% for women.

TABLE XI.—Type of Discomfort

Type Reported*	No. of Reports as % of No. of Persons Bled	
	Men (1,303)	Women (2,909)
Feelings of tiredness, lassitude, sleepiness, or the like .. ..	5.4	5.7
Stiffness or pain in the arm .. ..	2.1	1.9
Headache .. ..	0.5	1.4
Nausea, sickness, and biliousness .. ..	0.1	0.5
Giddiness, dizziness, or the like .. ..	0.5	1.8
Faintness or "felt faint" .. ..	1.1	2.2
"Fainted" .. ..	0.3	0.8
Other various complaints .. ..	0.9	1.3
Total .. ..	10.9	15.6

\* In some instances more than one type of discomfort was mentioned. Such cases have been allocated to what seemed to be the principal grounds of complaint.

## Discussion

It is not easy to compare the incidence of fainting found in a particular survey with that in another, as the definitions of a faint vary. For purposes of the present analysis a donor was regarded as having "fainted" if any of the signs and symptoms usually associated with fainting were severe enough to necessitate delay or alteration in the normal procedure. A similar definition was adopted by Greenbury (1942), and that of Williams (1942) approximates to it closely. Poles and Boycott (1942) applied the term only to a condition so severe that the donor lost consciousness or could obviously neither stand nor sit without doing so. It is therefore not surprising that the incidence of fainting was considerably lower in their series than in that of other workers. Their incidence was 2.8% in 10,000 donors. Williams records 6.85% in 4,317 donors; Greenbury 4.93% in 5,897 donors. In the present series it was not possible to make a complete study of incidence rates, but at two centres it was respectively 5.4 and 5.7%. It would



appear from these figures that under existing circumstances between 5 and 6% of donors may be expected to show some symptoms during or immediately after blood withdrawal.

Poles and Boycott consider that 1 in every 4 donors who faint loses consciousness; this high figure is obviously dependent in part upon their definition. In the present series only 13% lost consciousness. Figures are not given by Greenbury and Williams. The time in the bleeding procedure at which a faint occurs is variable, though the majority take place at the end of bleeding or shortly afterwards. In the present series 2% occurred at venepuncture, compared with 10% reported by Poles and Boycott. During bleeding 23% of faints are recorded here. Poles and Boycott record the occurrence of 6% before 400 c.cm. was withdrawn and of 5% in the latter part of bleeding. In the present series 34% occurred just before withdrawal of the needle and 16% shortly afterwards, while 25% happened during the rest period compared with 19% in this period mentioned by Poles and Boycott. The latter workers record 14% of delayed faints occurring after return to work, applying the term "faint" to anyone who either loses consciousness or can obviously neither stand nor sit without doing so. Within this definition only 1.8% of women and 1.2% of men in the present series fainted after they had left the depot. No explanation of this difference is available.

With the exception of Poles and Boycott, who describe a slight preponderance of male fainters, all observers agree that faints occur more commonly in women. This difference between the two sexes, while not in the present series statistically significant appears in all groups, and is probably real.

No effect of age on the incidence of fainting could be detected, though all previous observers have noted an increased tendency to fainting in younger donors. Williams suggests that this effect of age is more noticeable in men than in women. Greenbury (1942) has previously recorded a preponderance of clerical workers of both sexes in the fainting group. In our own series this preponderance of clerical workers was noted only in single women—the occupations of men and married women appeared unrelated to the fainting rate.

Medical officers in charge of centres are all of the opinion that donors who have been for several hours without food are more liable to faint than those who have recently had a meal. It has proved difficult to collect satisfactory evidence on this point, as in any series there are only a few individuals who have been many hours without eating. Williams points out a low fainting rate in donors who have had their meal within an hour of bleeding, and a definitely increased rate if the period is longer than five hours. In females bled within one hour of eating, the fainting rate was 3.72%, while in those who had not eaten for over five hours the rate was 10%. Poles and Boycott conclude that if the interval is 4½ hours or longer the number of faints is increased from 2.3 to 7.4%. The present investigation suggests that a lack of food could have played a part in only a very small proportion of cases, if at all.

Williams suggested that a high incidence of fainting was associated with menstruation—9.7% compared with 5.96%. We found no such association. Our figures suggested that fainting may be rather less frequent in the fortnight when menstruation is approaching than in the week after its cessation.

The one outstanding fact recorded in the present investigation that has not been previously noted is that 45% of donors who fainted gave a history of having done so on some previous occasion, either when giving blood or at the dentist, etc. This suggests that when the need for blood ceases to be so urgent prospective donors with a history of previous fainting for any reason should be discouraged.

#### Summary

An analysis in given of data collected from 697 blood donors, of whom 362 fainted during the bleeding procedure and 335 did not, he latter serving as a standard of comparison with the former.

The figures suggest that the incidence of fainting is rather lower in men than in single women, and rather lower in single than in married women.

There is no evidence that age, length of wait at the centre before bleeding, or difficulties in bleeding had any effect upon the incidence of fainting.

Menstruation was present at the time of bleeding in an equal number of fainters and non-fainters. Fainting was less common in the fortnight preceding menstruation than in the week after its cessation.

In general there is little difference between the fainters and non-fainters when divided into broad types of work (clerical, factory, and other jobs), but there is a suggestion that women clerical workers have a somewhat higher incidence.

A lack of food could have played a part in only a small proportion of the total number of faints.

A high proportion of fainters gave a history of fainting either at a previous donation or on some other occasion.

An analysis of symptoms revealed that 13% of donors lost consciousness, nearly 8% vomited, and 79% showed only mild symptoms.

Returns from 4,212 donors describing their feelings after bleeding showed that women complained rather more often than men. Of this total 10% reported that they felt especially fit, 76% that they felt no difference, and 14% that they experienced some discomfort, which was often slight. Only 1.2% of men and 1.8% of women recorded delayed faints, using this term in its widest sense. Under 1% of both sexes lost consciousness.

The data obtained are compared with those of previous workers.

It may be concluded (a) that, apart from excluding donors who give a history of fainting either associated or unassociated with blood donation, no factor that is open to correction has been found in connexion with fainting; (b) that, on analysis, the incidence of delayed faints proves to be extremely small.

#### REFERENCES.

- Brown, H. and McCormack, P. (1942) *British Medical Journal*, 1, 1.  
Greenbury, C. L. (1942). *Ibid.* 1, 253.  
Poles, F. C. and Boycott, M. (1942). *Lancet*, 2, 531.  
Williams, G. E. O. (1942) *British Medical Journal*, 1, 783.

## PULMONARY TUBERCULOSIS OF BOVINE ORIGIN

WITH NOTES ON BOVINE INFECTION IN THREE FAMILIES

BY

LESLIE J. CUTBILL, B.Sc., A.I.C.,

AND

ALAN LYNN, M.D.

(From Cheshire Joint Sanatorium, Market Droyton, Salop)

The results of investigations into the incidence of pulmonary tuberculosis due to the bovine type of tubercle bacillus in England and Scotland have been summarized by Griffith (1938). They show that pulmonary tuberculosis of bovine origin is more common in Scotland than in England.

Since 1934 the type of organism present in the sputum of 2,101 cases of pulmonary tuberculosis undergoing treatment in the Cheshire Joint Sanatorium has been determined. The results up to 1943 are as follows: human examined, 2,101; human, 2,052; dysgonic human, 1; bovine, 48; % bovine, 2.28. Most of these strains were isolated on a modified Loewenstein-Jensen medium (Edwards, Lynn, and Cutbill, 1936), though in a few instances guinea-pig inoculation was necessary. Strains which were typically eugonic on this medium were regarded as human. Dysgonic strains, and those differing in any way from typical eugonic strains, were subcultured on Loewenstein's medium and on glycerin-potato. Strains showing typical eugonic growth on subculture were accepted as human. Subcultures of all dysgonic strains, and of all strains not typically eugonic on subculture, together with specimens of sputum from the respective patients, if available, were sent to the late Dr. A. Stanley Griffith, at Cambridge, for confirmation of cultural characteristics and for virulence tests in rabbits. Latterly, rabbits were available here, so that not only the determination of cultural characteristics of strains but their virulence for rabbits have been investigated in parallel here and at Cambridge. The virulence for rabbits of the last 16 dysgonic bovine strains isolated since the illness and death of Dr. Griffith have been investigated at the Cheshire Joint Sanatorium by one of us (L. J. C.).

The presence of avirulent acid-fast bacilli in sputum has been reported by Griffith (1933). The expense involved precluded the use of virulence tests on all the eugonic strains isolated by us. However, guinea-pigs were inoculated with 100 eugonic strains, picked at random. All produced typical tuberculous lesions in these animals. In most of the 2,052 human-type cases, strains with the same cultural characteristics were subsequently isolated on one or more occasions. One of these strains was dysgonic human. In two bovine cases, treated by artificial pneumothorax, in which pleural effusions developed, typical bovine tubercle bacilli were isolated from the effusions as well as from the sputum.

The incidence of 2.28% of pulmonary tuberculosis due to bovine-type bacilli reported here is so far the highest recorded in England, though it is considerably less than the lowest Scottish figures. In Scotland the highest incidence (9%) bovine was found in a predominantly rural area. The area which the Cheshire Joint Sanatorium serves includes the administrative county of Cheshire, the cities of Stoke-on-Trent and Chester, and the county boroughs of Birkenhead, Wallasey, and Stockport. All cases of pulmonary tuberculosis in these areas do not come to this sanatorium, and no children under 15 years of age are admitted. The distribution of population and incidence of phthisis due to the bovine type of tubercle bacillus are given in Table I.

TABLE I

	Population	% of Total Population	No. of Bovine Infections	No. per 100,000 of Population
City and urban ..	1,247,000	89%	23	2
Rural ..	157,000	11%	25	16

Making due allowance for statistical error it is strikingly clear that in the part of England covered by this investigation, as in Scotland, it is the rural population which provides the greater proportion of bovine infections.

### Epidemiology

Griffith (1904-13, 1937), Cobbett (1917), Blacklock (1932), Lange (1932, 1937), Cumming and Foster (1933), Griffith and Smith (1935), Griffith and Munro (1935), and Munro (1939) have discussed in detail the various avenues by which the bovine tubercle bacillus can infect man. The standards set by the recognized authorities quoted above must be the measure of all epidemiological studies concerned with the spread of tuberculosis of bovine origin. The three principal avenues of infection by the bovine bacillus are:

1. *Alimentary*—ingestion of infected material, most commonly milk, either raw or insufficiently heat-treated.
2. *Air-borne droplet infection*—contact with cattle.
3. *Air-borne droplet infection*—human to human.

The factors which constitute the presumptive evidence of these three avenues are:

- (a) History of raw-milk drinking.
- (b) Evidence of alimentary tuberculous infection.
- (c) Cervical or other glandular involvement, bone or joint tuberculosis.
- (d) History of tuberculosis in early childhood.
- (e) Contact with cattle.
- (f) History of tuberculosis in the same family.

One or more of the factors enumerated above, with or without bacteriological confirmation, may be present, but it is often difficult to obtain clear decisive evidence of any one source of infection: proof is most likely to come from the accumulation of presumptive evidence.

### Milk

Some of the primary infections in our cases must have occurred several years before this investigation began in 1934. The time which has elapsed makes it impossible to get reliable information regarding the condition, quality, or quantity of milk supplied in the area covered. The possibility of infection by bovine bacilli in milk definitely existed. The annual reports of the medical officers of health in the years 1934 to 1939 show that milk examined for *M. tuberculosis* did contain virulent

bacilli in from 2% to 17% of the samples taken, the figures fluctuating widely from year to year.

Habitual milk-drinkers we define as drinkers of raw milk regularly as an article of food. We have no really satisfactory history of the milk-drinking habits of the human cases in our series, but we have more complete details of our bovine cases. The most we can say is that we have no evidence of any excessive milk-drinking in this area similar to that found by Griffith and Smith (1935) in North-East Scotland.

Cooked milk, such as in puddings, has been excluded as a source of infection because the time and temperatures required to bake and cook are far above those lethal for *M. tuberculosis*. We presume that most of the individuals in our series took milk in tea or other beverages; but would point out that milk so taken is exposed to conditions similar to "high-temperature short-time" sterilization. We have no evidence as to what would happen to infected milk if exposed to such conditions. This point is being investigated. One case (H.J.) in our familial-infection group was definite about not drinking milk, and only took condensed milk in his tea.

TABLE II.—48 Bovine Cases: Probable Mode of Infection

Alimentary	Air-borne Cattle Contact	Air-borne Familial	No Evidence Obtained	Total
16 (33%)	10 (21%)	3 (6%)	19 (40%)	48

The sixteen alimentary cases include 7 habitual milk-drinkers. 5 with cervical gland infection only, 2 habitual milk-drinkers with cervical gland involvement, 1 habitual milk-drinker with tuberculosis of the spine, and 1 case of tuberculosis of the hip. The 3 air-borne familial cases include one who had contact with cattle and took a "little milk."

Histories of milk-drinking and indications of an alimentary source of infection we have regarded as strong presumptive evidence of milk as the most probable cause. (See Table II: 16 cases (33% of total bovines).)

Included in the milk, gland, and bone infections are cattle contacts (see Table III); these have been withdrawn from the cattle-contact group because of histories of milk-drinking or glandular or bone tuberculosis. On the evidence available the source of their infection was most probably milk. No case has been included under more than one head. In the 19 cases in which no evidence was forthcoming of any source of infection cattle contact can be ruled out; also there was no evidence of familial infection. Milk-borne infection cannot be excluded; these patients were definite that they were not habitual milk-drinkers.

### Cattle Contact

The incidence of bovine cases in cattle-contact and non-cattle-contact groups is as follows: 97 cattle contacts, 16.4% bovine; 2,004 non-cattle contacts, 1.6% bovine. The occupation of our cattle contacts and the type of organism isolated are given in Table III.

TABLE III

Occupation	Human	Bovines		Total
		Cattle Contact only	Milk-drinkers with Glands	
Farmer ..	7	6	4	17
Farm labourer ..	44	3	1	48
Tanner ..	2	1	0	3
Butcher ..	17	0	1	18
Dairy worker ..	9	0	0	9
Lairage labourer ..	1	0	0	1
Women's Land Army	1	0	0	1
Total ..	81	10	6	97

Farm labourers included several general labourers who had at some time worked on a farm for a period of not less than one month. In these cases there was probably very little and no prolonged contact with cattle.

The removal of all cases with alternative sources of infection from the 16 bovine cattle contacts leaves us with 10—6 farmers, 3 farm labourers, and 1 tanner, who were definite about no

drinking raw milk and who showed no clinical evidence suggestive of milk-borne infection or familial tuberculosis.

It is an established fact that cattle can and do acquire primary pulmonary lesions and that it is easy to infect animals by inhalation but difficult to infect by feeding them with tuberculous material (Royal Commission Reports, Cobbett 1917). Cattle can be infected by droplet; Munro (1935) recorded an instance in which an attempt to produce a herd of cattle was frustrated by the herdsman, who was found to be suffering from open phthisis and coughing up bovine bacilli, thus continually infecting fresh cattle. Blacklock (1932) showed that primary lesions do occur in the thorax. He felt justified in assuming that subjects with the primary lesion in the thorax were not infected by way of the alimentary tract but direct through the air passage. We cannot say with absolute certainty that in our 10 cases the lung lesion was primary, but the absence of any evidence of alimentary infection or tuberculosis in early childhood, and the history pointing to infection in adult life, suggest strongly that an occupation which involves contact with cattle also involves the risk of contracting bovine tuberculosis. This is particularly noticeable among farmers whose contact with cattle is likely to be more prolonged and more constant than that of other cattle contacts (Cumming 1933). This risk is probably not entirely removed by the slaughter of the cattle, as a tanner was found to have bovine tubercle bacilli in his sputum.

#### Human to Human

The possibility of human-to-human infection with bovine bacilli was investigated. Griffith and Munro (1935), Griffith and Smith (1935), and Cumming and Foster (1935) admit the possibility of human-to-human transmission. Evidence of more than one person in a family suffering from tuberculosis is common; bacteriological evidence is often difficult to obtain. Griffith and Munro (1935) were of the opinion that in one family investigated there was probably a common source of infection in milk; whereas in the other family the facts were more complex. In the latter both husband and wife had a family history of tuberculosis and a personal history suggesting infection before marriage. The presence in both individuals of bovine strains of attenuated virulence strongly suggested marital infection.

In the present series the family histories of the 48 bovine cases were as follows: positive, 9; negative, 39. The results of examining the 9 positive family contacts were: dead, 2; sputum specimens unobtainable, 4; bovine bacilli isolated, 3; human bacilli isolated, 0. Of these 9 bovine cases with a positive family history of tuberculosis 3 had relatives whose sputum contained bovine-type tubercle bacilli. Two of these relatives were admitted to this sanatorium suffering from pulmonary tuberculosis, and are included in the 48 cases of bovine phthisis. The third is not included, as the sputum specimen from this case was specially obtained because of the family history. There are therefore three families in each of which two individuals are suffering from pulmonary tuberculosis due to the bovine type of bacillus, as follows: family A, father and son; family B, father and daughter; family C, husband and wife.

TABLE IV.—Details of Three Families with Bovine Phthisis

Family	Members with Bovine P.Tb.	Age	Occupation	Milk-drinker	Type of Pulm. Lesion
A	Father (D. H.)	41	Farm lab.	No	Chr. fib. caseous
	Son (G. H.)	24	" "	Little	Subacute "
B	Father (S. J.)	44	" "	Yes	Chr. fib. Subacute "
	Daughter (A. J.)	18	Domestic	No	" "
C	Wife (M. J.)	39	Housewife	"	Chr. fib. "
	Husband (H. J.)	40	Clothier	"	" "

In each family the first-mentioned member was probably the first to be infected.

A striking feature of these cases is that in each family the member whose infection was probably the earlier was a cattle contact, and in only one instance a milk-drinker. None of these showed any clinical evidence of infection by ingestion. This suggests that the primary source of infection was contact with tuberculous cattle. In this connexion family C is of

further interest. The wife (M. J.), the daughter of a farmer, had three sisters, of whom two had no direct contact with cattle and did not develop tuberculosis. M. J. and the other sister worked with cattle, and both developed pulmonary tuberculosis, of which the sister died before this investigation began. The type

TABLE V.—Bacteriological Findings: Virulence Tests in Rabbits

Family and Member	Experiments by A.S.G.				Experiments at C.J.S.			
	Dose (mg.)	Method	Dn. of Life (Days)	Result	Dose (mg.)	Method	Dn. of Life (Days)	Result
A { J. H. 2.1 (a) 5.0 (b) G. H. 5.0 (a) 0.001 (b)	(a)	S	64	Type G.T.	Animals not available			
	(b)	S	68					
	(a)	S	92	Mod. G.T.				
	(b)	I	49	Sev. G.T.				
B { S. J. 5.0 (b) A. J. 0.001 (b)	(b)	S	82	Type G.T.	0.005 I-O	S	25	G.M.T. Type G.T.
	(b)	I	35	G.M.T.			41	" "
C { M. J. 0.01 (a) H. J. 0.01 (a) 5.0 (b)	(a)	I	46	Sev. G.T.	1.0 I-O	S	21	G.M.T.
	(a)	I	31	G.M.T.			38	G.M.T.
	(b)	S	90	Mod. G.T.				

S = Subcutaneous.

I = Intravenous.

G.T. = Generalized tuberculosis.

G.M.T. = Generalized military tuberculosis.

(a) = Subcutaneous.

(b) = Intravenous.

A.S.G. = by A.S.G.

C.J.S. =

of organism therefore being unknown. The husband (H. J.) was fit and well, had no tuberculous family history before marriage or contact with cattle at any time, nor did he drink milk. From both husband and wife fully virulent bovine strains were isolated. H. J.'s infection was probably due to contact with his wife.

Similarly, in family B the only known source of infection was the father. The second infection in this family was probably due to human-to-human transmission. In family A the second member infected was in contact with his tuberculous father, but he was also in contact with cattle, and drank a little raw milk. The father was the probable source of infection, but contact with tuberculous cattle and milk-borne infection cannot be excluded.

#### Summary

The number of cases of pulmonary tuberculosis due to bovine-type bacilli among 2,101 cases in a sanatorium was 48 (2.28%), the highest so far recorded in England.

Infection from milk most probably occurred in 16 cases (33%).

In 19 cases (40%) no direct evidence of any source of infection was found, though milk-borne infection could not be excluded.

Evidence of infection by direct contact with cattle is strongly suggested in 10 cases (21%).

Details are given of three families, in each of which two members were found to have pulmonary tuberculosis of bovine origin. The original source of infection in each family was probably contact with tuberculous cattle, and the subsequent infection of the other member was probably due to human transmission of bacilli of bovine type.

In addition to the danger from infected raw or inefficiently pasteurized milk, the occurrence of human-to-human, cattle-to-human, and human-to-cattle infection becomes increasingly difficult to ignore.

Bovine-type bacilli were recovered from pleural effusions following artificial pneumothorax in two cases of bovine phthisis.

We record our grateful thanks to the late Dr. A. Stanley Griffith of Cambridge for his generous help and advice, and to Dr. Peter W. Edwards, medical superintendent of the Cheshire Joint Sanatorium, for invaluable help and criticism throughout this investigation and for permission to publish these results.

#### REFERENCES

- Blacklock, I. W. S. (1932). *Proc. roy. Soc. Med.*, 25, 725.
- Cobbett, L. (1917). *Causes of Tuberculosis*, Cambridge.
- Cumming, W. M. (1933). *Tubercle*, 14, 235.
- and Foster, W. M. (1935). *J. Path. Bact.*, 35, 153.
- Edwards, P., Lynn, A., and Cutbill, L. J. (1936). *Tubercle*, 17, 321.
- Griffith, A. S. (1904-13). Royal Commission Reports, London.
- (1933). *Tubercle*, 15, 53.
- (1937). *Tubercle*, 18, 529.
- (1938). *Proc. roy. Soc. Med.*, 31, 1208.
- and Munro, W. T. (1935). *British Medical Journal*, 2, 147.

## PATCH-TESTING IN AN EAST COAST TOWN

BY

ELENORA J. SIMPSON, M.B., Ch.B.

(Children's Department, James Mackenzie Institute for Clinical Research, St. Andrews)

For the last 20 years the majority of St. Andrews children have had a routine medical examination from birth. From 1920 to 1940 88% of all children born to permanent residents in the town were seen at the child welfare centre, while 55% of these attended the James Mackenzie Institute after they reached 2 years of age. In addition, some of those born outside the burgh and temporary residents in St. Andrews attend the clinics. The children are examined at the Institute three times a year until they reach school age, and thereafter once a year until they begin work. Information obtained from the family doctor, the school medical officer, and specialist services (ophthalmic, orthopaedic, tuberculosis) is added to the records. It is noteworthy that all classes of the community attend. Thus a proportion of the child life in St. Andrews, a seaside and holiday resort, is available for research.

## Method

It was thought that it would be of value to discover what number of these children reacted to the Vollmer patch test (V.P.T.) for tuberculosis, and to try to relate the findings to clinical history and examination. Therefore, in 1941 the V.P.T. was added to the routine examination of all the children of whom we had a recorded history since birth.

The test consists in the application to the skin over the sternum, or on the back between the scapulae, of a strip of adhesive tape on which are three squares of gauze, the two outer squares having been saturated with old tuberculin and dried, while the central one is a control of dried glycerin broth. The skin must be thoroughly cleaned with acetone and allowed to dry before the patch is applied. The patch is left on for 48 hours, during which time it must not be allowed to get wet. Results are read 24 or 48 hours after removal of the patch. A positive finding is one in which the skin beneath the two outer squares shows a definite square of erythema. In strongly positive cases some vesiculation and a spreading of erythema occur, accompanied by itching.

In this investigation the result was read 24 hours after the removal of the patch, the child being visited at home for this purpose. Positive results were noted as one, two, or three pluses, according to the degree of the reaction—a pink square being +, a deeper red with slight raising of the skin ++, and a definite vesiculation and an erythema spreading from the site of the original square +++. The proportion of the degrees of reaction was 46% +, 26% ++, and 28% +++. Some attempt was made to assess the importance of the degree of reaction.

With regard to the reliability of this test for tuberculosis, Vollmer (1940) reports that ten different investigators made comparative studies of 4,285 cases and found 1,114 positive reactions to the patch test, as compared with 1,119 positive reactions to the Mantoux test; but other workers have not confirmed this degree of accuracy. The majority of reports indicate that the patch test is accurate in 95 to 98% of young patients (B.M.J., 1942, 2, 101).

## Results

Five hundred patches were obtained direct from New York through the courtesy of Messrs. Lederle, and results from 487 children aged from 2 to 16 years were obtained. Four children were examined twice, and nine patches were spoilt through being removed too soon. Refusal to allow the test was met with in only three instances.

There were 340 (69%) negative and 151 (31%) positive results in the 491 examinations. Of the four re-examined children who were originally negative three had become positive and one remained negative. Table I shows the numbers and results at different ages. In all positive cases an attempt was made to find the source of infection, and the work was linked up with that of the family doctor and the tuberculosis officer. St. Andrews is well supplied with T.T. milk, but a large proportion of the population use non-T.T. or unpasteurized milk.

TABLE I.—Showing Age at Examination of St. Andrews Children and Results of the V.P.T.

Year of Age:	2	3	4	5	6	7	8	9	10	11	12	13	14	14+	Total
V.P.T. neg.	16	68	38	32	35	22	23	25	17	15	17	13	5	14	340
" pos.	1	12	12	16	7	9	12	13	17	10	11	6	9	16	151
Total ..	17	80	50	48	42	31	35	38	34	25	28	19	14	30	491

Out of 500 possible tests, 9 were spoilt and 491 completed on 487 cases.

If these children are grouped in ages it will be seen that the percentage of positive results rises with age:

(a) Up to and including 5 years (195 children)	.....	21% positive
(b) 6-10 years	(180 " )	32% "
(c) Over 10 years	(116 " )	45% "

These percentages of positive reactors are slightly higher than those recorded by Crowe (1942) in percutaneous and Mantoux tests carried out mostly on dispensary patients who were considered free from active tuberculosis. Gilchrist *et al.* (1942) found 36% of positive reactions to a patch test in 385 adolescent boys who volunteered for the Air Training Corps. Shaw (Price, 1942), Belfast Tuberculosis Dispensary, using P.P.D. in two strengths, examined 1,634 contacts and non-contacts, aged from 1 to 14 years, and had 34% positive reactors.

The histories of the four children who were re-examined with the V.P.T. are as follows:

Case 1.—This boy, aged 4, negative Jan., 1942, was subsequently in close contact with a grandfather who died of pulmonary tuberculosis; in June, 1942, the child developed pleurisy, and was positive (+++) to the V.P.T. He has done well with sanatorium treatment.

Case 2.—This child, aged 5, was negative in Oct., 1942. He was x-rayed because his younger sister and older half-brother were positive reactors, and he had moist rales and a few rhonchi. The x-ray report was: "Definite enlargement of hilar glands with shadows spreading from root into right upper lobe, very suggestive of early infiltration of the lung." The child then developed measles and bronchopneumonia. In March, 1943, the V.P.T. was positive (++) and the x-ray report was: "The enlargement of the glands at the lung root is less marked, but there is now a definite lesion of the right upper lobe. The lower interlobar septum is well defined, and the appearances suggest there has been a small interlobar effusion." He had gained 4½ lb. in weight, had "never lost his appetite" in the five months, and looked well.

Case 3.—Aged 6, this boy was negative in June, 1941. His nutrition was only fair, and he had had a febrile attack three months previously. In March, 1942, the health visitor found him with a temperature and referred him to his family doctor. He was off school for a month, and was not seen again at the Mackenzie Institute until June, 1942, when clinically he had tuberculosis of the left lung and the x-ray report was: "Some enlargement of root glands with commencing calcification. There is a small area of infiltration in the left upper lobe." The V.P.T. was positive (+++). He has done very well with sanatorium treatment.

Case 4.—This patient had a history of infantile eczema and asthma. He was negative in July, 1941, and a few months later developed cervical adenitis, which required operation. The surgeon considered the glands tuberculous, but the V.P.T. was negative in April, 1943.

## Radiography

An x-ray examination of the chest was made in 131 of the 151 positive reactors; the remaining 20 were working and unable to attend, had left the town, or their parents refused to allow x-ray examination. Dr. B. W. Anderson, deputy county medical officer for Fife and acting tuberculosis officer for East Fife, has kindly examined the films and classified them in Table II.

TABLE II.—Results of X-ray Examinations in 131 Children with Positive Reactions to the V.P.T.

Cases	Tuberculous Lesion of Lungs or Pleura	Require Further Observation	Calcified Primary Focus	Enlarged Hilar Glands	Calcified Nodes	Normal Limits
131	5 (3.8%)	14 (10.7%)	1 (0.8%)	8 (6.1%)	41 (31.3%)	62 (47.3%)

Sixteen negative reactors were also x-rayed, and the films were classified. One showed calcified nodes, two had enlarged hilar glands, and the remaining thirteen were within normal limits. It was realized that sixteen was a totally insufficient number for a control group. The ideal would have been to

ray the whole 487 children. Of the five children showing definite tuberculous lesions, one, aged 3 years, came for routine examination; her mother said she had "seemed tired the last few weeks." The V.P.T. was strongly positive, and x-rays revealed military tuberculosis. She died three weeks later. Another, aged 7, had close contact with his tuberculous father, who died in 1941. The remaining three are Cases 1, 2, and 3, mentioned above.

### Housing

The housing of the children is shown in Table III under categories A (good), B (fair), and C (poor). The classification of the houses was made by the public health authorities. In the quinquennium 1921-5 only 41% of St. Andrews children were born in "good" houses; but 628 new houses have been built since that time and a number of old houses reconstructed. It will be noted that, out of the total of 487 children examined, 156 (94%) were well housed at the time of this investigation, and that therefore only 31 (6%) children living in B or C houses were examined with the V.P.T.

TABLE III—Housing

	A	B	C	Total
Negative reactions	111	20	3	134
Positive ..	143	7	1	151
Total	456	27	4	487

Combining B and C, a fourfold table gives:  $\chi^2 = 0.199$ ;  $P = 0.66$ . There is therefore no significant difference between the housing of the two groups.

### Morbidity

The mass of data available in each child's record, which is complete from birth, made it difficult to select points in the case history suggestive of tuberculosis. Also, the range of age of the 487 children—from 2 to 16 years—renders any analysis of little value statistically. However, it may be of interest to record that the case histories were examined under the following readings: (i) contact with notified or suspected pulmonary tuberculosis; (ii) respiratory disorders of a degree of at least two attacks of bronchitis or one of pneumonia; (iii) febrile attacks; (iv) operation on cervical glands; (v) poor nutrition; (vi) allergy; (vii) negative to i-vi. The findings are given in Table IV.

TABLE IV.—Showing Morbidity in 487 Children examined with the V.P.T.

No. of Cases	i Contact	ii Respiratory	iii Febrile-cula	iv Gland Operations	v Poor Nutrition	vi Allergy	vii Record Neg. for i-vi
V.P.T. neg., 336 (15%)	50 (15%)	32 (6.8%)	10 (3%)	5 (1.5%)	22 (6.5%)	11 (3%)	233 (69%)
V.P.T. pos., 151	32 (21%)	13 (12.5%)	12 (8%)	5 (3%)	11 (7%)	13 (9%)	81 (54%)

As would be expected, the morbidity is higher in the positive reactors, but it should be noted that 81 (54%) had none of the above signs or symptoms suggestive of tuberculosis. The consensus of opinion is that one cannot differentiate human and bovine infection by tuberculin tests. The fact that five negative reactors had had cervical gland operations strengthens the impression that the V.P.T. does not react so well to bovine infection. Also, one of the children examined was proved bacteriologically to have a bovine infection of lung and kidney, and she was a negative reactor.

### Summary

The investigation was undertaken as a specific piece of research on the lines of the original aims of the James Mackenzie Institute "to investigate disease before the occurrence of any structural change in any organ of the body, with a view to providing a diagnosis at a period earlier than is possible by the methods now in use, and in order to obtain a knowledge of the circumstances that favour the onset of disease."

Four hundred and eighty-seven children in a seaside and holiday resort were examined with the Vollmer patch test for tuberculosis, and 31% gave a positive reaction. The children were unselected except for the fact that all had health records from birth. Their housing conditions are tabulated. An analysis is given of the x-ray

films of chests in 86% of positive reactors. An attempt has been made to compare morbidity of positive and negative reactors.

Acknowledgment is due to Dr. James Orr, Director of the James Mackenzie Institute, for permission to publish this paper; and thanks are expressed to Dr. B. W. Anderson for his indispensable help with the x-ray films and for valuable encouragement and suggestions.

### REFERENCES

- Crowe, M. P. (1942). *British Medical Journal*, 1, 266.  
 Gilchrist, J. C., Graham, S. H., and Davies, T. W. (1942). *Ibid.*, 1, 291.  
 Price, Dorothy S. (1942). *Tuberculosis in Childhood*, Bristol.  
 Vollmer, H. (1940). *J. Pediatr.*, 16, 627.

## SULPHAGUANIDINE IN THE TREATMENT OF FLEXNER DYSENTERY

BY

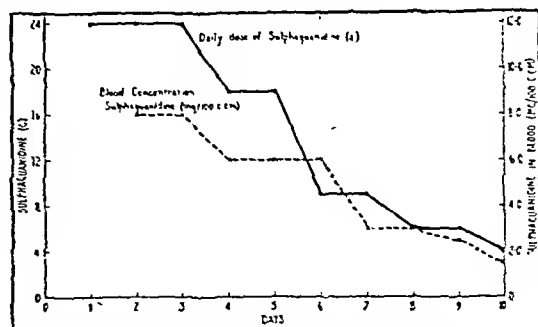
H. G. SMITH, B.Sc., Ph.D., M.B., Ch.B.  
 (Knightswood Fever Hospital, Glasgow)

The treatment of dysentery with sulphaguanidine has not gained the measure of approval accredited to the use of the other sulphonamides in many other infections. At least at this hospital the results were not entirely conclusive, although it is true that the majority of cases were of the Sonne type, against which sulphaguanidine is said to be less effective. It should be appreciated that any antibacterial agent is set a severe task when endeavouring to "sterilize" the bowel. The total length of the gut, its further increase in surface area by the throwing up of mucous membrane into folds, together with the dilution of the drug in faecal contents of the bowel, present a major problem in an attack on all parts of the intestine. It was thought that success might follow the administration of relatively large doses of sulphaguanidine, which, by reason of the poor absorption of the drug, would result in a high concentration of the presumed bacteriostatic agent throughout the bowel.

### The Investigation

The admission of 44 young female adults, ranging in age from 17 to 37 years (average 21), suffering from Flexner dysentery has given an opportunity of testing the effects of large doses. Unfortunately, when the early admissions were made it was not suspected that such a large number of patients would arrive ultimately, otherwise a controlled observation would have been planned. Certain points, however, make the results worth recording. Of the patients only ten had a record of diarrhoea before admission. The remainder were symptomless contact carriers. Five had received sulphaguanidine before admission, but not more than 10.5 g. During the period in hospital the only clinical manifestations reported were transient blood and mucus in the stools in four and mucous stools in two cases.

**Dosage.**—The total amount of sulphaguanidine was 142 g., given orally, over 10 days as follows: 24, 24, 24, 18, 18, 9, 9, 6, 6, and 4 g. A number of patients developed a toxic rash (described below), whereupon the drug was stopped; but in no



Graph showing sulphaguanidine blood levels.

case did any patient receive less than 129 g. in all. The level of sulphaguanidine in the blood was estimated for each day by random selection. Only one specimen of blood was withdrawn from most of the patients, but in some a second estimation



was made. The first three specimens, taken during the second or third day, were surprisingly high, ranging from 10 to over 14 mg. per 100 c.cm. Accordingly the fluid intake was increased from 4 pints to 6 pints a day. The average blood concentration for each day is represented graphically (see Fig.). It will be seen that the blood concentration follows a pattern essentially similar to that of the daily dose of the drug.

**Bacteriological Results.**—The bacteriological results obtained at the end of treatment were very satisfactory. Over a period of 14 days three successive rectal swabs and two specimens of faeces from each patient were examined: The stools were non-dysenteric in character, and both faeces and rectal swabs were found to be negative for *B. dysenteriae* (Flexner). In addition, magnesium sulphate was administered to 6 patients to produce watery stools: these gave negative results for *B. dysenteriae* (Flexner).

**Toxic Effects.**—Previous experience had shown that children tolerate massive doses of sulphaguanidine with no adverse effects. As much as 168 g. of the drug has been given over 16 days, and 330 g. over 28 days, to children aged 2 years. It was surprising, therefore, to find that no fewer than 21 of the 44 adult patients developed a toxic rash between the eighth and tenth days of treatment—mostly on the ninth day. With one exception all the rashes were pink and maculo-papular. Ten were generalized morbilliform rashes (one of which was petechial before fading). In one instance the rash was at first scarlatiniform, but later the same day it became morbilliform in type. The remainder were localized to particular parts of the body, such as the thighs, back, arms, or face. In one case a circinate urticarial rash was recorded. Here, small red macules appeared on the outer aspects of the thighs, spreading out with a pink raised edge to a diameter of about 2 in. and fading in about 24 hours. Three crops occurred before the rash disappeared entirely after 4 days. In other cases the rash faded in from 2 to 3 days. There was little constitutional upset, though a few patients complained of a burning sensation of the face. Two had more severe symptoms, with elevation of temperature to 100° and 101° F. generalized rash, a burning sensation of the skin, swollen face, and pink and suffused eyes.

Longcope (1943) suggests that the following sulphonamide rashes occur in chronological order: (1) urticarial, (2) scarlatiniform, (3) morbilliform, (4) petechial. Hageman and Blake (1937) described ten cases of toxic rash from their series of 134 cases occurring about the seventh and eighth days, and often found a leucocytosis with increase in percentage of eosinophils concomitant with the rash. There was no evidence of a leucocytosis in the present series, though in the majority of cases an increase in the percentage of eosinophils was noted. There was no correlation between concentration of the drug in the blood and the development of a rash. The early blood levels were not higher than the rest of the cases, and at the time the rash appeared the blood levels were usually negligible. No case which developed a rash had received previous treatment with sulphaguanidine.

**Sensitization.**—In view of the occurrence of such a high percentage of toxic rashes it was decided to obtain information regarding hypersensitivity to the drugs of the sulphonamide series. Accordingly 12 of the 21 cases were divided into 4 groups of 3 individuals, who were given the following single test dose: Group 1, 1 g. sulphathiazole; Group 2, 1 g. sulphathiazole; Group 3, 1 g. sulphadiazine; Group 4, 2 g. sulphaguanidine. No reaction was obtained with the first three drugs. With sulphaguanidine only one patient of the three showed a reaction. A scarlatiniform rash on face and chest made its first appearance one hour after administration, and five hours later became generalized and blotchy. There was no constitutional upset, and in 20 hours the rash had faded. The 9 patients who had previously received the other sulphonamides were later given 2 g. of sulphaguanidine. Seven developed a toxic reaction as follows:

1. Scarlatiniform rash developed on face, neck, and elbows 6 hours after administration. Eyes suffused and painful. Slight elevation of temperature. Faded 12 hours after appearance.
2. Scarlatiniform rash on arms and thighs appeared within 7 hours. Rash faded 12 hours later.
3. Generalized scarlatiniform rash appeared in 7 hours, with suffusion of eyes, photophobia, and sickness. Faded 12 hours later.

4. Generalized scarlatiniform rash appeared in 6 hours. Eyes suffused. No discomfort. Disappeared 11 hours later.

5. Generalized scarlatiniform rash appeared in 6 hours, with severe constitutional symptoms—viz., headache, sickness and vomiting, suffusion of eyes; and elevation of temperature.

6. Generalized scarlatiniform rash appeared in 7 hours. Faded 12 hours after appearance.

7. Scarlatiniform rash on legs appeared in 7 hours. Faded 11 hours after appearance.

### Discussion

From the therapeutic point of view the results were very satisfactory. It is unusual to obtain five consecutive negatives from a series of cases of dysenteric infection. On the debit side, however, the occurrence of so many toxic rashes must be regarded seriously, and constitutes a strong argument against massive dosage. It may be suggested that the total dose should not exceed 110 g. in the adult. The results of the investigation of the drug sensitization are considered interesting, and the conclusion drawn is that the primary hypersensitivity encountered was not general for sulphonamides but was confined to sulphaguanidine alone. The evidence seems to suggest that the hypersensitivity was due to the guanidine radical of the sulphonamide compound.

### Summary

Forty-four young female adults, mainly symptomless carriers of *B. dysenteriae* (Flexner), were treated with massive doses of sulphaguanidine.

The bacteriological results were satisfactory after conclusion of treatment. Five consecutive negative results were obtained for each patient.

About the ninth day of treatment 21 patients developed a toxic rash. Apart from one circinate urticaria, the rashes were pink and morbilliform. The presence of a scarlatiniform and a petechial type was noted among the latter. There was no relation to a high blood concentration of the drug.

Eight patients out of 12 reacted to a sensitization dose of sulphaguanidine. In some cases the constitutional upset was severe. There was no response to sensitization doses of other sulphonamides. It is suggested that the guanidine radical may be the sensitizing agent.

The high incidence of toxic rashes suggests care in dosage.

I wish to thank Dr. T. Anderson, superintendent of Knightswood Hospital, for constant advice and encouragement throughout this investigation. Thanks are also due to Dr. W. R. Wiseman, Glasgow Public Health Laboratory, who performed the routine bacteriological examinations.

### REFERENCES

- Hageman, P. O., and Blake, F. G. (1937). *J. Amer. med. Ass.*, 103, 642.  
Longcope, W. T. (1943). *Medicine*, 22, 251.

## HAEMOLYTIC DISEASE OF THE NEWBORN THE PREPONDERANCE OF HOMOZYGOUS Rh-POSITIVE FATHERS

BY

G. L. TAYLOR,\* M.D., Ph.D., M.R.C.P.

AND

R. R. RACE,\* M.R.C.S., L.R.C.P.

(From the Galton Laboratory Serum Unit, Department of Pathology, Cambridge)

A predominance of homozygous RhRh fathers in families where an Rh-negative mother has borne children suffering from haemolytic disease of the newborn has been suggested by Race, Taylor, Cappell, and McFarlane (1943). An Rh-negative mother is more liable to be immunized when every pregnancy is Rh-positive and provides the antigenic stimulus, as it does with a homozygous husband, than when he is heterozygous RhRh and some of the children are positive and others negative. This being so, it is obvious that the proportion of homozygous fathers producing affected children will be greater than the proportion of heterozygous fathers. It can readily be shown that in a random sample of Rh-positive males about 3 out of 7 must be homozygous and 4 must be heterozygous.

Race and Taylor (1943) have described a serum which discloses the genotype of half the persons who are homozygous RhRh. This serum, called "St" from the first two letters of the donor's surname, agglutinates the blood of all Rh-negative rhrh and of all heterozygous Rhrh persons, but it fails to react

\* Working on behalf of the Medical Research Council.

with about 20% of bloods (St-negative) all of which must therefore be homozygous RhRh and represent about half the Rh-positive homozygotes—about 38% of the population. Race and Taylor pointed out that the extent of any preponderance of homozygotes among the fathers of erythroblastic children should be indicated by the proportion found to be St-negative. In 46 families in which the disease occurred and in which all the mothers were Rh-negative and had anti-Rh agglutinin in their sera, 18 of the fathers have been St-negative and 28 St-positive. If about half of the homozygotes are St-negative, then it appears that of 46 fathers about 36 were homozygous; these frequencies, compared with those expected in the general population, are:

	Observed St	Observed St -	Estimated Homozygotes	Estimated Heterozygotes
46 fathers	18	28	36	10
	Expected St	Expected St -	Expected Homozygotes	Expected Heterozygotes
46 random Rh+ men	10-11	35-36	20	26

and in that case the homozygous fathers would be  $\frac{36}{10} \times \frac{26}{70}$ —i.e., 4.68—times more dangerous than the heterozygotes. The difference in distribution among the fathers and the normal population is highly significant statistically. Again, in a normal population of 46 Rh-positive persons 10 or 11 are expected to be St-negative and about 35 St-positive; that 18 fathers were St-negative and 28 St-positive is statistically significant.

Further evidence of the preponderance of homozygous fathers in affected families is given by the results of more recently discovered tests which determine certain Rh genotypes. The inheritance of the Rh groups is determined by a series of multiple allelomorphs, and by the use of different sera from the mothers of erythroblastic babies the genotypes of about 80% of persons can be recognized. (See Race and Taylor, 1943; Race, Taylor, Boorman, and Dodd, 1943; Race, Taylor, Cappell, and McFarlane, 1944.)

Of the 46 fathers 38 were examined by tests which recognize the Rh<sub>1</sub>rh and Rh<sub>2</sub>Rh<sub>2</sub> genotypes. In the general population the frequency of Rh<sub>1</sub>rh is about 33%—that is, about 40% of Rh-positives. Of 38 Rh-positive fathers, therefore, 15 would be expected to be Rh<sub>1</sub>rh and 23 not Rh<sub>1</sub>rh. But only 5 fathers were Rh<sub>1</sub>rh—a highly significant departure from expectation, which shows a marked shortage of this commonest type of heterozygote. Thus:

	Rh <sub>1</sub> rh	Not Rh <sub>1</sub> rh
38 fathers: observed	5	33
38 random Rh+ men: expected	15	23

In 435 unselected donors the ratio of the genotype Rh<sub>1</sub>Rh<sub>1</sub> to Rh<sub>1</sub>rh was almost exactly 1 to 2; but of these 38 fathers 14 were Rh<sub>1</sub>Rh<sub>1</sub> and 5 Rh<sub>1</sub>rh—again a highly significant shortage of Rh<sub>1</sub>rh.

The tests on the last 18 of the 46 fathers made it possible to recognize the following genotypes:

	Rh <sub>1</sub> Rh <sub>1</sub>	Rh <sub>1</sub> Rh <sub>2</sub>	(Homozygotes)	Rh <sub>1</sub> rh	Rh <sub>2</sub> rh or Rh <sub>2</sub> Rh <sub>2</sub>	(Heterozygotes)
Observed	7	6	(13)	3	2	(5)
Expected	4	3	(7)	8	3	(11)

The serological tests do not yet differentiate between the genotypes Rh<sub>1</sub>rh and Rh<sub>2</sub>Rh<sub>2</sub>, but, assuming the two fathers in this group are heterozygotes, then there are 13 homozygotes and 5 heterozygotes, whereas 7 and 11 would be expected in the general population: the discrepancy is on the verge of statistical significance. The 18 fathers have 23 Rh<sub>1</sub> genes to 8 Rh<sub>2</sub> genes—practically the same ratio, 41 to 15, found in the general population. This suggests that both genes are equally effective in producing the disease.

It may be thought that the manner of ascertainment has been responsible for the high proportion of homozygous fathers found in our sample, and that the diagnostic support given by a history of more than one jaundiced baby may make a doctor the more likely to send us blood samples and thus

prejudice our series in favour of homozygous fathers. This difficulty can be overcome if we consider fathers of families in which only one child is erythroblastic. There are 26 such: 9 of them are St-negative—a proportion not very different from that found in the remaining families with 9 St-negative fathers out of 20. Twenty of the fathers of families with a single affected child were examined by the tests which recognize Rh<sub>1</sub>rh and Rh<sub>2</sub>Rh<sub>2</sub>, and they show a significant shortage of Rh<sub>1</sub>rh, there being only 2 instead of the expected 8, while the ratio of Rh<sub>1</sub>rh to Rh<sub>2</sub>Rh<sub>2</sub> is 2 to 7 instead of the expected 6 to 3.

### Conclusions and Summary

The findings reported prove that there is a marked preponderance of homozygous fathers in families affected by haemolytic disease of the newborn: the homozygote appears to be about four or five times more dangerous than the heterozygote. This predominance of homozygotes affects enormously the chances of Rh-negative, and therefore unaffected, children being born. The genotype of about three-quarters of Rh-positive people can be determined serologically, and unless it can be shown that the father is heterozygous in this way, or by his having an Rh-negative child or an Rh-negative parent, the prognosis is entirely unfavourable.

### REFERENCES

- Race, R. R., and Taylor, G. L. (1943). *Nature*, 152, 300.  
 ———, Boorman, K. E., and Dodd, B. E. (1943). *Ibid.*, 152, 563.  
 ———, Cappell, D. F., and McFarlane, M. N. (1943). *British Medical Journal*, 2, 289.  
 ——— (1944). *Nature*, 153, 52.

## Medical Memoranda

### Latent Malaria presenting as Anaemia

Anaemia is a well-known feature of malaria, both during the acute phase of the disease and in convalescence. Treatment by iron is not by any means always necessary, but in most cases is quickly curative. An anaemia, nevertheless, may occur which is both iron-resistant and susceptible to antimalarial therapy, at a time when the parasite would not normally have been suspected as the causative factor. Two such cases of anaemia are here reported. Response to antimalarial treatment was immediate and satisfactory in both cases.

#### CASE I

During Oct., 1942, this man had a first attack of clinical malaria which was apparently successfully cured by the usual course of treatment. Ever since then he had complained of cough, pains in the joints, and profuse sweats, and he was apyrexial. He was seen as an out-patient on Dec. 30—two months after his initial illness—when his condition suggested a blood count. This showed: R.B.C., 3,170,000; Hb, 70% (Sahli); C.I., 1.1; W.B.C., 5,100—polymorphs 38%, lymphocytes 56%, monocytes 6%.

He was admitted to hospital five days later. Detailed physical examination revealed a young man in poor condition and with marked pallor. Temperature 99°; pulse 80. Tongue furred; throat clear. Heart normal in size and position; rhythm regular. On auscultation there was a widespread systolic murmur, best heard along the left border of the sternum. B.P. 120/60. The lungs showed no abnormality. The liver was palpable and tender. The spleen was not palpable. Blood films for malaria parasites were persistently negative.

X-ray films of the chest showed no abnormality. On Jan. 1, 1943, a blood count gave: R.B.C., 3,640,000; Hb, 90% (Sahli); C.I., 1.2; W.B.C., 6,000 (polymorphs 53%, lymphocytes 42%, monocytes 3%, eosinophils 2%). Intensive iron therapy was instituted (ferri et ammon. cit. gr. 120 per diem). After one week the red cells had diminished by 20,000 and the Hb by 10%. Symptoms were not diminished, and his condition was unchanged. Some days later he suddenly developed an acute pyrexial illness, during which M.T. parasites were found in the blood film. Iron was discontinued and antimalarial treatment given. At the end of the treatment the red cell count had risen to 4,390,000, and when the patient was discharged it and symptom-free a few days later this number had reached 5,500,000, with 96% Hb and 12,200 white cells, although anti-anæmic treatment by iron had not been reinstituted.

#### CASE II

A prisoner of war, 42 years old, admitted to hospital on May 11, 1943, complained of weakness, headache, and slight diarrhoea. There was a history of ten attacks of malaria in the previous five years.

On examination the patient was found to be pale but not icteric. Temperature normal; tongue coated. Some petechial spots were

present on gums and palate. The chest was normal. The spleen was palpable and tender. Pathological examination of the stools showed no evidence of dysentery. In four days the stools were repeatedly normal and the blood count was: R.B.C., 2,900,000; Hb, 57%; C.I., 1.0; W.B.C., 13,000. Intensive iron therapy and liver diet for 16 days produced no beneficial effects—in fact, there was a diminution of 490,000 in the red cell count and 8% in the Hb estimation. His temperature remained normal, his spleen was palpable, and no malarial parasites were found in the blood films. Since neither symptoms nor anaemia had been improved by iron therapy and liver diet this was stopped, and replaced by a full course of antimalarial treatment. The response was immediate. By the end of the course he was symptom-free; the spleen was not palpable; and the blood count was: R.B.C., 4,350,000; Hb, 82%; C.I., 0.9; W.B.C., 5,800 (P. 69%, L. 22%, M. 6%, E. 3%).

British Military Hospital, Khartoum.

G. BAUM, Lieut., R.A.M.C.

## Two Cases of Imperforate Anus

In view of the comparative rarity of the condition, perhaps the two cases here reported may be of interest in that they illustrate two of the different varieties of the condition.

### CASE I

The baby had been born precipitately 48 hours before I was called to see it by a district midwife, who informed me that it had vomited repeatedly and had passed no meconium since birth. On examination it was an apparently normal full-term child, weighing 5 lb. 7 oz., but obviously an ill one. Its temperature and pulse were normal, but the abdomen was somewhat distended and the child vomited every feed that was given. It was admitted to hospital the same day, and x-ray photographs confirmed the clinical diagnosis of imperforate anus. Operation was undertaken that evening and an attempt made to divide the septum which had been shown to separate the rectum from the anal canal. This, however, proved impossible owing to the narrowness of the orifice and the distance of the septum from the anus, so an iliac colostomy was performed. A considerable amount of fluid was found in the peritoneal cavity. There was a recurrence of vomiting later the same night and the stomach was washed out, but the child died in the early hours of the morning.

### CASE II

This child, with its mother, was transferred to the Northern Hospital from the hospital in which the birth had taken place; transference was for the mother's convalescence. Birth had been by forceps delivery, and the infant had apparently been considered quite normal and its condition satisfactory. It was apparently a 40-weeks baby, and weighed 8 lb. 1 oz. at birth. It was receiving three-hourly feeds at the breast. The day after arrival at this hospital the infant was obviously ill. Its weight had fallen to 7 lb. 5 oz., its colour was poor, and the abdomen was distended. On examination it was at once seen that no anal orifice existed. This fact had apparently been missed previously owing to the napkins having been stained with meconium, which, it now appeared, was being passed via the urethra.

Immediate operation was performed under ether anaesthesia and an attempt made to find the lower end of the bowel through a cruciform perineal incision, but it soon became evident that no rectum existed at all. While on the operating table meconium was passed from the penis. An iliac colostomy was therefore performed, but the child's condition continued to deteriorate and it died the same night.

At the necropsy there was complete absence of the rectum, and a fistula existed between the lower end of the bowel and the membranous urethra. A dissection of the affected organs was made and mounted, and subsequently accepted by the museum of the Royal College of Surgeons.

### COMMENT

The first of these cases illustrates the type of imperforate anus in which a complete membranous septum persists between the post-allantoic gut and the proctodaeum. Case II belongs to the group in which the original communication with the cloaca persists—associated, as is usually the case, with non-development of the post-allantoic gut.

I wish to record my thanks to Dr. A. G. Wilkinson for permission to publish Case I; to Dr. Björkgren under whose care Case II was admitted to this hospital and who diagnosed the condition; to Mr. W. Rothwell, who performed the operation and made the post-mortem dissection; and to Dr. G. A. Borthwick, medical superintendent, Northern Hospital.

Northern Hospital, N 21

IAN A. J. MCCREADY, M.R.C.S.

It is reported from Berlin that a single fruit of a specific Bulgarian white rose contains about 4,000 to 5,000 mg. vitamin C. This (according to *Svenska*, Aug. 24, 1943) is a sensational discovery, as hitherto the quantity of vitamin C in vitamin-bearing plants ranged from 400 to 1,000 mg. At the same time, a new method of vitamin extraction has been introduced in Bulgaria, and it is expected that this industry will revolutionize the economic life of that country. The dried seeds are to be compressed into tablets, each of which will contain 20 mg. vitamin C.

## Reviews

### MODERN STATISTICS

*The Advanced Theory of Statistics.* By Maurice G. Kendall, M.A. Volume I. (Pp. 457. 42s.) London: Charles Griffin and Co., 1943.

The 457 quarto pages of vol. I of Maurice G. Kendall's book bring back vivid memories to a reader whose statistical education began more than 40 years ago. Even at that time the mathematical literature of the theory of probability was already large; a good deal had been written which those whose formal education in mathematics had been elementary found difficult reading. But textbooks in the titles of which the word "statistics" or "statistical" appeared were descriptive and arithmetical rather than algebraical. In the 40 years general mathematical education has been improved. A youth who has reached the standard of a Higher School Certificate in mathematics may not have much more difficulty in reading Mr. Kendall's book than his father, or grandfather, with equivalent training, had with Todhunter's *History of the Mathematical Theory of Probability* and—this is the essential difference—will cover a much wider field of practically important knowledge.

The columns of a medical journal are not the proper place, even were the reviewer a proper person, for a critical analysis of a primarily mathematical treatise. But as the medical profession numbers in its ranks men of varied non-professional learning, and as statistical analysis has become an orthodox method of medical research, it is proper to indicate the scope of the book and the change in the intellectual attitude of statisticians which it illustrates. A reader of a mathematical book has two difficulties: the writer may assume knowledge of methods and results the reader does not have; he may use a notation or a calculus which is unfamiliar. In this book the difficulties are rather of the second than the first class. We think that an amateur who reads carefully a pamphlet by the late H. E. Soper entitled *Frequency Arrays* (published by the Cambridge University Press in 1922) would find Mr. Kendall's exposition easier to follow. We should add that Mr. Kendall follows the admirable example of Karl Pearson—viz., provides arithmetical examples wherever possible.

Comparing past with present, summarily, we may note that the great pioneers of half a century ago, particularly Karl Pearson, were empiricists in the best sense of the term. Their new methods were powerful instruments, but their logical justification of them was much less complete than we, their pupils, or perhaps they themselves, supposed. It is indeed certain that Karl Pearson did not suppose he had placed the method of moments upon a wholly satisfactory basis of mathematical logic, but his pupils were often free from doubts. A comparison of Pearson's article in *Biometrika* (1902, 1, 265) with Mr. Kendall's 4th chapter, especially pp. 105 *et seq.* shows how far we have travelled since 1902.

But that does not mean the debt to Karl Pearson is small and that those medical biometricians who "fit" by moments are wasting their time. A natural association of ideas leads one to compare the editorial on probable errors of frequency constants in the second volume of *Biometrika* (1903, p. 273), which was the model we admired 40 years ago, with Mr. Kendall's 9th, 10th, and 11th chapters. We know now, among other things, that it is not quite so easy to evaluate sampling moments as we had thought, and that moments are not the most useful functions to study. Here we might remark that a reader coming fresh to *k*-statistics would find a little book by the late P. A. Macmahon (*An Introduction to Combinatory Analysis*, C.U.P., 1920) helpful. Macmahon wrote this booklet (71 pages) as an introduction to his large treatise: the modern history of statistics shows how wise was Macmahon's own remark that "the theory of probabilities is to a large extent concerned with and dependent upon the enumeration of combinations subject to conditions, and almost every theorem in combinatory analysis has its application to that theory" (*Combinatory Analysis*, vol. I, p. vi). We are, however, diverging from the general to the particular. The remaining chapters of Mr. Kendall's book, treating of association

and contingency, product moment correlation, partial and multiple correlation, and rank correlation, will not be too hard reading for those who have had practical experience of the methods and already studied an elementary textbook.

While, as said at the beginning of this review, we have no pretension to give judgement on a work primarily addressed to a mathematical public, we have no doubt of its value and are sure that many medical statisticians who are not mathematical experts could read it with profit if they will take hints we have given as to preliminary study, and to read slowly. It is not a book for hasty perusal.

There is a good deal to be said for statistics, in the most general sense of the term, as a source of intellectual pleasure appealing to a wide range of tastes and natural aptitudes. To some its chief merit is as a method of research which can be applied without access to a laboratory; to others it is an opportunity to test imagination and a sense of logical consistency. Mr. Kendall appeals more to the second class; but students of the former class—no doubt a majority of medical readers—will find in the book danger signals intelligible enough even if the proofs that there is danger may be hard to follow. We wish Mr. Kendall equal success in the second part of his undertaking.

M G

### STUTTERING

*Stuttering: Significant Theories and Therapies.* By Eugene F. Hahn (Pp. 177, 12s.) California: Stanford University Press, London: Oxford University Press, 1943.

This book consists of a collection of short essays or descriptions setting forth the views of numerous writers on the causation and treatment of stuttering. These writers include eighteen American authorities and eight European, among whom are Austrian, English, French, and German exponents. As each essay consists of about half a dozen pages and often less it is evident that the book does not lend itself readily to a review. There is, however, a large consensus of opinion that the underlying cause is some form of mental conflict, and that some form of psychological treatment is therefore a necessary basis to the successful management of such cases. On the other hand, there are those, such as Dr. Walter B. Swift, who seek a conscious process rather than the subconscious processes of the psycho-analysts as the cause, but all are agreed that stuttering is a neurosis. If it is permissible to mention a few of the essays which carry most conviction by their simple scientific approach to the subject, those by Dr. Meyer Solomon and Dr. Lee Edward Travis stand out prominently. This book should certainly be helpful to speech therapists who deal with stuttering, and its value is increased by the inclusion of a useful bibliography.

### INJURIES OF THE FACE AND JAWS

*Synopsis of Traumatic Injuries of the Face and Jaws.* By Douglas B. Parker, M.D., D.D.S. (Pp. 334; illustrated, 22s. 6d.) London: Henry Kimpton.

Now that so many American oral surgeons are with us in this country it is both interesting and stimulating to follow the progress of their maxillo-facial surgery and compare their technique with ours. The American doing this work is first and foremost a dental surgeon who has had a specialized training and experience in facial and jaw injuries and undertakes the operating, much of which in this country would be done by the plastic surgeon. Hence Dr. Douglas B. Parker's approach to the subject is that of the oral surgeon who takes full responsibility and charge of the patient.

This is a useful book for anyone who has had no previous experience in this branch of surgery, and it gives a sound introduction to principles employed in the treatment of these tragic injuries, without wasting space on the details and construction of the more complicated splints and methods of stabilization. Much of the terminology is different from ours, and such phrases as "automotive accidents" and "fistic encounters" may sound strange, but the text is clear and concise. The illustrations and diagrams are excellent, and should be better still in later editions when material from the present war can be added. The early chapters deal with anatomy and surgical technique, and the diagrams on suturing deserve special praise. The section on the stabilization and treatment of fractures differs little from that taught in this

country. We look forward now to seeing our American colleagues over here at work and will observe their maxillo-facial technique with interest.

### Notes on Books

*Methods for Diagnostic Bacteriology*, by ISABELLE G. SCHAUB and M. KATHLEEN FOLEY (Henry Kimpton; 18s.), is a useful bench book describing the methods employed at the Johns Hopkins Hospital. The second edition has been amplified by a chapter on the identification of pathogenic bacteria by their colonial characters; otherwise it follows the same plan as before, instructions being given first for the examination of various kinds of specimen, and later for the further study and identification of bacteria cultivated from them. Final chapters deal, as before, with serological methods and the preparation of culture media and stains.

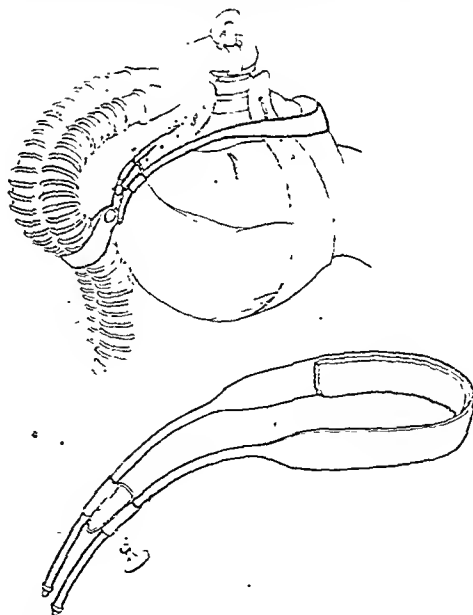
The National Smoke Abatement Society has published in pamphlet form the *Proceedings of the London Conference, 1943*, on smoke prevention in relation to plans for post-war reconstruction. The price is 1s. and it is obtainable through booksellers, or direct and post free from the National Smoke Abatement Society, Chandos House, Buckingham Gate, London, S.W.1.

### Preparations and Appliances

#### ANAESTHETIC FACEPIECES: DEVICE FOR PROMOTING AN AIR-TIGHT FIT

Dr. H. J. V. MORTON writes from Hillingdon County Hospital, Middlesex:

The device represented in the accompanying sketch assists very considerably in procuring an air-tight fit between the anaesthetic mask and the patient's face. It can be adjusted to bring pressure to bear at the points where leakage usually occurs, and is particularly useful if one is forced to use an inefficient facepiece or when a patient's physiognomy is unusual.



The method of use in conjunction with a standard Clausen's harness is clear from the diagram. Two studs in the harness make for increased adaptability.

The usefulness of this simple device in closed-circuit anaesthetics, especially when cyclopropane is being used, is evident. In the majority of cases the tension on the rubber band also assists in "holding up the chin." It should always be used with an appropriate airway in position.

The appliance can be obtained from Medical and Industrial Equipment Ltd., 12, New Cavendish Street, London, W.1.

## NEUROSIS AFTER WAR SERVICE

## REHABILITATION AND RESETTLEMENT

The eighth medical conference of the Ex-Services Welfare Society was held on Feb. 8, with Lord HORDER presiding in the morning and Prof. J. LE FLEMING BURROW in the afternoon. A general discussion on neurotic illness in men discharged from the Services and their settlement in industry was opened by Col. THOMAS TENNANT of St. Andrew's Hospital, Northampton. Experience had shown, he said, that certain types of neurotic and even of psychotic illness responded to a comparatively short period of treatment, while in other types equilibrium could be maintained only by a long period in a sheltered environment. The disadvantage of institutional treatment was that the patient was separated from his home, supposing his home environment to be favourable. If the plans suggested for the development of post-war psychiatry materialized, neuro-psychiatric units would be established in many parts of the country, and might be used in the same way as the Maudsley in London.

Dr. AUNREY LEWIS said that the problem of the neurotic or psychotic individual should not be separated from that of physical disablement. The neurotic man should be regarded as having only a temporary disability, and every effort should be made to avoid conflict between him and the other men with whom he associated in industry. There was some foolish prejudice against neurotics, and they, more than any other disabled type, were open to the suspicion of malingering; they were also more liable to recurrence after apparent recovery. Not only were more psychiatrists needed, but a better distribution of those available.

## Absorption into Industry

An interesting contribution was made to the conference by Dr. E. MOIR (senior medical officer, Ford Motor Company), who said that his experience of the absorption of psychotic and neurotic ex-Service men into industry led him to feel that they should be put to work in normal surroundings under suitable supervision as soon as possible. Sheltered industries in some cases were necessary, but they tended to become sick bays. They reminded the patient that he was still a sick man. His case called for the united efforts of the psychiatrist, the general practitioner, and the industrial medical officer. In the Tomlinson report the works doctor was mentioned only once, and then by analogy, and the general practitioner was, not mentioned at all. It would be well if every G.P. held a part-time industrial post. An eminent psychiatrist had said that he could discharge half his patients if their home conditions were satisfactory, and it was the G.P., knowing the home conditions, with the industrial medical officer, knowing the working ones, who together should encourage them along the path of recovery.

Brig. J. R. REES said that the problem called for the sociologist as well as the clinician. He addressed himself in particular to the question of pensions. There must be a certain number of cases in which, although the man might have had a predisposition before entering the Service, the excessive strain of warfare had made his condition really attributable to the Service in the sense that his breakdown would never have occurred had he remained in normal surroundings. In such cases a pension might legitimately be granted, but he was sorry that it should be necessary even in those, because pensions were extremely bad for the neurotic case. Dr. STRÖM-OLSEN deplored the dearth of social workers in association with psychiatric clinics.

Dr. J. F. E. PRIDEAUX (Ministry of Pensions) said that, taking the cases which were regarded as true war neurosis in the last war—cases in which there had been no predisposition or only a slight one—87% came off the pension list within two or three years after the armistice. He felt that such men could be reabsorbed into industry if the proper steps were taken. There was no doubt that the pension was the worst kind of "therapeutic instrument," as anyone who had treated side by side the serving soldier and the pensioner for the same kind of ailment would agree.

Dr. LOUIS MINSKI pointed out the virtual impossibility of the settlement of a patient in industry so long as his domestic

problems were agitating him. The domestic merited as much attention as the industrial side. He also spoke of the need for the employment of a welfare officer with some psychiatric knowledge by every firm which absorbed such men into its labour force. Col. A. A. W. PÉTRIE referred to the vicious circle created when men were discharged from mental hospitals with 100% disability pension; when, on their gradual recovery, the pension was cut down they became the subject of an acute depressive attack and had to return to the mental hospital.

## A Single Problem

Mr. GEORGE TOMLINSON, M.P., Parliamentary Secretary to the Ministry of Labour and National Service, addressed the conference. Rehabilitation and resettlement, he said, were a single problem; hitherto the two things had been dissociated. He felt that unless the stigma which still clung to the mental hospital could be removed, patients should only be allowed to go there as a last resort. In the rehabilitation of a certain type of neurotic patient the attitude of his employer and of his fellow trade unionists was probably more important than anything else, and in spite of the fact that a Bill had now passed through the House of Commons providing on a compulsory basis for the employment of disabled persons, it was just as essential as ever to get the understanding and co-operation of both sides in industry. The object of his committee (the Committee on the Rehabilitation of the Disabled, of which he was chairman) had been to ensure that the disabled person should be able to obtain his job and keep it on his merits as a worker in ordinary competition with his fellows. That was the only rehabilitation which was really worth while. He sympathized with the protest made by one speaker in the conference against the assumption that the only employment for which a one-armed man was fit was door-keeping or lift-attending, but at the same time it was as well to remember that the loss of an arm did not make a man a genius; he might only be fit for door-keeping or lift-attending if he had retained both arms. Mr. Tomlinson as a trade unionist paid a tribute to the general body of doctors. There had been a good deal of recent trouble over certification, but he felt certain that in many cases the doctor had given a certificate which perhaps was not very explicit and might include some such phrase as "general debility," because he knew that he could probably arrest what was developing in the patient if he could put him "on the club" for two or three weeks.

Prof. BURROW said that part-time help among civilian by psychiatrists now serving in the Forces would be of very great assistance in the rehabilitation of the cases with which civilian doctors were now called upon to deal. There were too few psychiatrists to give the necessary individual treatment in cases of neurosis.

## TUBERCULOSIS IN INDIA

The fourth annual report of the Tuberculosis Association of India states that there are now 112 tuberculosis clinics and 66 tuberculosis hospitals and sanatoria in that country, with a total of over 4,000 beds. In addition there are more than 1,200 beds for tuberculous patients in general and isolation hospitals, and over 700 for tuberculous convicts in prisons. One of the most noteworthy institutions in India is the New Delhi Tuberculosis Clinic; at which, during the latest year, 2,240 persons were examined, nearly half of whom were found to be suffering from the disease. The Lady Lialitigow Sanatorium at Kasauli, with 136 beds, is also doing excellent work and is becoming known, the number of applications for admission greatly exceeding the number of beds available. Patients are admitted to this institution from all parts of India without distinction of race or caste. There are now affiliated with the Tuberculosis Association fourteen Provincial and five State associations, the latest to be formed being in the States of Hyderabad, Bikaner, and Rampur.

On the basis of the treatment of 50 typhus cases with convalescents' blood, Pfeiffer and Gauserky (*Klin. Wschr.*, 1943, 22, 48) state that favourable results are produced by it. The principal effects are shown in a shortening of the period of fever and less severe central nervous symptoms. The mortality in cases which have been transfused is less than in those without transfusion. It is sufficient, they state, to make a single transfusion of 200 ccm of convalescent blood, and this ought to be done at the beginning of the case.



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## THE WHITE PAPER

By now all doctors in this country will have some idea of the proposals in the Government White Paper on a National Health Service, published last week<sup>1</sup>; and soon everyone will receive a copy. It is hoped that everyone will read and re-read this so as to grasp in both broad principle and narrow detail just what is the very fully considered view of the Government on an issue of first importance to the people of the country and to the medical men whose task it is to care for them in health and in sickness. It should be made clear at the outset that the White Paper, which is designed to meet the demand of the Beveridge report for a comprehensive medical service is "concerned exclusively with the direct services of personal health care and advice and treatment." It is not concerned with the environmental health services, nor with the school service, nor with the industrial medical service. The main reason for change," it is stated, "is that the Government believe that, at this stage of social development, the care of personal health should be put on a new footing and be made available to everybody as a publicly sponsored service." It is considered that the people of this country should come to look upon the public provision of a comprehensive personal health service as much a communal provision as the provision of good highways or a clean and safe water supply. The service is to be available to everyone in the community who wishes to avail himself of it, and it is to be free, payment for it coming out of taxes, local rates, and the insurance contribution under the social security scheme. It is to be complete. The service is to be founded on the "family doctor" idea; there is to be freedom for people to use or not to use the facilities made available; there is to be no compulsion into the new service either for patients or for doctors; there is to be freedom for entering into private arrangements at private cost; the patient is to be free to choose his doctor. With these general principles the profession are in agreement. The idea of a comprehensive service based on the personal relationship between patient and doctor, with no financial barrier between it and the patient, is one which the B.M.A. has consistently held before the profession.

The White Paper, written in attractive and lucid English and free from verbal ambiguity, recognizes that "there is a certain danger in making personal health the subject of a national service at all. It is the danger of over-organization, of letting the machine designed to ensure a better service itself stifle the chances of getting one." It recognizes that the object of organization is to ensure that the service is available, and that it is a good service. Organization is a means, and not the end. The

form of central organization favoured by the Representative Body is not accepted, and the reasons for continuing the responsibility to Parliament of a Minister, the head of a Department of Health, are briefly given. For Scotland the responsibility would be that of the Secretary of State. At the side of the Minister there will be set up a statutory Central Health Services Council, which will have no executive powers but the duty to advise the Minister on the technical and professional aspects of the service. It will also have the power to initiate advice on matters it holds to be of importance. The Minister will submit an annual report to Parliament on the Council's work. It is proposed that this body shall be made up largely of medical men, and that experts' advice on the other aspects of the health service must also be available, through, for example, hospital administrators, nurses, dentists, pharmacists. It is not contemplated that the work could be regularly done at single meetings of the full Council, but that it should establish small groups or subcommittees out of its provisional 30 or 40 members, who will be appointed by the Minister in consultation with professional and other organizations. The Council will elect its own chairman and regulate its own procedure, and will be provided with a secretariat. At the periphery there will be corresponding Local Health Services Councils.

The other central administrative structure is the Central Medical Board, small in size, composed mainly of members of the medical profession, some giving the whole of their time to the work and others part of it, acting under a permanent chairman, and working under the general direction of the Minister. The Central Medical Board will be an executive body. It will conduct the day-to-day central working of the public general practitioner service; will be the body with which the practitioner makes and ends his contract; will be the agency through which young doctors will obtain appointments as assistants; will control the distribution of general practitioners in accordance with population needs; will act as a sort of central bureau for giving advice and assistance to doctors in the public service; will arrange for postgraduate and refresher courses; and will be the central body and clearing house to which the new Joint Authorities will make known the medical needs of their local areas. It is plain that this small central body established in the Ministry of Health will have very important and powerful functions in relation to the conduct of medical practice.

As it is proposed that the general practitioner service is to be administered centrally, while the hospital service is to be administered locally, we shall first of all briefly review the proposals for the general practitioner service before discussing local administration. The report barely glances at the National Health Insurance scheme. It is allowed to pass with a few lines of obituary notice, and with it go the Insurance Committees. The White Paper gives reasons for not meeting the need for a comprehensive service by extending the panel system "to the whole population and expanding it to include consultant and specialist services." The first reason given is that at present there is no effective way of ensuring a proper distribution of doctors. The second is that developments

<sup>1</sup> A National Health Service, Cmd. 6502. H.M. Stationary Office. (J.S.)

of modern medicine "point the way to changes which need encouragement and experiment in any future service." As already stated, the doctor in the new general practitioner service will be in contractual relation with the Central Medical Board, which will be responsible for paying him. This board will take over most of the functions of the Insurance Committees, and will "discharge many of the minor day-to-day functions through a local committee or similar agency, on which there will be included members of the local authority in each area." The complete medical needs of any area will be determined by the new Joint Authorities of county councils and county borough councils which will administer the area hospital service. It would be for the Central Medical Board to act on the advice thus presented to it. The local Joint Authority will have to "provide for the linking of general practitioners . . . with a hospital, consultant, and other services in the area."

The Government put forward proposals for two kinds of general practice—namely, "grouped general practice" and "separate general practice." The new service is to be designed so as to give full scope for trying out the method of organizing medical practice by groups of doctors either in the special premises of a health centre or without such special premises—the latter presumably means on the basis of multiple partnership. It recognizes that experiment with different types of centre is necessary, and regards the object to be "to provide the doctors with first-class premises and equipment and assistance and so give them the best facilities for meeting their patients' needs. The doctors will thus be freed from the necessity to provide these things at their own cost." The general scheme is to make available individual consulting rooms and space for simple laboratory work, for nursing and secretarial staff, recovery and rest rooms, facilities for minor surgery, and so forth. These centres are first to be introduced in selected areas, and it is observed that a big factor will be the wish of local doctors to bring their work into the new centres; "but in the last resort the decision will rest on the requirements of the public interest." If the new Joint Authority decides that a health centre is necessary it will be the responsibility of the individual county or county borough council to provide it. Therefore the appointment of a doctor to the health centre will be made jointly by the Central Medical Board and the local council which administers it. The local council will provide the premises, the equipment, and the ancillary staff. "It seems fundamental," the Paper states; "that inside a centre the grouped doctors should not be in financial competition for patients. All the practical advantages of the centre . . . will be, under a system of a salaried team, at the disposal of the group in whatever way they like collectively to arrange. . . ."

In the "separate" general practice envisaged it is proposed to retain the general framework of the National Health Insurance scheme. Practice will be conducted as at present, but the doctor "will be backed by the new organized service of consultants, specialists, hospitals, and clinics." He will be paid from public funds on a capitation basis, but it is considered that in some circumstances

"it will be possible to remunerate the practitioner on a salaried or similar basis if he so desires." If a practitioner wishes to take over an existing public service practice or to set up a new one he must first seek the consent of the Central Medical Board, which may withhold this if it thinks that there are enough doctors in the area, and that other areas need more doctors. "The Board will thus be able to help the new Joint Authorities which, in their general concern with the health services of their area, will turn to the Board to encourage or discourage any further increases in general practice in the area." The Government makes the welcome proposal that newly qualified doctors leaving hospital should first of all go through an apprenticeship as assistants to more experienced practitioners, either at a health centre or in a separate practice. "The Board must also be able to require the young doctor during the early years of his career to give his full time to the public service where the needs of the service require this"—a requirement which seems to conflict directly with the general principle of "no compulsion into the new service, either for patient or for doctor" (our italics). It is recognized that the adoption of the White Paper proposals will destroy the value of some existing practices, and that compensation for this must be paid. An "efficient super-annuation system" is looked upon as a part of the health centre organization, but as something more difficult to institute for doctors in the separate practices scheme.

The Government intend to base the local administration of the new service on existing county and county borough councils. In most cases suitable hospital areas will be larger than the areas controlled by existing major local authorities. It is therefore proposed to combine existing county and county borough councils in joint boards for the larger hospital areas yet to be defined. In some cases an individual council may have under its jurisdiction a large enough hospital area, and therefore will remain unchanged. The new Joint Authority, as already mentioned, will have the duty of surveying the complete health needs of the area under its control. Just as there is to be a Central Health Services Council constantly advising the Minister, so are there to be Local Health Services Councils advising the new area authority. The Local Health Councils will advise on all matters referred to them by the Joint Authorities or other local authorities in the area, and also will have the right to initiate advice and to submit their views both to the local authorities and to the Minister. Once local needs are determined, the Joint Authorities will be to provide hospital services through the municipal institutions owned by them (and previously owned by the constituent councils), and through the voluntary hospitals the aim being to make each area as self-sufficient as possible. Sanatoria, fever hospitals, and mental hospitals will be transferred to the new Joint Authority, which, too, will take over those clinic services essentially of the nature of out-patient units—for example, tuberculosis dispensaries, mental clinics, and cancer diagnostic centres. The Government wish to make it possible for the voluntary hospitals to take their part in the service without losing their identity. "If once," it is stated, "the situation were to arise in which the whole cost of the voluntary hospitals

part in the public service (a service designed for the whole population) was repaid from public money, or indeed in which it was recognized that public funds were to be used to guarantee those hospitals' financial security, the end of the voluntary movement would be near at hand." The Joint Authority will contract with the individual voluntary hospital for services rendered in the public scheme, but it is not proposed that the sum paid should be assessed "as a total reimbursement of costs incurred." There is a need for more consultants distributed more widely throughout the country. The general practitioner will secure expert advice for his patient through the consultant employed by the hospital. While it is recognized that the ultimate responsibility for making hospital appointments must rest with those who conduct its affairs, some kind of external appointment machinery for the purpose of making recommendations is thought advisable in order to avoid "the danger of in-breeding." Another aspect of the new hospital service is a hospital inspectorate, composed of "a team of highly qualified medical men," not necessarily employed whole-time on this work. It would seem that the provision of a free service will bring to an end that highly valuable feature of our hospital service—the contributory scheme.

A much fuller survey of the White Paper appears in this week's *Supplement*, but the above summary will provide, it is hoped, some idea of the Government's scheme for a comprehensive personal health service made freely available to every person in the country who wishes to take advantage of it. There are many points of detail which are clearly controversial, and on which the Government expect to be challenged in discussion with professional and other bodies. Certain broad general conclusions may, however, be drawn at this stage. Throughout this well-written and for the most part unambiguous report is a clear recognition of the realities of the present situation. Even if it were agreed that a general practitioner service based on a health centre was the most desirable way of conducting the work of the family doctor, and even if it were agreed just what was the most suitable form for these centres, it would obviously take a long time before they could be set up even in the more densely populated areas of the country, and it would obviously be long before there were enough doctors available to man them throughout the country. Hence it is clear that in the meanwhile "separate general practice" would have to be carried on. For the moment, then, those who are opposed to the idea of a whole-time salaried State Medical Service have had their fears allayed. But it is important to recognize in the White Paper the unmistakable direction in which the mind of the Government is moving—and that is towards the institution of a whole-time salaried medical service, with the proviso that private practice shall not be denied to those who want it and that doctors in the public service may provide it. It would seem evident that the person who is paying for a free medical service through central taxation, local rates, and a social security contribution may find that private practice loses much of its attraction even if he can afford it. Similarly it would appear that private benefactions and contributions to

voluntary hospitals, and certainly financial support through contributory schemes, will begin to dry up. It is difficult to see how, in the kind of evolutionary changes which are so persuasively outlined, private practice as we know it to-day can survive as much more than a shadow of itself. There are parts of this report which will need careful scrutiny before their implications can be fully understood. For example, it does not seem to be intended that health centres should be really experimental in the early stages. They seem to be wanted, at least by the authors of this report, not so much for what they may be as for what they make possible—first steps towards State control and salaried employment. Again, if only practitioners entering health centre practice are to be compensated the result will be an immediate fall in the value of all practices. The report, having stated that the Central Medical Board should have power to prevent doctors entering an "over-doctored" area, goes on to suggest that no one should practise anywhere without first obtaining permission of the Board—a civil service structure which is to have power to direct newly qualified practitioners to whole-time public service. There is more than a hint here of authoritarianism. If this is to be read as a way of introducing a salaried medical service the proposal will be resisted to the full. In its early pages the White Paper enunciates principles which, to a great extent, have long been accepted by the medical profession. The profession will have few points of disagreement with the Government if these principles find expression in details of organization. If the discussions and negotiations are permeated by the spirit of the principles enunciated by the Government on page 47 of the White Paper, we believe it will be possible to evolve a comprehensive medical service on the basis laid down. But we detect a thread of argument and development leading in a direction which the profession refuses and will refuse to follow—that of whole-time salaried service under the State. If this interpretation is correct, it is useless to deny that there is trouble ahead.

### NUTRITIONAL NEUROPATHIES IN SPAIN

The tragic civil war in Spain produced famine conditions throughout the country. The greater part of the population of Madrid lived from August, 1937, till February, 1939, on such meagre rations as 1,060 calories a day and 34 g. of protein, of which only 22% was of animal origin. It is not surprising that an "epidemic" of nutritional deficiencies developed. The diet was especially low in the vitamins of the B complex, and caused deficiency symptoms which could be traced back to their lack. Peraita<sup>1</sup> reports his experiences of these years in Madrid, especially of the winter months in 1937-8, when many patients suffering from pellagra with psychological disorders were observed. The most interesting part of his observations is the description of neurological symptoms without pellagic skin lesions. Peraita was able to classify these cases into distinct groups; according to his view they are clearly related to a deficiency of the vitamin-B<sub>2</sub> complex. Under the difficult conditions of those days he was

<sup>1</sup> *Arch. Psychiat. Nervenkrankh.*, 1942, 114, 611.

able to study 300 patients suffering from various symptoms of vitamin-B<sub>2</sub> deficiency, and treat them so far as his limited medical resources allowed. One-third of the patients had psychological disorders; another third, apart from neurological symptoms, also had pellagic lesions of the skin. It is, however, the last third of the patients, comprising 98 cases, which he deals with in greater detail. These patients had neurological symptoms only and no skin lesions. Females predominated in a ratio of 4:1, persons of 40 to 60 years of age being in the majority. Peraita classifies this group as follows: paraesthetic syndrome, paraesthetic-causalgic\* syndrome, retrobulbar neuritis, funicular myelopathy, cochlear neuritis, mixed forms, and transitional forms, leading to the classic picture of pellagra. Similar symptoms were also observed in conjunction with characteristic pellagrous skin lesions.

The paraesthetic syndrome started often as tingling sensations in the distal parts of the toes and round the bed of the nails, and later spread to other parts of the foot. There were patients who suffered from similar sensations in their hands. A more serious disturbance was a very painful dysaesthesia, the patient suffering from pains similar to those described after injury of peripheral nerves (the so-called "paraesthetic-causalgic syndrome"). Special sensory disturbances, such as feeling of "cold and wetness" of the feet, burning sensations, and so on, were described. In the group classified as "funicular myelopathy" the symptoms were those due to damage of the posterior sensory spinal tracts, such as absence or diminution of the vibratory sensation and ataxia of a pseudo-tabes type. Little or no disturbance of the function of the efferent nerves was noted. The ankle- and knee-jerks were rarely diminished, but more often increased. Other symptoms were of a general character, including weakness, inertia, depression, "neurasthenia," and disturbances of sleep and of the heat regulation. Disturbances of bladder function appeared as a "miction impérieuse," polyuria, nycturia, to a complete paralysis. Many of Peraita's patients had a generalized hypohidrosis. Amenorrhoea or oligomenorrhoea was a constant finding. Erythema pernio, erythromyanosis crurum puellaris, and other trophic disturbances were seen, and responded well to dietetic treatment. All these changes could be brought to a common denominator—namely, to changes of the sensory and neuro-vasomotor system of central or peripheral type.

Treatment with yeast led to recovery. On the other hand, administration of crystalline vitamin B<sub>1</sub>—possible in only a few patients because of limited supply—did not cause the same rapid improvement as regular dosing with dried yeast. For these and other reasons, among them the clinical picture, Peraita suggests that the symptoms described are due not to a vitamin-B<sub>1</sub> deficiency but to a deficiency of the vitamin-B<sub>2</sub> complex. He groups them all under the heading of pellagra, which he prefers to call Casal's disease, since the term "pellagra" is associated with the characteristic lesions of the skin, colitis, and other typical symptoms which were observed in Madrid in only relatively few cases. Peraita admits that the few patients whom he treated with pure nicotinic acid did not respond so well as to yeast therapy, although the typical pellagic lesions were cured. The neuropathies described might be

due to deficiencies of other members of the vitamin-B<sub>2</sub> complex, but riboflavin proved to be therapeutically inefficient. The significance of Peraita's findings is obvious.

The cruel involuntary "experiment" of the dimensions experienced in Spain provided evidence of types of neurological disorder caused by nutritional deficiency of some sort or another. This same "experiment" is, unfortunately, to be expected on an even larger scale in Europe after the war. The appearance of classical pellagra in Madrid, where the population never ate maize, put nicotinic-acid deficiency on a firm aetiological footing: quick response to treatment with nicotinic acid clinches the matter. Peraita's clinical classification brings some kind of order into the tangle of the symptoms met with, and will certainly help prospective workers in the nutritional field in post-war Europe. It may, however, be an advantage to dissociate these nutritional neuropathies from the classical picture of pellagra, the clinical symptoms of which clear up with nicotinic acid. Further studies will show beyond doubt which of the factors of the vitamin-B complex is responsible for the various symptoms described by Peraita. Meanwhile we must rope them in under some such general description as "nutritional neuropathies due to vitamin-B-complex deficiency," realizing that such syndromes will complicate the well-known "classical" nutritional deficiencies, one of which is pellagra. This is important, apart from anything else, because symptoms like those described by Peraita have been ascribed to vitamin-B<sub>1</sub> deficiency.<sup>2</sup> A beneficial effect of coenzyme (thiamine pyrophosphate) on neuropathies of the motor and sensory nerves associated with pellagra has been reported by Lewy, Spies, and Aring.<sup>3</sup> Similar scattered reports of the effect of vitamin B<sub>6</sub> and pantothenic acid on certain neurological and psychological disorders in pellagra have also appeared, but so far have not been confirmed. It will be the task of workers on post-war relief in Europe to ascertain more critically and clearly whether deficiencies of any of these members of the vitamin-B complex play a significant part in the causation of disease in man and are responsible for some of the symptoms described by Peraita.

### THE DECLINE OF AIR-BORNE INFECTIONS

It is a good thing from time to time to sit down and consider in the broadest and most general way what we are trying to do by our efforts to combat disease. Anyone who has reflected in this way about infectious disease must have grasped the fact that two policies are being pursued, either of which if completely successful would remove all need for the other. They are immunization and the elimination of the micro-organism—that is, rendering the individual resistant to infection, or ensuring that he shall not encounter it. The merits of these two policies are among the very large questions discussed by Dwight O'Hara in his monograph entitled *Air-borne Infection: Some Observations on its Decline*,<sup>4</sup> a slim volume published by the Commonwealth Fund in which the reader will find much food for thought. The author's chief raw material is the mortality statistics of the State of Massa-

<sup>2</sup> N. Jolliffe in *The Biological Action of the Vitamins*, edited by E. A. Evans, 1942, p. 44, Chicago.

<sup>3</sup> *Amer. J. med. Sci.*, 1940, 199, 840.

<sup>4</sup> Oxford University Press. (8s. 6d.).

chusetts since 1900, and his text is printed on the dust-cover—a graph showing a steady decline in the annual deaths from each of four principal diseases of the respiratory tract. That the main cause of this happy decline is improved standards of living—better housing and better food in particular—rather than the efforts of the hygienist and immunologist, is a conclusion perhaps unpalatable to some branches of medical science but nevertheless inescapable. The choice between immunization and the elimination of infection is a problem to which the author gives a qualified answer: it depends very much on the infection. In general, immunity is the more reliable safeguard; but both methods should be employed, and there is an optimum point for each disease at which they should be balanced. The whole idea of any policy of elimination, however, seems to be undermined by the author's ideas about cross-immunity. He regards loss to industry by the common cold as time well spent, since but for this the population would become susceptible to something worse: colds "keep us from becoming immunologically soft." This is a doctrine of profound importance, amounting to a confession that complete and perpetual health is an impossibility. There are other somewhat speculative judgments. Not everyone, for instance, will agree with the author's condemnation of using convalescent serum to modify measles in a healthy child, and is it generally agreed that a cold-virus collaborates with the pneumococcus in initiating the attack of lobar pneumonia? The statistical information on which this monograph is based is singularly complete and embraces many points of interest, such as the high frequency of pneumonia among hospital interns, particularly on the medical side. The author writes interestingly and sometimes vividly. Thus, in his words, a community shielded from infection acquires "a susceptibility which has some of the qualities of gunpowder." Of neglect of opportunities for health he writes: "Nature does not discriminate between those who are unable and those who are unwilling." This thoughtful and far-seeing essay on a major problem of public health should be widely read, not only for the information and deductions which it contains but as an instrument for enlarging the vision.

#### PROBLEMS OF AGEING AND CARE OF THE AGED

The Nuffield Foundation Trustees (in development of one of the objects specified by Lord Nuffield) are undertaking a survey of the problems of ageing and the care of old people. The Ministry of Health and the Assistance Board have warmly welcomed the proposal and will co-operate in the conduct of the survey. The object is to collect and collate as much information as possible with regard to: (1) The problems—individual, social, and medical—associated with ageing and old age. (2) The work being done by public authorities and voluntary organizations, and the public and private resources that exist, for the care and comfort of old people in Great Britain. (3) The provision made for old people in those countries which have given special consideration to these problems. (4) Medical research on the causes and results of ageing. (5) The lines on which action might usefully be taken in the future by public authorities and private organizations, including the Foundation. The chairman of the Survey Committee is Mr. B. Seebohm Rowntree, and the medical members are Dr. A. D. Briggs, medical superintendent, Stobhill Hospital, Glasgow, and Dr. Aubrey Lewis, director of clinical research, Maudsley and Mill Hill Hospitals. Questions of medical research will be considered by a special subcommittee, consisting of Dr. A. Greig Anderson,

physician, Aberdeen Royal Infirmary; Dr. A. D. Briggs; Dr. Aubrey Lewis. Dr. A. S. Parkes, F.R.S., National Institute for Medical Research, Hampstead; and Dr. J. H. Sheldon, hon. physician, Wolverhampton Royal Hospital. The secretary to the Survey Committee is Mrs. N. M. Windett, B.Sc. (temporary address: 73, Great Peter Street, S.W.1). In questions of ageing and the care of the aged there is lack of collated information of a comprehensive and authoritative nature. This militates against due appreciation of the problems and hinders the search for adequate solutions. The survey now being undertaken should contribute to a better understanding of a social problem which will inevitably become more prominent in public thought and policy. It will also give the Nuffield Foundation a basis upon which to decide its future action with regard to the care of old people.

#### CENTENARY OF THE MEDICAL DIRECTORY

In the year 1825 John Churchill, grandfather of the present managing director of J. and A. Churchill Ltd., Mr. A. W. Churchill, M.A., started his business career. Among his early publishing activities were the famous series of manuals on medical and surgical subjects. The first of these was entitled *The Anatomist's Vade Mecum*, by Sir Erasmus Wilson, and was followed by Sir William Fergusson's *Manual on Surgery* and by many others. These proved to be the forerunners of the many well-known medical and scientific books of the house of Churchill which have been used by generations of students and practitioners. In 1845 John Churchill published the first edition of the *Medical Directory*. It was a small volume of 700 pages in foolscap octavo size. The 1944 edition is a large royal octavo volume of over 2,500 pages, and contains 70,000 entries (price 63s.). The rapid growth in numbers of the medical profession and the geographical distribution of its members are clearly indicated in tables on the reverse of the title-page. From its first issue the purpose of the *Medical Directory* has been to set out in concise form the professional status of the doctors whose names appear therein. Details are given of the names, addresses, qualifications, appointments, and publications of medical men and women practising in the British Isles, over-seas, and in the Forces. Particulars are also furnished regarding universities, colleges, hospitals, and other institutions, together with miscellaneous data of interest and value to the profession. The centennial volume published this week contains 68,235 names divided as follows: London, 9,366; Provinces, 29,975; Wales, 2,288; Scotland, 7,675; Ireland, 4,693; Abroad, 11,229; Services, 3,027. It also includes near the end of the text the names of 2,682 practitioners who have been temporarily registered in Great Britain in pursuance of an Order made under Defence Regulation 32B. The Late List of new names and changes of address, etc., has been moved this year to a more convenient position—immediately in front of the London section. The publishers are to be congratulated on the hundredth issue of a professional book of reference which in its comprehensiveness has no rival in any other country; moreover, its accuracy has become proverbial. They can justly claim that the modest first edition of the *Medical Directory* was in fact one of the earliest steps towards the co-ordination of all qualified practitioners in the British Isles.

Guy's Hospital has lost two distinguished members of its consulting staff: Dr. John Fawcett, for many years physician to the hospital, and Prof. John William Henry Eyre, M.D., formerly bacteriologist. Dr. Fawcett died in a London nursing home on Feb. 18, and Prof. Eyre at Ivy Hatch, near Sevenoaks, on Feb. 17.



## Nova et Vetera

### MEDICINE IN THE OLD MERCHANT NAVY

At the February meeting of the Section of History of Medicine of the Royal Society of Medicine, with Sir WALTER LANGDON-BROWN presiding, Prof. J. A. NIXON gave a discourse on health and sickness in the Merchant Navy up to the end of the Napoleonic wars.

He dated the beginning of the Merchant Navy to John Cabot's discovery of Newfoundland. Before the discovery of the New World and the undertaking of long voyages by English seamen, the problems of disease and sickness at sea were very much the same as those on land. With long voyages came the need for ship surgeons. In Sebastian Cabot's ordinances for his intended voyage to Cathay in the middle of the sixteenth century there was no mention of surgeons being carried, but in a voyage to the East Indies in 1552 there was a captain's instruction to furnish 200 able persons for the three ships, the persons to include chirurgens. In the last voyage of Drake and Hawkins to the West Indies in the fifteen-nineties, while wintering at Grand Canary, they were attacked by the natives and the surgeon of the ship was taken prisoner. The charter granted to the Barber Surgeons of London by Charles I in 1629 instructed them to examine sea surgeons and to compel any ship sailing from the Port of London to carry a surgeon. If that instruction was literally obeyed, said Prof. Nixon, we had evidently dropped back since those days.

The next legislation for carrying a surgeon on board ship seemed to have been in the 26th year of George III, when the Arctic whalers were compelled so to do by the Act regulating the Greenland fisheries. In 1769 it was enacted that no ship should sail unless there was at least one surgeon on board who could produce a certificate of having passed his examination at Surgeon's Hall or at some public or county hospital or the Royal College at Edinburgh. In the 43rd year of George III vessels carrying 50 persons were required to include a surgeon. There was also an instruction that the journals of such surgeons should be sent to Dr. Hunter (Prof. Nixon thought this was William Hunter) of Charles Street, St. James's. Examination of the journals showed that cholera was classified among nervous diseases.

Of James Cook and his efforts to overcome scurvy Prof. Nixon had a poor opinion. He based his criticism on a letter written by Cook to Sir John Pringle which was read by him at the Royal Society in 1775. In this letter Cook said that he had no great opinion of the juice of lemons and oranges alone, though it might assist among other things. William Scoresby, jun., in his *Account of the Arctic Regions and the Northern Whale Fishery* (1820), mentioned as the diseases of scamen, scurvy, frostbite, asthma, and catarrhs, but added that the last-named were rarely followed by any dangerous consequences.

One curious feature of the vessels which undertook the African slave trade was that the surgeons they carried had to look after the slaves, not after the officers and crew. Indeed, the doctor got a bonus of one shilling for every healthy slave he landed, and one Bristol doctor, in addition to his shillings, got a present of three slaves. In the ships taking the convicts to Australia also great care was taken over ventilation and exercise. By the latter part of the eighteenth century there was constant travelling to the West Indies, a station which had a terrible reputation for sickness, but there was good health on the vessels. Prof. Nixon concluded by quoting from a schoolgirl's letter written from Jamaica in March, 1792, concerning a stormy voyage on which many were ill—"as for the mean sneaking doctor, he was such a coward that he kept in bed."

### Early Literature on Scurvy

At the same meeting Dr. GEOFFREY BOURNE gave some extracts from old literature on tissue changes in scurvy. Scurvy, he said, was known to the ancient Egyptians, as was proved by the hieroglyphs dating from about 3000 B.C. The disease beset the crusading armies of Louis IX before Cairo, and was thought to be due to the fact that the Crusaders had eaten fish which had fed on the bodies of men killed in battle. He quoted many authors, including an Austrian surgeon in 1720 who described the disease in the Imperial troops of Hungary, and made the interesting observation that the officers were less prone to the disease than the men, presumably because they had better diet. The same thing was noticed during the American Civil War, when scurvy decimated both sides. An army surgeon in that war declared that the characteristic premonitory symptom of scurvy was rheumatism.

The earliest record of the effects of scurvy on wounds was made by one Walter, a chaplain to an expedition round the world

(1740-4), who said that the whole body, more especially the legs, was subject to ulcers of the worst kind, and that the scars of wounds which had for many years been healed were forced open again by this violent distemper. Thus a man who, fifty years earlier, had been wounded at the Battle of the Boyne, and had since been well, on being attacked by scurvy found his wounds break out afresh. A number of cases of spontaneous re-fracture of bones were quoted in the eighteenth century.

In some discussion following the two papers Sir DAVID MUNRO referred to the unfortunate Indians who were released after the siege of Kut-al-amara in the last war, and who, he said, presented such starvation, with massive intramuscular haemorrhage, as he had never seen before. Dr. GWYNNE MAITLAND commented on the difference in the requirements in the various Merchant Shipping Acts right down to the present day as to the number of people on board which made it necessary for a surgeon to be carried. Dr. M. T. MORGAN (M.O.H., Port of London) said that quarantine was first established by the overseers of Venice about 1550. These people were working in the dark in the endeavour to stop epidemic diseases from getting ashore from ships, and their measures were extremely drastic. He also mentioned that it was not until 1872 that the Port of London appointed a medical officer specifically to control infectious diseases entering the port; this first officer was assisted by only one sanitary inspector, and that at a time when cholera was epidemic on the Continent. Prof. NIXON said that there was a reference to anti-scorbutics in Thomas Forrest's *Voyage from Calcutta to Mergui Archipelago* (1792), when, in addition to lemons and oranges, he also mentioned the good effect of sprouting peas and beans, which he had learned from the Malays.

### VENEREAL DISEASES IN PEPYS'S DIARY

In a recent paper on this subject<sup>1</sup> Dr. J. D. Rolleston remarks that though the medical aspects of *Pepys's Diary* have been discussed by many writers during the last fifty years, particularly by the late Sir D'Arcy Power, who dealt specially with Pepys's ocular and urinary troubles, no article has hitherto been devoted to the subject of venereal diseases in the *Diary*. The only words used in it to denote venereal disease are "clap" and "pox." The term "syphilis," though first introduced by Fracastor in the sixteenth century, for a long time did not receive general recognition, and during the seventeenth and eighteenth centuries only about a dozen writers used it. Moreover, the terms "clap" and "pox" were often used indiscriminately, the word "pox" being sometimes applied to "gonorrhoea," while the term "clap" meant "syphilis." It must also be borne in mind that "pox" was sometimes regarded not as an independent disease but as the last stage of "clap." In these circumstances, in the absence of characteristic symptoms or sequelae such as *ardor urinae* in the case of gonorrhoea, or necrosis of the nasal bones in syphilis, it is almost impossible to tell what is meant by the colloquial terms "clap" and "pox." Although chancre is probably as old as gonorrhoea, the absence in the *Diary* of a description of the local lesion makes it impossible to determine the nature of the sore, and the same applies to the other forms of venereal disease, so that venereal disease in *Pepys's Diary* must be regarded as indicating syphilis or gonorrhoea only. The high incidence of venereal disease in London, and particularly the Court at the time of the Restoration, is shown in many passages in the *Diary*, the most notable case being that of Prince Rupert, who suffered from syphilitic osteitis of the skull, for which he was trephined by James Moulins, surgeon to St. Thomas's Hospital and afterwards to Charles II and James II, and made a complete recovery. In view of the promiscuous behaviour of Charles II, the possibility of his having contracted some venereal disease naturally arises, but there is nothing in the *Diary* to support this view.

With regard to the prevalence of venereal diseases in the lower classes of society during the Restoration, it is possible that the practice of the City apprentices mentioned by Pepys of pulling down the brothels was a retaliation for infection acquired there. A remarkable epidemic of what was probably gonorrhoea was mentioned by Pepys in the Rawlinsonian collection of his miscellaneous writings. It originated in a girl, aged 14, who infected 400 soldiers, and calls to mind a similar occurrence related by Casanova. Even if, as is probable, the outbreak is somewhat exaggerated, it at least exemplifies the high infectivity of juvenile prostitutes.

Dr. Rolleston remarks that the delay in the appearance of a final and complete edition of the *Diary* which Pepys scholars must regard as one of "the minor horrors of war" will probably end soon after the termination of hostilities. It is therefore welcome news that when a new edition of the *Diary* is published 50 copies will first be privately printed with no omissions and will be presented to the leading libraries, and that the remaining copies will be published with only a few omissions.

<sup>1</sup> *Brit. J. vener. Dis.*, 1943, 19, 169.

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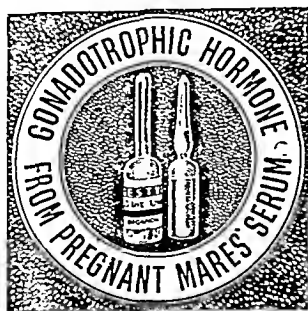
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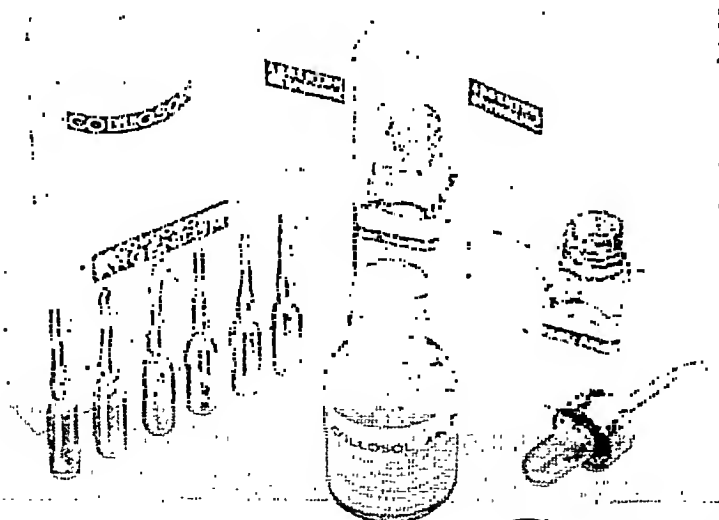
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## Reports of Societies

### VENOUS THROMBOSIS IN THE C.N.S.

A meeting of the Section of Neurology of the Royal Society of Medicine took place on Feb. 13, with Brig HUGH CAIRNS in the chair, when the discussion was on "Venous Thrombosis in the Central Nervous System."

Dr. PURDON MARTIN, in opening, said that Maclewan in his classical work on pyogenic diseases written fifty years ago, declared that venous thrombosis was more common within the cranium than in any other part of the body. That was hardly the case to-day. Half a century ago the condition was recognized as being due to two groups of causes, the first being the so-called "maranese" group, associated with wasting diseases, and the second the infective group. The former group possibly declined first, and although the frequency of infective cases probably declined also, thrombosis in the veins and venous sinuses of the brain continued to be so generally due to infection that to many the title of the present discussion would suggest only the septic thrombosis of the lacern and cavernous sinuses. Dr. Martin limited himself principally to the non-infective cases, and he proceeded to discuss the relationship of the cerebral veins with the brain and the physical effects of cerebral venous thrombosis. These effects were very variable in degree. Haemorrhage was extensive in some instances and completely absent in others, and tissue degeneration was sometimes present, even preceding to complete softening, and in other cases was not found at all. The degree of these changes depended on the size of the vein affected and also largely on the abruptness with which the thrombosis extended and with which the circulation was impaired.

#### Clinical Features

The clinical accompaniments of these pathological changes depended first on their site; if the motor area of the brain was affected abrupt thrombosis often gave rise to severe convulsive phenomena, leaving the patient hemiplegic; or, again, the patient might become hemiplegic without any convulsion or unconsciousness, and with little or no manifestation of shock. Why convulsions occurred in some cases and not in others had not yet been determined. Convulsions seemed to him to be less frequent when there were signs of obstruction of the longitudinal sinus. If the thrombosis was at a distance from the motor area the symptoms often appeared without convulsive phenomena; for example, with lesions in the pre-frontal area convulsions were not common, though some degree of weakness might develop, and when the lesions were posterior to the central gyri convulsions in his experience did not occur.

As for other clinical features, speech was rarely involved, though he had seen one instance of complete right hemiplegia with total aphasia. On two occasions he had seen word-blindness and on two others visual disorientation as part of the symptomatology. The immediate prognosis in a given case was difficult to assess. In the convulsive stage the symptoms were always very alarming, but in his experience fatalities were few. Once the convulsive stage was over, recovery from the hemiplegia might be rapid and more or less complete within a fortnight. In many cases, however, recovery was imperfect, and in fact the most complete and most spastic hemiplegia might be left as a permanent disability. In general, prognosis for recovery of function was much better than in cases of arterial thrombosis, and in a large proportion of cases was good.

#### Cases associated with Childbirth

Dr. Purdon Martin added that he had been particularly interested in the group of cases in which thrombosis in cranial sinuses or cerebral veins occurred in association with childbirth. In most instances, but not all, the manifestations developed during the puerperium and generally between 4 and 21 days after confinement. He had encountered two cases and a probable third in which the symptoms developed during pregnancy, and in each case the patient had a stillborn child, which raised in his mind the possibility that thrombosis might have occurred first in the placenta. Why should thrombosis associated with childbirth occur within the cranium? Here he drew attention to the connecting channels between the pelvic veins at one extremity and the cranial sinuses at the other. In the vertebral canal, and winding in and out between the laminae, was a plexus of veins of considerable size. By injecting these veins with radio-opaque material it had been shown that the passage was free right up from the veins on the floor of the pelvis to the base of the cranium, and was continued into the cranium by a number of smaller veins. If anything did pass up it seemed most likely that it was a small piece of clot, because it was known that such pieces of clot found their way into the iliac veins and so caused pulmonary emboli; pieces of meconium and other elements derived from the amniotic fluid were also said to find their way into the circulation.

Two special factors might be responsible for the occasional direction of material into the vertebral veins—namely, pressure on the inferior vena cava or on the iliac veins, most likely to occur before delivery, and the great enlargement of the pelvic and neighbouring vessels during pregnancy. If any element did pass up, it left, as a rule, no trace of its passage; but one of his patients suffered from a spinal lesion as well as a cerebral one, and in another instance a patient developed complete paraplegia two days after septic abortion, and post mortem there was an abscess involving the tibia at the ninth dorsal vertebra, and no abscess anywhere else in the body.

Air Vice-Marshal C. P. SYMONDS mentioned the frequent occurrence of sudden substernal pain and dyspnoea as a premonitory sign of the thrombosis. He recalled only one case of cerebral thrombophlebitis following dental extraction. There were still several problems left unsolved in connexion with the mechanism of this very curious and not infrequent clinical picture of increased intracranial pressure with increased cerebrospinal fluid pressure and papilloedema. What was wanted was some more direct evidence obtainable by x rays, using the injection of a contrast medium into the superior longitudinal sinus.

Miss DIANA BEST recounted some experimental work which went to show that in the cat and dog the greater part of the superior longitudinal sinus could be obliterated without any inconvenience to the animal. Evidently the collateral circulation was so good that it at once compensated for such disturbance. Dr. DOROTHY RUSSELL described the case of a boy with symptoms of otitic hydrocephalus who was treated in hospital for that condition for some time and improved but died of a concurrent disease (tuberculosis). She was almost sure that the degree of hydrocephalus demonstrated post mortem was less than would have been shown some weeks before death. She suggested that the ventricles changed their size in different phases of the condition.

Dr. RUSSELL BRAIN said that he had collected at Moorfields a small group of cases in which ophthalmoplegia occurred within a few days of dental extraction. In all the cases, he believed, the extraction was in the upper jaw, and the ophthalmoplegia occurred on the same side. He also mentioned a group of cases not so far described in which a cortical thrombophlebitis complicated thrombophlebitis migrans originating in the lower extremities. Mr. D. W. C. NORTHFIELD asked how the diagnosis was made between cortical thrombophlebitis and possible complicating infective abscess.

Dr. PURDON MARTIN replied that if there were no convulsive phenomena at the beginning it might be very difficult to make the differential diagnosis. In the case of abscess the symptoms were likely to extend gradually; in venous thrombosis there was usually spasmodic extension. Air Vice-Marshal SYMONDS said that the right way to look at the question was to regard thrombophlebitis as one of the means by which abscess developed, and when a diagnosis of cerebral thrombophlebitis was made, the possibility of abscess should be suspected.

### ACUTE CATARRHAL OTITIS MEDIA

In the Section of Otolaryngology of the Royal Society of Medicine on Feb. 4 Major GORDON D. HOOPLE, U.S.A.M.C., presented some clinical observations on acute catarrhal otitis media.

Major Hample said that his remarks were limited to otitis media complicated by non-purulent fluid in the middle ear. No term was adequately descriptive of this condition, to which he gave the title "acute secretory otitis media." In 748 patients in the United States seen in his clinic, 619 had infection of the nose or throat just before the onset of the ear symptoms; over 100 showed no evidence whatever of infection either before or during the course of the otitis. There was a marked deviation of the nasal septum on the affected side in 107 cases. He had also seen in a short Army experience 32 cases—12 right-sided, 12 left-sided, and 8 bilateral—almost all of which had followed operations or infections.

Any condition which created swelling in the region of the Eustachian tube could be a causal factor. The fact that the process involved the entire middle ear and not the tympanic cavity alone had not been sufficiently stressed. The history, if typical, would lead one towards the diagnosis. The condition usually followed deafness in one ear or both consequent upon a cold. Examination in the inflammatory stage would show dilatation of blood vessels of the atrium. Bubbles of air in the fluid gave a characteristic appearance. The condition was more difficult to diagnose when the tympanic cavity was completely filled with serum, and the only identifying feature was the over-all amber colour of the drum. Still more difficult to diagnose was the ear filled with fluid, when the drum was so thickened as to show no change in colour, and the loss of hearing was ascribed to the thickened drum.

The 748 patients mentioned had been seen over a period of some years, during which the routine of management had altered, but in latter years treatment had been fairly consistent. Patients were classified in two groups: those in whom the condition was of infective, and those in whom it was of non-infective, origin. To eliminate the infection was the first goal of treatment in patients with acute inflammation, but it might well be that many cases in the first group were classified as due to infection when in fact the infection was not causal but collateral. Nothing was done to these ears until the infection had cleared up. Following this, catheterization with gentle inflation was carried out. If the collection of serum persisted after one or two catheterizations, paracentesis of the membrana tympani was done and the ear was inflated to allow of the escape of some of the fluid. Paracentesis was repeated at intervals of a few days. It was done without anaesthesia, and whilst this caused some discomfort, it was minimal when done in an uninfamed drum.

The nose and nasopharynx of patients in the non-infective group were first swabbed for evidence of infection, and if this was negative other possible causes were looked for—such as allergy and endocrine disorders. In the so-called subacute or protracted cases such additional therapy as seemed indicated was instituted.

In the course of a short discussion Col. NORTON CANFIELD, U.S.A.M.C., suggested that low-grade bacterial infection probably played some part in this condition. Mr. LESLIE POWELL was surprised to hear that allergy was supposed to be an aetiological factor, because his experience was that in spite of the very obstructed nose in hay-fever and other conditions there was no effect on the ear. He believed the catheter was used much too often and for too long periods.

#### Radiotherapy of Malignant Disease of Middle Ear

At the same meeting Prof. B. W. WINDEYER gave a paper on radiotherapy of malignant disease of the middle ear, reporting eight cases of this relatively rare condition which had been treated at the Middlesex Hospital since 1935. Of these eight cases seven were intrinsic growths; it was doubtful whether the eighth was intrinsic or a recurrence of growth elsewhere. Five of the growths were squamous-celled carcinoma; the others were transitional-celled carcinoma, angio-epithelioma of moderate malignancy, and one was undifferentiated. The treatment given was similar to the treatment of malignant growth of the accessory nasal sinuses—namely, a course of radiotherapy carried to a high dose by means of teleradium or x rays, followed, after the reaction had subsided, by radical mastoidectomy to remove any remaining tumour as widely as possible, to provide exposure for subsequent treatment either by radium implantation or localized x-ray treatment, and to furnish a cavity for subsequent inspection. Necrosis of bone or cartilage was obviously the complication most to be feared, and there had been necrosis of cartilage in two of his cases in which the dosage received was heavy. In later cases, however, care was taken to prevent overlapping and to direct beam more accurately, and among these there had been no necrosis, although an equally heavy dose had been given. Some of the cases were very recent, and any conclusion must be drawn with great care, but so far there had been no evidence of new growth among the cases kept under observation.

Mr. C. P. WILSON, who was concerned with the surgical treatment of these cases, said that the results obtained were sufficiently encouraging to make one feel that the lines on which treatment had been pursued were reasonable and offered some chance of giving permanently good results.

O. Mickelsen and A. Keys (*J. biol. Chem.*, 1943, 149, 479) have analysed sweat collected from different parts of the body of normal young men at rest and doing moderate work. It was found that the composition of sweat varied according to the part of the body from which it was collected. Sweat from the hand, for example, is more concentrated in chloride than the total body sweat formed at the same time. Lactate, urea, and ammonia were more concentrated in the sweat than in the blood. Ascorbic acid, thiamine, riboflavin, and nicotinic acid are lost in sweat, but the authors conclude that, even with profuse sweat, losses of the first three are insignificant from the nutritional standpoint. But they observe that "the sweat loss of nicotinic acid under these conditions could be significant. . . ."

## Correspondence

### Infant Mortality in Scotland

SIR,—Under ordinary circumstances the letter by Major S. F. Markham, M.P., on the Scottish infant mortality report (Feb. 5, p. 193) would not call for any reply. But as the report is to be discussed in the House of Commons and the letter has been reproduced in parts in the lay press, the general public and even Members of Parliament, who are not always well informed on medical matters, seeing newspaper quotations from the leading medical journal, may think that these represent the views of a section of the profession.

Mr. Markham's first criticism is that the committee did not consider fully the effects of evacuation and other temporary factors arising in the present emergency. The committee was not appointed for this purpose. It was appointed because for many years before the war the infant mortality rate in Scotland was between 30 and 40% higher than in England. It has remained at that higher level during the war. The Secretary of State for Scotland, who is considering measures for a better post-war Scotland, therefore appointed a purely Scottish committee to consider the more permanent factors causing the relatively high infant mortality rate in Scotland. Medical men will, of course, agree that it would be premature for a committee appointed in 1941 to attempt to evaluate the relative importance of the many temporary factors arising during the war.

The next criticism is that the mortality rate quoted for South Africa applies only to the white population and not to South Africa generally. The reason, of course, is that there are no exact data on the infant mortality rate of natives in Africa still living under native conditions, and even if such data were available they would not throw any light upon the high infant mortality rate in Scotland.

Then the committee is blamed for not obtaining statistics on the percentage of the insured population unemployed in English cities. Mr. Markham's impression is that such information is available in the Ministry of Labour statistics. The committee tried to get this information, but was informed by the Ministry that it was not available. He states that the bibliography shows gaps and that the research of three workers he names is not referred to. The report is pretty fully documented, but, as every medical man knows, there are thousands of papers on the subject, and a complete bibliography quoting every one of them would not have added to the value of a report to a Minister of State who is not interested so much in fundamental research as in the practical measures that should be taken to apply well-established knowledge.

The main burden of Mr. Markham's criticism, however, is that sufficient attention was not paid to the effect of climate on health. He himself has written a book on *Climate and National Energy*. He gives some figures showing that at the moment of birth an infant passes from 99° F. to 50° F. or even 40° F., and states that extensive research carried out at a hospital in the United States showed that at temperatures of 77° F. the mortality of premature infants was reduced from 29 to 0.7%. If it is a fact that the mortality of all premature infants could be reduced from 29 to 0.7% by simply keeping them warm and regulating the humidity, then the medical profession should be regarded as hopelessly incompetent. As a matter of fact the figures quoted only apply to a small selected group of infants, and, as every medical man knows, only a small proportion of premature infants can be saved by the methods referred to. These methods are being carried out as efficiently in Scotland as in America.

Mr. Markham states that the average Scottish household of 3 to 5 persons spends 13% less on coal, gas, or electricity than in England. The obvious explanation is that, in proportion to the population, there were before the war six times as many people in Scotland living in unhygienic and overcrowded houses as in England. The number of rooms occupied by the average Scottish household of 3 to 5 persons is, therefore, fewer than in England. The overcrowding is an obvious cause of high infant mortality, but the fact that people in small houses use less coal and light than people in larger houses has no bearing on the question.

Mr. Markham pursues this subject of climate at some length. The committee considered the effect of climate and pointed out that mortality is much higher in winter than in summer, but came to the conclusion that the effect of climate is more than offset by other influences. Mr. Markham considers this "an incredible statement" in view of the fact that Scotland is, on the average, 5° colder than Southern England. If climate were the main factor one would expect the Shetland Islands, the most northerly part of Scotland to have a higher infant mortality rate than towns on the Firth of Clyde. In the pre-war quinquennium the rate in Shetland was 39 and in Clydebank 83. Iceland should have a high rate and Portugal a low rate. The rate in Iceland was 48 and in Portugal 147. In the



quinquennium 1896-1900 the rate in Scotland was 20% lower than in England and 16% lower than in Holland. In the period 1934-8 the rate in Scotland was 35% higher than in England and almost 100% higher than in Holland. There is no evidence of any drastic change in climate which would cause these changes in the relative infant mortality rates.

The last point made by Mr. Markham is one in which he refers to "Wooltonized diets." In this connection he says that, although the diets have been "Wooltonized" and there is little unemployment or poverty in Scotland, the infant mortality rates are still excessively high, while the English figures are now the "lowest on record, in spite of housing difficulties of an unprecedented degree." This argument is not very clear unless, indeed, it is that bad housing and poverty are not important factors in a high infant mortality rate, and that improvement of the diet by the Government food policy, which makes special provision for mothers and infants, has had a marked effect in England but none in Scotland. As a matter of fact, the changes in infant mortality in Scotland during the war run roughly parallel with those in England. In both cases the rates rose in the beginning of the war, and in the last two years have fallen by about the same proportion. The provisional rate in Scotland for 1943 is 65 per 1,000 compared with 77 in the pre-war quinquennium.

Such are the reasons given for the statement that the committee "skipped its job" and "regarding environmental conditions generally," made "not a helpful suggestion in the report." The main recommendations in the report made to the Secretary of State for Scotland are briefly as follows:

- (1) Every effort should be made to improve housing without waiting for formal town planning.
- (2) The means taken by the Government to improve the diet of mothers and infants should be extended as more food becomes available.
- (3) Child welfare services should be extended and improved.
- (4) Ante-natal clinics should be an essential part of the obstetric service and staffed by obstetricians.
- (5) The number of beds available in maternity hospitals should be increased; the nurseries should be improved with special cubicles for premature infants.
- (6) Medical and general education should be improved.

The committee was unanimous in making these recommendations, and there is little doubt that medical men, however their views may differ with regard to the relative importance of the factors causing the high infant death rate in Scotland, would agree that these measures would reduce the rate and that they are the kind of measures which any committee of experts would have submitted for the consideration of the Secretary of State. Unfortunately there are too few members of the medical profession in the House of Commons. The debate is liable to be confused by speeches by politicians who are not well informed on the subject. It is to be hoped that all the medical members will give full support to the measures proposed, and thus assist their colleagues in Scotland to eliminate the main causes of the high infant mortality rate. The medical profession can do little more than it has done under the specially adverse conditions in Scotland. The remedy lies in Government action on a national scale.—I am, etc.,

DUGALD BAIRD,

The University, Aberdeen.

Chairman of Drafting Subcommittee.

SIR,—There is one factor in common to all those countries which have reduced their infant mortality to an enviable low level—namely, the first and most marked reduction has always been due to a fall in the death rate from preventable gastro-intestinal and respiratory infections. In Scotland infant mortality from these causes is still excessively high, and has shown no reduction for a quarter of a century. It would seem, therefore, that the first attempt to reduce Scottish infant mortality should be a direct attack on these two groups of infections, both of which are closely correlated with poverty.

The infant death rate from respiratory diseases in Scotland is higher than in some other countries with an equally bad climate. Low fuel consumption may be a factor, as Major Markham, M.P., in his letter suggested, but only an indirect one, in that it limits the household to one fire no matter how large the family. Instead of suffering from exposure to a low temperature, the infant is subjected to an intense barrage of droplet infection in an overheated, overcrowded room at a time of year when respiratory diseases are most prevalent.

Major Markham states that from 1940 to 1943 there was singularly little unemployment or poverty in Scotland, but the infant death rates remained high. This is not surprising, as the

temporary abolition of poverty was largely theoretical. Mere increase of money, with its reduced purchasing power, both in quality and quantity, has not enabled the poor to improve or relinquish their environment in these years of war. The whole problem of reducing infant deaths from respiratory infections is that of the factual abolition of the environment of poverty and of the habits engendered therein. It not only involves rehousing but also a simultaneous raising of the standard of living. A family, rehoused from a slum, will continue to live in a slum environment as long as economic necessity forces it to economize in fuel or to sublet rooms.

The high infant death rate from gastro-intestinal diseases in Scotland is associated with the combination of poverty and incorrect artificial feeding. A whole generation of health visitors has failed to reduce these deaths. In several years' experience of maternity and child welfare I have noticed that, below a certain economic level, a mother does not benefit from good advice. She has not the necessary apparatus for the correct preparation of artificial feeds, but she does not lack the actual ingredients for correct feeding, as these are provided by the Government, free if need be, for every infant in the country. I wish to make a suggestion which has not, so far as I know, been tried in this country. I suggest that the Government should set up depots for infant feeding in all areas where there is a high infant death rate from gastro-intestinal diseases, and that these depots should provide daily to all artificially fed infants in these areas a 24-hour supply of feeds, correctly prepared for the child's age and individual requirements, sterilized, and bottled into separate feeds, ready for use (except for rewarming). I know of no other rapid way to ensure the infant a reasonable chance of a correct, almost germ-proof and almost fool-proof, food supply. There is little chance of abuse, for these feeds could not be a saleable commodity, as were tins of dried and liquid milk obtained free at clinics. I saw this plan in operation when visiting infant welfare clinics in Moscow in 1934. Each mother brought her crate of "empties" to be exchanged for a full one. The scheme could be worked either through an extension of existing infant welfare clinics or by a paediatric team attached to a hospital. It should be accompanied by an intensive and unremitting campaign for breast-feeding. Incidentally, by rendering it difficult for a mother to discontinue breast-feeding prematurely on her own initiative, it would lessen the number of bottle-fed babies.

The plan would require organization and expenditure. This was also true of diphtheria immunization and of A.R.P. It could be a temporary measure during this stage of social transition, pending rehousing and other means of raising the standard of living. It might effect an immediate improvement in the infant death rates from gastro-intestinal diseases, which at present account for roughly one-tenth of Scottish infant mortality.—I am, etc.,

Colhai, Aberdeen.

MARGARET S. M. MCGREGOR.

### "Immersion Foot" and Cold Therapy

SIR,—In their article on the aetiology of "immersion foot" (Feb. 12, p. 218) it appeared to me that Goldstone and Corbett implied that frost-bite and trench foot were probably synonymous terms. This, however, is far from the truth. As long ago as 1915, while investigating trench foot in the last war, I showed that there was an essential difference between this and true frost-bite. There is a critical temperature in the region of  $-5^{\circ}$  C. above which individual tissues will survive for prolonged periods, while below this temperature immediate death occurs owing to protoplasmic disruption. This critical temperature is beautifully demonstrated when tissues growing *in vitro* are the subject of experiment. That the temperature is so far below zero is due to the exhibition of the phenomenon of supercooling in protoplasmic tissues.

It has, of course, never been suggested that immersion foot bore any relationship to true frost-bite, but that it closely resembles trench foot, both in the circumstances of its origin and its clinical course, cannot be denied. The gangrene, when it occurs in these cases, is a secondary event due to vascular changes, and in the experimental animal can actually be prevented by tying the main artery to the limb, so limiting the exudate, or alternatively by the use of local vasoconstrictors

(not vasodilators as the authors of this article suggest). Indeed one of the most certain ways of precipitating gangrene in the chilled limb is to bring about vasodilatation by heat or other means. A summary of the experimental work which led to these conclusions nearly thirty years ago will be found in chapter 23 of the third edition of *The Foot* (Lake) or in *The Surgery of Modern Warfare* (Bailey).

Incidentally the article on dry cold therapy by Bigelow and Lanyon in the same issue (p. 215) raises some points of a similar nature. At long last the virtue of keeping parts temporarily deprived of their blood supply (whether this be due to blocking of the larger arteries or local ischaemia due to the pressure of exudates) in cold storage is becoming recognized, and the specific indications for refrigeration are being worked out.

To quote from the chapter on frost-bite in *The Foot*: "The main indication for the therapeutic use of the method (refrigeration) is in those cases where a collateral circulation may be confidently expected to develop within a reasonable time if the limb in the meanwhile can be prevented from undergoing gangrene. The results are less notable in the more chronic cases—i.e., thrombo-angiitis, etc.—but even in the senile cases the relief of pain will often enable one to postpone the inevitable amputation to the most propitious moment."

"We may sum up the position, therefore, by stating that a cold (i.e., in the region of 0° C.) limb requires no blood supply, since all its tissues are in a state of suspended animation, and as a corollary, a limb depleted of its blood supply should be kept cold, otherwise its tissues cannot retain their vitality."—I am, etc.,

NORMAN C. LAKE.

### Recognition of Anaesthetic Gases

SIR.—The Council of the Medical Defence Union is at present actively engaged with the Association of Anaesthetists in a review of certain difficulties experienced by anaesthetists with respect to the recognition of the actual gas or gases delivered to and from anaesthetic apparatus. It is hoped in the near future that it will prove practicable to submit to your readers a full report on the measures proposed by the above bodies for adoption by those concerned to obviate errors of wrongful coupling or of misidentification of the gas or gases in use.

For the present all anaesthetists of whatever experience and qualification are urged to satisfy themselves personally of the actual gas about to be administered to a patient and not to rely upon the assurances of other parties. The factor of personal responsibility should never be absent from the mind of an anaesthetist, with the result that before commencing the administration of any gas or mixture of gases he should check his apparatus and cylinders completely to satisfy himself beyond reasonable doubt on the character of the gaseous anaesthetic he proposes to administer to a patient.—I am, etc.,

ROBERT FORBES,

Bedford Square London, W.C.1 Secretary, Medical Defence Union.

### Intravenous Anaesthesia

SIR.—Mr. J. F. O'Connor (Feb. 5, p. 199) has raised several points in connexion with our article on intravenous anaesthesia (Dec. 25, p. 813) which we would like to answer.

1. *Use of Table.*—In practice we stand our saline container on the table of the Boyle's apparatus (the very stable hospital pattern) from which we administer the supplementary nitrous oxide and oxygen. If the site of operation necessitates the use of a leg vein for the intravenous drip, a separate table will not be in the surgeon's way. The anaesthetist as well as the surgeon must have the right of access to some part of the patient.

2. *Use of Hand Bulb.*—We agree that this requires more frequent attention than the method of choice—i.e., using the oxygen cylinder to provide positive pressure—nevertheless, if the hand bulb is used, a screw clip or pair of ovum forceps applied to the tube when the pressure has been raised in the bottle will prevent any leak, and the hand bulb need only be used at long intervals when the drip is seen to slow up. So long as any pressure remains in the bottle, saline must flow into the vein, and there is no question of blood running back into the needle and clotting. A gravity drip-stand must be tall to provide the necessary pressure and will be, therefore, either top-heavy or have a wide base to get in the surgeon's way.

3. *Fixing Needle.*—The three pieces of strapping as described in our article have always proved adequate. The extra strapping suggested by Mr. O'Connor would give greater security.

4. *Pressure Tubing.*—We agree, any good rubber tubing will suffice. Under wartime conditions this is in short supply, and we mentioned pressure tubing to prevent the leakage of saline from the puncture sites.

5. *Premedication.*—We normally use as a maximum omopon 1/3 gr. and seopolamine 1/150 gr. given 1½ to 1½ hours before operation; this time allows its maximum hypnotic effect to be attained and its most marked respiratory depression to have passed. We believe that the large doses of morphine up to 1/2 gr. as suggested by Mr. O'Connor have too marked an effect on respiration especially when the anaesthetic drug to be employed is itself depressant.

6. *Vomiting.*—The use of analeptics to hasten recovery is known to increase the incidence of post-operative vomiting. We agree with Mr. O'Connor that this sequel is often attributable to the morphine and would be a further reason for limiting the pre-operative dose of this drug and restricting its indiscriminate use post-operatively. We have noticed that in many cases there is a long period between return to consciousness and the onset of vomiting, and this can often only be explained as a result of post-operative opiates.

7. *Dosage.*—We would like to state categorically that there is no such thing as a maximum and minimum "dose" of pentothal, any more than there is a "dose" of chloroform or ether. The amount given must be regulated by the susceptibility or resistance of the individual patient, the length and depth of anaesthesia required by the surgeon, and this can only be determined as the operation proceeds. Excessive quantities of pentothal or any other anaesthetic will delay recovery, and to our minds this prolongation of respiratory and circulatory depression is a potent factor in the aetiology of post-operative complications. As was stressed in our paper, it is considered most important that for any but the shortest operations intravenous anaesthesia should be supplemented by nitrous oxide and oxygen. For operations not requiring much relaxation—e.g., skin grafting, suture of multiple lacerations, simple herniotomy, etc.—an induction dose of 1/4 to 1/2 g. of pentothal supplemented with nitrous oxide and oxygen will maintain anaesthesia for 1/2 to 3/4 of an hour. For longer operations or those requiring greater relaxation the same method is used, but smaller repeat doses of pentothal, 0.05 to 0.15 g., are given as required. Even for the longest operation requiring the deepest anaesthesia we have rarely if ever had to use more than 2 g.—i.e., 40 c.cm. of 5% pentothal. We consider it wiser to obtain such profound and prolonged relaxation by a combination of a regional nerve block or spinal analgesia and a light general anaesthetic (such as nitrous oxide and oxygen following a pentothal induction). For the majority of such cases as hysterectomy, prostatectomy, and appendicectomy, etc., 1 g. (20 c.cm.) of pentothal plus nitrous oxide and oxygen has been found to be quite sufficient.

In conclusion we should like to thank Mr. O'Connor for the interesting points he has raised in his letter and to sympathize with him in his double responsibility of operating while supervising the anaesthetic. We feel that this difficulty is closely allied to the whole problem of undergraduate and postgraduate teaching of anaesthetics, the solution of which is not assisted by the unavoidable production during wartime of many semi-specialist anaesthetists.—We are, etc.,

F. W. ROBERTS.  
B. A. SELICK.

Middlesex Hospital, W.1.

### Treatment of Chronic Nephritis by Serum Transfusion

SIR.—I find Dr. J. H. Hannan's letter on this subject (Feb. 12, p. 232) confusing. He states that serum transfusion in shock and haemorrhage has been well established; inferentially its use should follow in the treatment of "chronic nephritis or nephrosis." "Nephrosis" is the term he prefers to use in cases of chronic nephritis with presumably oedema. Where is the connexion?

In shock and haemorrhage serum may be used to increase the circulating blood volume; in the nephrotic syndrome there is no significant reduction in the C.B.V. Protein solutions are used here to maintain the blood reservoir, and, especially when given in "hypertonic" concentrations, to promote oedema resorption and diuresis; moreover, serum may be dangerous in the treatment of haemorrhage by acting as a blood diluent.

I deplore the use of the term "nephrosis" for cases of chronic nephritis with proteinuria and oedema, and do not agree that in these cases we restrict the protein intake, nor do I see why "protein obtained from and at the expense of the body cells" increases oedema. The "nephrotic syndrome"

occurring in nephritis mimics "nephrosis" is not entity and a rare disease, whose study has thrown little light on the mechanisms of renal oedema. In this condition there is massive proteinuria, widespread oedema, and severe hypoproteinaemia, and good renal function without azotaemia. It is precisely in these cases that a liberal policy is followed in an attempt to maintain tissue and blood protein levels to compensate for the urinary loss. Azotaemia, if it is to be regarded as contraindicating a liberal policy, is not found often, and when present is usually due to severe oliguria with pre-renal deviation of water balance, which is corrected by diuresis. A high protein intake, or even such a diuresis, particularly in the nephrotic syndrome, has been maintained previously on an entirely sound rationale. Furthermore salt and water balance and the administration of urea should secure a sufficient intake to correct these minimal azotaemias.

One of the most important factors in the pathogenesis of hypoproteinaemia. In a nephrotic patient the loss of blood protein at the expense of the tissue protein, with the tendency to oedema, but there will be a tendency to the degree of tissue destruction. In dehydrated patients with uraemia such a process occurs, the oedema is not, but polyuria and dehydration are present and there is an accumulation of those toxic products of abnormal protein catabolism which accompanies and perhaps causes the toxic state that we call "uraemia."—I am, etc.,

St. James Hospital, S.W.12

P. HARRIS

### Preventing Necrosis of the Tabula Externa in Head Wounds

SIR,—In your issue of Feb. 5 (p. 185) Dr. D. Engel calls attention to a very useful method designed to prevent necrosis of the tabula externa of the skull denuded of periosteum. The plan is certainly not new, but I regret that I cannot state from whom I first learned it as long ago as 1905. Since that time I have used it on several occasions and have found it to be most helpful. I am sure it will assist the separation of bone which is beyond hope of survival, but even when the surface is white, dry, and apparently devoid of life granulations soon spring up through the holes made into the diploe and spread over a considerable surface in a most remarkable way. I have used the method when quite large areas of cranium have been exposed, and it is interesting to observe how the advancing scalp edges will grow over the granulations, which soon cover the affected area, but, of course, without the hair.

I am personally much indebted to Dr. Engel for the very useful diagram which accompanies his short note.—I am, etc.,

G. GREY TURNER,

Professor of Surgery,

British Postgraduate Medical School

-London, W.6.

### Sciatica

SIR,—The fog about this subject of which Sir Arthur Hurst writes in his letter (Feb. 5, p. 194) will not, I am afraid, be dispelled by his words either in that letter or in his original "essay in debunking." It would be a pity if this correspondence ended without the subject being made as clear as possible in the present state of our knowledge. In his evident anxiety to disparage the orthopaedic surgeons and to knock their heads together, Sir Arthur has, as Mr. Harry Platt said, done scant justice to those who, both in Britain and the U.S.A. during the last twenty-odd years, have made great and successful efforts to solve the problems of spinal pathology, and so to elucidate the symptoms, such as sciatic pain, which can arise from its various forms.

Sir Arthur has misinterpreted the remarks made by myself and others in a number of instances, but it is a relief to find that he does allow that "almost all cases of sciatic pain have a physical basis at the onset," though unfortunately he goes on to say that this "generally disappears rapidly" with the panacea of rest and persuasion. One would have expected that a great pioneer in this country of thorough investigation of disease would have advised determination and treatment of the physical basis of sciatic pain as the first step. Explanation, persuasion, and re-education are certainly most important, and are appreciated by orthopaedic surgeons as much as by anyone; but their use without determination and treatment of

the physical state would not be "simple psychotherapy" but simple humbug. The difference between Sir Arthur Hurst's attitude and that of orthopaedic surgeons is that he apparently thinks that the physical state may be disregarded while they consider it primarily important.

It would perhaps help understanding of the incidence of the different causes of sciatic pain if we divided cases into those over and under the age of roughly 40. Under 40 is the period during which posterior disk rupture may occur, and its incidence among cases of sciatic pain during this period may well be as high as the figure of 20% which Sir Arthur mentions. Indeed Jackson (*Journal*, Dec. 18, 1943, p. 776) states that 18 out of 100 cases treated at an E.M.S. hospital during 1942, mostly from the Services and therefore presumably between the ages of 20 and 40, were proved by operation to have posterior disk rupture. But the figure of 2% which I gave is the probable incidence for all cases of sciatic pain if all ages are considered, and corresponds with the percentage given in the large series of the Mayo Clinic. Thus it seems that confusion on this point is due to failure to distinguish between young adult and older cases. Again, in middle-aged and elderly patients there is no doubt that the spinal arthritis of which Mr. Blundell Bankart writes is by far the most common cause of sciatic pain, and since such pain is more often experienced in middle and later life, spinal arthritis in its various forms is, as Mr. Bankart says, in general the commonest cause of sciatic pain.

The points I have tried to make in this discussion are that: (1) in almost all cases of sciatic pain there is a determinable physical basis; (2) both pure hysteria and malingering are rare (though there is often an associated psychological factor); (3) the physical basis is either (a) a state of the fibrous tissue of the ligaments or fasciae in the lumbo-sacral or gluteal regions due to fibrositis, trauma, degeneration, or strain associated with postural disorder, malformation, arthritis, or other deforming disease, or (b) a source of irritation of the roots of the lumbo-sacral plexus; (4) in most cases the pain in the limb is purely referred: only in perineuritis or in pressure on the nerve roots as by a posterior disk rupture are there accompanying neurological signs; (5) disk rupture is an important though relatively uncommon cause of pain if all cases at all ages are considered; it occurs practically only in adults between the ages of roughly 20 and 40; (6) there is a danger of unnecessary operation if cases of persistent sciatic pain are thought to be only neurosurgical; (7) every case should be thoroughly examined to determine the physical as well as the psychological state before treatment, as only in that way can treatment be rational.—I am, etc.,

Bournemouth.

N. ROSS SMITH.

SIR,—Much ink has been spilt about sciatic pain and disk protrusion in recent issues of the *Journal*, and I have hesitated long before adding my own quota. However, Dr. Coldrey's letter (Feb. 12, p. 231) has prompted me to write, and I hope that my contribution to this correspondence may be of value in view of the personal experience involved.

I have suffered from pain referred along the distribution of the sciatic nerve, combined with an unenviable collection of extremely tender nodules in the lumbar region. I know from bitter experience what this pain is like and how it completely limits one's activity. I know, too, the disappointment felt when local measures, including rest, heat, massage, exercise, local novocain infiltration, and epidural injections failed to influence the condition. I have observed these things in myself, and also the ultimate result of correct treatment, and, being a doctor, perhaps my observations may not be without interest.

Fortunately (perhaps Dr. Coldrey would disagree with my adverb) I was seen by a neurosurgeon, who, after full investigation, diagnosed a herniated nucleus pulposus and subsequently removed it. Now, from the first conscious moment after recovery from the anaesthetic, the dreadful referred pain had gone. To be sure there was pain at the wound site for a few days, but the characteristic pain that I had suffered for months had gone, and has never recurred. Of that I am quite sure. There may be some who would say that any form of treatment would have the same result—a psychological one—but I had other forms of treatment, and I did not light-heartedly demand

operation out of impatience or for any other reason. The interesting feature is that the nodules in the lumbar region, though fewer and smaller, are still present, but there is no local or referred pain on handling them even roughly. This is 3½ months since operation.

I believe that these results are secondarily produced in the lumbar muscles and fascia along the distribution of the posterior primary rami of the lumbar nerves by reason of the irritation of the protruded disk at the level involved. I refer, of course, to irritation of the nerves within the vertebral canal. Furthermore, my experience suggests to me that such nodules are only painful so long as some irritative process is affecting the nerve roots. Many types of irritation, of which disk protrusion is only one, may act in this way in so-called fibrositis cases. I am now back to full duty with no disability at all and no trace of my former pain. I am able to execute movements that were quite impossible before operation.

Let someone who has had sciatic pain (I shrink from using the word "sciatica") decide whether it is impatience that compels the sufferer to seek more thorough investigation and more radical treatment than some of your contributors would offer. As for the suggestion that a functional element is present I heartily agree that this is so, but I suggest that anyone who has been incapacitated by this terrible pain and knows the agony of sneezing, knows, too, how it feels to be awakened at night by the pain caused by involuntarily turning in bed, will develop an anxiety state about his condition, especially after the failure of local measures. Let me assure anyone interested in this condition of disk protrusion that the pain is really dreadful and its continuance is demoralizing.

In my convalescence I was lucky enough to see operations performed for the same condition, and I can assure anyone that the protrusion is very real, and that the affected nerve is stretched and swollen over the protrusion. I am awaiting with interest an authoritative survey of such cases by the neuro-surgical team concerned, and the fact that such a publication is still delayed should chasten all of us who leap into print and controversy about this matter of disk protrusion without knowledge of all the facts and experience of many proven cases. For my own part, I know of the benefit of operation in my own case and in the case of at least one other doctor with whom I shared a room in hospital. I have not made any mention of the investigations undertaken in my own case or of the post-operative treatment, as I believe that these matters rightly belong to the detailed survey of cases which I hope to read soon—I am, etc.,

Aberdeen

MALCOLM R. MILNE.

SIR, -Much of the confusion which surrounds discussions on sciatica arises from the inaccurate use of terms. Sciatica is not a disease, and it is not a symptom; it is a syndrome. In other words, the term "sciatica" denotes a group of symptoms and physical signs which indicate an affection of the roots or trunk of the sciatic nerve, from whatever cause arising. Thus, pressure by a malignant growth, diabetes, trauma, exposure, retropulsion of the nucleus pulposus, and perineuritis may all cause sciatica, for they may all affect the roots or trunk of the sciatic nerve. The term "primary sciatica" might well be employed for the benign condition of which the assumed pathology is a perineuritis or interstitial neuritis, and "secondary sciatica" for all other affections of the trunk of the nerve or its roots. Unfortunately the term "sciatica" is often used as a kind of topographical designation to indicate pain of any sort between the crest of the ilium and the ankle. Thus under the head of "sciatica" Prof. Platt and Dr. Cyriax include long catalogues of morbid conditions which bear only the most remote resemblance to true sciatica and which may be distinguished from it by a simple clinical examination. When the presence of the sciatic syndrome has been established, the task then arises of determining its nature, and here the differential diagnosis may be difficult. This, however, is a subject outside the scope of a letter, but it may here be said that retropulsion of the nucleus pulposus is more frequent than is usually supposed, and that the majority of such cases ultimately recover without operation, which should be reserved for the more protracted and severe examples.

I entirely agree with Sir Arthur Hurst that sciatic symptoms are often prolonged by the injudicious continuation of treat-

ment (post-sciatic hysteria). At an appropriate stage all treatment should be stopped, the search for nodules should be rigorously forbidden, the patient should be assured that the twinges and paraesthesia will pass away in time, and he should be encouraged to return to his affairs.—I am, etc.,

Edgar Allen Institute, Sheffield.

R. G. ABERCOMBIE.

\*\* This correspondence is now closed.—ED., B.M.J.

### Umbilical Hernia in Children

SIR,—May I crave a few lines of your space to correct a statement on this subject by Mr. D. B. E. Foster (Feb. 12, p. 230). The point I take exception to is this: "It is generally agreed that when the sac contains all or a large part of the liver operation is useless, as it will be found impossible for the coelom to contain all the viscera."

I have twice operated for this condition when the liver and all the mobile viscera were in the sac, and on each occasion was able to close the abdominal cavity. One patient survived and is now just over 3 years old. She compares very favourably with her identical twin. I recorded my case in the *British Journal of Surgery*, and Prof. Lambert Rogers kindly sent me notes of a case of his of complete exomphalos. If I remember rightly he recorded his case in the *British Journal of Surgery* when the child (female) was 6 years old. She looked very fit but had a double inguinal hernia.—I am, etc.,

Great Yarmouth.

LEONARD LEY.

### Functions of Industrial Medical Service

SIR,—The article on the supervision of pregnant women in factory employment (Jan. 22, p. 108) aroused my interest and, in addition, my admiration for the manner in which the authors, Mr. J. V. O'Sullivan and Dr. L. B. Bourne, so deliberately ignored all difficulties in establishing their factory ante-natal clinic. As an industrial medical officer I was at first tempted heartily to agree with their conclusion that such a clinic is advisable nowadays, although not entirely because it saved the women "time, money, and many working hours," for even in this age of economic factors above all others we, as a profession, will surely concur that the welfare of the individual is not necessarily enhanced by these material considerations. One factor that has already influenced it, and will do so even more in the future, is the relationship between members of our profession, and from my own point of view I am thinking particularly of the co-operation which must exist between the industrial medical officer and the general practitioner, whose patients should be our constant interest and concern during their hours of work. It is furthermore generally agreed that in this country at any rate their welfare in industry will vary with the extent of our treatment services, and that the latter will best serve their purpose in an industrial medical service when they are reduced to a minimum. It is not the function of an industrial medical service to duplicate the work of either the general practitioner or other medical services.

I am therefore perplexed and worried to find so little reference in this admirable paper to the methods which the authors adopted to ensure co-operation with the general practitioners of those women who were seen and treated. We are told that at the first interview "the patient's local practitioner is informed that this patient has sought advice, and she is then booked to see the consultant at his next visit." In addition, apparently, when she so desires it she is sent to whatever hospital she chooses with a covering letter, and this is all done without waiting for the consent of the patient's doctor, or seeking his advice, particularly as to whether his patient should be confined in hospital or at home. After that it is not so surprising to read that "later, the scheme was enlarged to include the treatment of gynaecological cases." But surely this is contrary to every concept of an industrial medical service, and in frank opposition to the suggestions in the ethical rules drawn up by the B.M.A. for these services.

It may be that I have misinterpreted this paper, but it seems very probable that similar impressions to mine have been created in the minds of others who read it, and it is therefore only right that they should be corrected. A factory ante-natal clinic is to my mind such an ideal addition to any industrial medical service, provided it works in close co-opera-

tion with (or as part of) such clinics already provided by the public health department, that enlightenment of the problem by Dr. Bourne would be very much appreciated. The treatment of gynaecological cases, however, is a different matter altogether and is certainly not one of the accepted practice of an industrial medical service as I know them.

D. KENWIN FRANKS

D.S. Medical Officer Imp.

### Bone-marrow Infusions

SIR,—I have read with great interest Mr. E. H. Bailey's review article on bone-marrow infusions. The following points about infusions in infants may be of interest, as the technique is found the most useful in these cases differs somewhat from the one described by Mr. Bailey for adults.

The cannula used was 1 in. long and of 17 gauge wire gauge. The point was bevelled like that of a fine-puncture needle, and I found it easier to get down the bone was penetrated with this cannula than with a cannula sent was used. The handle was fixed to the needle, and was removed with it after the introduction of the cannula so that the weight of the handle need not be supported by the bone. I did not find the use of a metal guard or of "wings" possible, as their sustained pressure is more than the skin of these dehydrated, marasmic infants can stand. In one case where I used a guard the skin became necrotic underneath it after two days. In all later cases I found a "naked" needle quite satisfactory and firmly fixed.

After two or three days the cannula will become loose and has to be removed. It is rarely necessary to persist any longer with the infusion. If the needle is left longer some of the fluid will ooze out of the marrow cavity into the subcutaneous tissue, and in one case where this happened the patient developed osteomyelitis. It was the only case in over forty infusions, and I believe it could have been prevented if the cannula had been removed earlier. It cleared up after surgical treatment. Considering the high susceptibility to infections of these infants, all of whom were almost moribund on admission, one must admit that the danger of producing osteomyelitis is small.

To fix the leg for the infusion we used a foot-and-leg splint reaching half-way up the thigh. It was made of 1-in. Cramer wire. A short cross-piece was fixed under the heel of the splint to prevent rotation of the leg, and a sausage-shaped bag filled with shot was bandaged between splint and padding. This made the splint so heavy that the infant could not move it. The cannula was introduced on the medial side of the tibia just below the level of the tuberosity, and no further fixation was necessary except the application of a sterile dressing around it. The advantages over intravenous infusions are the considerable saving of time and the ease with which the infant can be moved afterwards without fear of displacing the cannula.—I am, etc.,

G. BEHR.

London, N.W.2.

### Shock Therapy

SIR,—Dr. Winnicott asks for the opinion of general practitioners. Few of us will feel competent to discuss the value of shock treatment, because we have not watched enough cases over a sufficient period of time to have reached conclusions. It is quite clear that marvellous immediate results are being obtained in many cases. These make it clear, I think, that the treatment is justified in all cases judged to be "incurable" by less drastic means. Provided I feel I can trust the clinical judgment of the psychiatrist concerned, I advise my patients to undergo the treatment without hesitation.

I realize, however, that nearly every "new treatment" that has appeared during the last 30 years has been shown ultimately to carry a poisonous barb in its tail! I anticipate that within 10 years the same will prove true of shock therapy. I expect that it will be found that just as epileptic fits (and the bromide-phenobarbitone treatment) cause a degree of deterioration in the personality, so also will shock therapy. In a disintegrated personality this deterioration may be of no moment, but if the treatment were extensively used for cases that could be cured by less drastic means needless harm would have been done. Particularly, I foresee a danger that shock treatment

should come to be used as a "short cut" to the abolition of mental symptoms. Surgery can be used in a similar fashion. If shock treatment were ever employed or advocated, either because there were not enough trained psychiatrists to devote personal and individual care to individual cases or because the facilities for cultural, occupational, and recreational therapy were inadequate in the hospital, then shock therapy would be an unethical form of treatment.

From my own experience I endorse Dr. Winnicott's statement that the vast majority of children who manifest the schizophrenic, depressive, paranoic, and hypomanic types of personality recover spontaneously under right management. If that were not the case our mental hospitals would be still more crowded than they are. I hope most sincerely that the utmost caution will be exercised in the use of shock therapy (or any other form of drastic treatment) for children. I believe that child psychologists and psychiatrists ought to co-operate with educationists and those concerned with delinquents to investigate the "norms" of child-personality and its commoner deviations. When the "norms" have been determined it would be possible to judge whether a form of treatment that may damage mental function and even nervous structure can be justified in any particular instance.—I am, etc.,

Worcester

HOWARD E. COLLIER.

### Shock Therapy: A Personal Experience

SIR,—I have read the letters on electric convulsive therapy by Dr. Winnicott and others with interest and amazement at some of the opinions of the effect on patients. Some first-hand experience as a patient may clear misgivings.

As a student and doctor I felt some awe at the stories I heard about shock therapy and was glad I was not the patient. Since then I have suffered a severe reactive melancholia, a doctor was called, and I was persuaded to undergo treatment at a progressive mental hospital with a tradition of humane treatment of the mentally ill. In spite of continuous narcosis and then psychotherapy I became worse, and after six weeks I gave notice of leaving. It was then decided to try convulsive therapy, which was used extensively at the hospital, and my wife (the only person whose honesty I trusted) persuaded me to stay for it. Being melancholic I was very fatalistic and was always waiting for the worst. I walked to the room, feeling, I suppose, like a murderer going bravely to the gallows and interested in the mechanics of the apparatus. I do not think it was a wish for death, as I never wanted to die, but had only thought of life for myself as being impossible. When a soldier feels there is no alternative but to charge the enemy guns, and that his life or death is out of his hands, that is surely not a wish for death.

The psychotherapist was experienced and business-like about the treatment. I lay on the bed, pushed my feet against the pillow, had the electrodes clamped round my head, bit the pad between my teeth, and relaxed. I remember feeling, even then, it was an experience that might be useful to have. Also, what seems very important, I felt that something really was being done, and that I was a real patient and not only a contemptible fraud who had no right to be off work. When the current was switched on I felt nothing; it was just like going to sleep without sleepiness. Later I woke up back in my bed, collected my diseased wits, and in a few minutes realized I had had the shock therapy. Although my logic and reasoning were the same and seemed never impaired, my melancholic perspective of myself had changed—rather like a child wakes in the sunlight after a midnight thunderstorm with the same parents and home round him. I remembered quite quickly everything leading up to the so-called shock. Nurses and family noticed a miraculous improvement.

The following "shocks" were at greater intervals. Although I knew exactly when to expect the loss of consciousness, I could never detect it happening. As the intervals between each dose drew to an end I was able to detect a change of mood for the worse, which would be magically dispelled by the next "shock." It was too subtle a retrogression to describe and I never tried to tell others of it. I saw other patients brought back from the treatment, some unconscious and some in chairs. They looked pitiable sights, but if they were like me they knew nothing of it themselves. The only mild discomfort



was that of vomiting once after the first of the nine doses.

I was at the hospital three months and convalescent three months after. When I left the hospital I was still ill (I never then believed they would really let me out without one or other of the staff punishing me with some torture, if only on the last night). My memory of the hospital is not at all a happy one, though I realize I was treated as well as any mental patient is to-day; but I can quite honestly say that the bogey of electric convulsive therapy as imagined by some psychologists was not one of my bogies; though there were many I knew. No one suggested that shock therapy was a complete cure in itself, but it cut short my period off doctoring by at least three months. Purely selfishly I would prefer shock treatment itself to gas or ether anaesthesia or to dentists' drills, and no one has suggested that they are not "ethical."—I am, etc.,

"DOCTOR-PATIENT."

### Diet in Hospital

SIR,—From my own limited experience I heartily endorse the view expressed in the second paragraph of his letter on p. 690 of your issue dated Nov. 27, 1943, by Wing Cmdr. H. M. Stanley Turner so far as civil and military hospitals in India are concerned. I have never understood the rationale of doping patients with drugs and starving them of the necessary salts, vitamins, amino-acids, etc., which would be present in a well-balanced and properly cooked diet. A hospital kitchen should be in charge of a competent "chef," and all modern arrangements for bringing the food rapidly and in excellent condition from the kitchen to the wards should be perfected. I was in the process of proving by statistics the value of the close supervision of the diet on the death rate and the length of stay in the hospital of prisoners in a jail hospital when the work was interrupted by military service. My figures remain as a result open to the objection that the period covered was not long enough to exclude the influence of climatic variations, etc.—I am, etc.,

Poona.

F. R. W. K. ALLEN.

### Regulation 33B

SIR,—Your leading article on Regulation 33B (Feb. 12, p. 223) seems to suggest that the real meaning of the regulation is not to compel treatment but to suggest it—persuasion, not compulsion. Well, Sir, if this regulation is not meant to compel infected prostitutes to obtain treatment then the public has been very much misinformed, and the public will be very much disappointed. I am all for the *suaviter in modo*, but let it be followed by the *fortiter in re*.

In the House Miss Horsbrugh said that the figures quoted by Dr. Summerskill (2 men and 64 women) were of those who had refused treatment and on whom a notice had been served. What was the fate of these 66 people? How many presented themselves for treatment? How many were prosecuted? Why not tell the public these things? Miss Horsbrugh also said that medical officers had had an idea that if they "interviewed people and asked them whether they were aware they had this disease there might be subsequent actions for slander."

Miss Horsbrugh was referring to medical officers of V.D. clinics she is wrong. No medical officer of a V.D. clinic would commit himself in that way *before* examining the patient. If, however, she was referring to medical officers of health, there was no need for them to interview these contacts. The fear of legal proceedings arose when a health visitor interviewed a contact on the evidence of one informer only. To safeguard the authorities the Minister "is using the power Regulation 84 gives him to permit disclosure," as you say. So we can get on with the *suaviter in modo*.

You say "the elaborate and rather repulsive procedure for compulsory examination and treatment is hardly ever used." Sir, the procedure is neither elaborate nor repulsive. It is simplicity itself. If two persons inform against a contact the V.D. officer completes Form I and sends it to the medical officer of health, who thereupon requires the contact to submit to examination within ten days. The reason this procedure is so seldom used is that, in my experience (and as I pointed out in my letter to the *Journal* of Jan. 2, 1943, p. 21), in civil life it is most exceptional to find two patients who are able and willing to testify to infection from the same source,

and it is not possible, therefore, to comply with the requirements of the regulation. And so the *fortiter in re* does materialize.

One word about the high incidence of syphilis. There is going to be a terrible harvest of congenital syphilis if steps are not taken in time to prevent it. If the Ministry of Health were to issue instructions to all health authorities to make a routine Wassermann test a part of all ante-natal examinations we should go a long way towards prevention. No Act of Parliament is required for this.—I am, etc.,

Treatment Centre, Royal Infirmary, Sunderland. NOEL F. ROWSTRON.

### Principles of Reform in Medical Education

SIR,—Dr. F. M. R. Walshe's article (Feb. 5, p. 173) comes as an invigorating and provocative stimulus to those of us interested both in the training of medical undergraduates and in the future of the theory of medicine. I wish to make two points only, the first, a particular one, concerning the teaching of psychological medicine to students, and the second, a more general one, in reference to, as he puts it, "old branches of medicine that have taken new names and adopted new slogans."

I am grateful to Dr. Walshe for saying that the "wise infusion of medical education by the principles of psychological medicine demands something more fundamental than the compilation of a long list of titles of lectures and appointments." He has laid his finger on the weakness of many psychotherapists' teaching to students, who claim this teaching as their province and at the same time work alone. I am already convinced that this infusion can be obtained without adding to the curriculum at all. The material is there in the general hospitals, but with few exceptions the teachers are not. I find in my weekly out-patient clinics I have seen during the last 12 months 125 cases of psychoneurosis out of a total of 420 new patients in the general medical clinic, and 17 out of 312 in the neurological clinic; in my wards also many patients' recovery is delayed by their unfortunate emotional reaction to organic illness. I am sure such figures are general and I feel that adequate postgraduate training in psychological medicine would ensure that this material could be successfully used by physicians in the course of their general medical teaching. This reform might at last destroy the prejudice that makes a Babinski response more interesting and more worthy of therapeutic attention than a flood of tears.

Dr. Walshe pleads for forthright precision in language and thought, suggests neurology and cardiology as the forms of medicine in which teaching has emphasized disordered function and attacks psychological medicine for its internal conflicts: its state of fermentation, and its incoherence. At least its leaders have usually recognized that diseases are not concrete things. Dr. Adolph Meyer in 1906 in the columns of the *Journal* defined mental illnesses as reaction states and first correlated personality with psychosis. For clarity, coherence and forthright precision I should like to quote a more recent authority. "Psychoneurotic persons are potentially 'normal' persons, in whom the reaction to life is overly tense, overly symbolized, unhealthy, and disturbing. Psychotherapy should be directed at removing excessive stress, eliminating immature and unhealthy personality traits, and substituting mature and healthful reaction patterns with which to meet any future stresses."<sup>1</sup>

My second and more general point briefly concerns the dangers of adding specialized courses to the curriculum. There is a tendency in medicine to-day to turn away from disease to health, which I believe to be essentially right and long recognized as necessary by many of us. This concept must run like a thread through all clinical teaching and bind medicine together in one progressive whole. The creation of so many new departments rather than the reform of the old suggest an unfortunate cleavage of the profession into those who, for example, teach social medicine rather than clinical medicine. I await uneasily the possible election of one of our number to a "chair of rehabilitation"—another professor, another department, another course. Perhaps, however, better-adjusted endowments will one day spread more widely clinical professorships and so even up our universities in this respect.

<sup>1</sup> *The Therapy of the Neuroses and Psychoses*, by S. H. Knapp, H. K. Kingston, London, 1943.

Finally, let us by all means take the students to the factories, to the welfare clinics, to the schools, to the special hospitals and health centres, but do not let us add "courses" to their clinical work, and do ensure that we teach them that all medicine is social, all health positive, and all treatment rehabilitation.—I am, etc..

A. BARIAM CARLIS

Staines County Hospital, Ashford, Middlesex.

SIR,—The masterly article by Dr. F. M. R. Walshe (Feb. 5) shows that it will not be possible in the future for a conscientious student to master as much of the subjects in the time allowed as his teachers will require. Therefore for qualification in a reasonable time we shall have to arrange for a degree or diploma to be given much earlier, say, after 3 or 4 years, and the specialties to be studied later, if so desired. The student will have to be given courses in medicine, surgery, etc., equivalent to first-aid classes, lasting, say, a year in all. Of the preliminary sciences he need know little more than he may have learned at school, provided by then he has learned how to work. Our next care should be to see that his brains and memory are preserved, not shattered, as is so often the case at present. For instance, why need he know the intricate details of all pathology? Conversely it is not really necessary for a medical pathologist or bacteriologist to be a doctor. There should be no examination system because it spoils the mental outlook and interest in a subject, but rather an apprenticeship with reports by the teachers as to when the student may be released to the departments where there are patients. At this work he should remain for two years, and again by report become a qualified doctor. The succeeding years of practice and experience may then be partly occupied with progress in any desired subject with a view to specialization. For under such a scheme there would have to be specialists.

It has always seemed to me that in the past we have planned our courses and teaching in a wrong manner. Both should be based, or largely based, on the frequency of disease. Certainly the probability of the condition being met with in practice should be stressed. The student's mind is by nature a collector of rarities, useful, no doubt, to solve a difficult scientific point, but otherwise just interesting mental junk. Lately a doctor asked his locumtenent to treat a man with a cold, but the locumtenent said quite seriously that he would prefer to have a case of leprosy if one were available.

Then again, why need a factory inspector be a doctor? Such a functionary only needs to be able to see where and why dirt or infection lies, or how such-and-such a nuisance or infection or accident may be prevented. In the proposed scheme he would get there earlier and qualify for a pension sooner than if he had to undergo a minimum training of 5 years. But I maintain he need not be a doctor!

The modern trend of psychological study and a desire to imbue doctors with it, though in the past the results without its prevalence have really been excellent, should, I think, be resisted until psychologists are able to describe their cases in language that can be understood by the average man.

Briefly, the total quantity of technical matter to be inculcated and absorbed to-day is so vast that the task becomes impossible if the mind is to survive. We shall have to approach the whole business in a new way somewhat as indicated above. This course would tend to foster reflection and research in a proportion of students.—I am, etc.,

London, W.1.

G. H. COLT.

### The General Practitioner and Physical Medicine

SIR,—During and following the last war the value of physical medicine as an adjunct in the treatment of various illnesses was proved. For some reason or other its value was forgotten, or at any rate was relegated to the limbo of forgotten things. During this war physical medicine is again taking its rightful place, and our men and women of the Forces are being trained gradually to appreciate its value and its limitations. On their return to civil life they will expect the same efficiency. I think we should now consider these future problems, for we shall have to face them when peace comes. The general public, too, is getting to hear of physical therapy and is appreciating its value.

Physical therapy employs massage, exercises, various forms of heat, and other externally applied treatment. It has become a major part of the rehabilitation programme for the war-wounded, and centres are already established in various areas over the country. General practitioners should be given an opportunity to attend lectures and practical demonstrations dealing with the various modalities used in physical medicine. They would see how, particularly in the rheumatoid diseases (but not only in these conditions), the response of the patient is proof of their efficacy. It is high time that we had a centre for postgraduate instruction, similar to those centres which exist in the U.S.A. The general public must be educated too. General practitioners who are interested and undergraduates who are being sent out from the various colleges should make their patients "physico-medically" conscious, and in this work our able "Radio Doctor" can be of enormous help, as well as our newly formed British Association of Physical Medicine.

The time has come when the patient should no longer be sent to the hospital out-patient department with the note, "Will you kindly arrange for electrical treatment," because the patient prevailed upon the doctor to do so. The doctor must know when physical therapy is indicated and when it is contraindicated, for it is only then that we can truly say to our patients that we have used all the medical armamentarium at our disposal. If we could find some philanthropist and eminent adviser to our Government who could come to our help so that a survey of the whole field of physical therapy could be carried out under a chosen medical committee, we would then be in a position to widen its usefulness in the prevention and cure of illness. The ethical development of physical medicine as a part of organized medicine lies in the hands of the general practitioner.

The types of patients treated are those with musculo-skeletal injuries seen in civilian life, back injuries, sprains, strains, dislocations, together with fractures, burns, etc. The steady return of war casualties will constitute a need for trained general practitioners, able to guide and advise as to the treatment necessary for the condition present. This need will increase and we must be prepared.—I am, etc.,

London, N.13.

MYER FISHER..

### Control of Pharmacological Products

SIR,—There are already signs that the manufacturing chemists are planning to exploit or "develop" (in the trade sense) the sulphonamides, as they have in the past exploited the barbiturates. War conditions are at present hindering this tendency, but as soon as peace is restored it seems certain that exploitation will increase unless some control is instituted.

The process of "development" is only too familiar: the firm's chemist produces a slight variation of an existing compound (a relatively easy matter in organic chemistry), next a very inadequate clinical trial is staged—often by the offer of free supplies—the compound (with a fancy name) is boosted by every device of the firm's advertising department, until, finally, the "sales resistance" of the practitioner perforce collapses.

Before this bewildering array of good, bad, and indifferent remedies is thrust upon us action should surely be taken, and now is the time while the condition is still "operable." Either the Ministry of Health or the Medical Research Council or the Pharmacopoeia Commission could institute a sufficient measure of control that would benefit the community as a whole.—I am, etc.,

Moor Park.

ROBERT C. TAYLOR.

### Stinging Fish

SIR,—In the review of Dr. Muir Evans's book *Sting-fish and Seaferar* (Feb. 5, p. 186) mention is made of the black scabbard fish. As it is little known here it may be mentioned that under the name of "espada" it is frequently served up in the hotels of Alameda, and in the fish market at Funchal I saw several for sale. Elongated, black, and glistening, the fish suggest lengths of india-rubber, and they are frequently carried borne tail to mouth, suggesting so many tyres. They inhabit the ocean abyss at depths of more than half a mile, and have the large eyes so characteristic of deep-sea fauna.—I am, etc.,

Manchester.

GRAHAM RENSHAW.

## Obituary

FRANCES IVENS KNOWLES, C.B.E.  
CH.M.(Hon.), M.S., F.R.C.O.G.

Mrs. Ivens Knowles (Miss Frances Ivens) died on Feb. 6 after a brief illness. She had been a member of the B.M.A. for 43 years, was vice-president of the Section of Gynaecology and Obstetrics at the Annual Meetings of 1912 and 1920, and served on the Ministry of Health Committee of the Association; she was also a member of the Consultative Council on Medical and Allied Services set up by Lord Addison, the first Minister of Health. A colleague sends the following account of her career:

Mary Hannah Frances Ivens studied medicine at the Royal Free Hospital and in Dublin and Vienna, and graduated M.B. with honours and gold medal at the University of London in 1900. She took the M.S. degree three years later, and had seven years' surgical experience in London before she was appointed in 1907 gynaecological surgeon to a new unit in the Liverpool Stanley Hospital—the first woman to hold an honorary post in a Liverpool hospital. There she built up a large gynaecological out-patient department, and kept her ward beds filled with patients, who still testify to her care and skill. Later she was also appointed honorary surgeon to the Liverpool Samaritan Hospital. Then came the last war, when she volunteered at once for service in Belgium, but had to return without landing. In December, 1914, she went to France as head of the unit of the Scottish Women's Hospital, which worked in the Abbaye de Royaumont under the French Red Cross. Miss Ivens devoted her great energy to this hospital, and soon the excellence of her work for the wounded French soldiers was recognized by the French Army, and to it the hospital became attached and was known as the Hôpital Auxiliaire d'Armée Française, 30, the beds being increased from 100 to 600. She continued as *médecin chef* till February, 1919, with only one period of leave in England, which she spent largely in lecturing to raise money for the hospital. In 1917 she was asked to open another hospital at Villers Cottreets. There she operated under shell fire during the German advance in March, 1918, until the approach of the enemy forced her to evacuate back to Royaumont. In recognition of these services she was decorated by the French President with the Cross of the Legion of Honour. In addition she received the Croix de Guerre with palm and the Médaille d'Honneur des Epidémies. This work in France was an outstanding achievement. The hospital had a great reputation, was inspected and approved by many French generals and Government officials, and this success was certainly due to the personality of its head and the devoted support she inspired in her staff.

After the war Miss Ivens returned to her hospital and large consultant practice in Liverpool, and threw herself with energy and enthusiasm into several new ventures. Chief among these was the rebuilding of the Maternity Hospital, to the honorary staff of which she had been appointed, the formation of the Liverpool and Women's Radium League, and the opening of the Crofton Recovery Hospital for Women. For these public services she was made a Commander of the British Empire in 1929, and Liverpool University bestowed the degree of honorary Ch.M. She always entered whole-heartedly into the local medical life, sat on numerous committees and spoke her mind, read papers at the Liverpool Medical Institution and North of England Obstetric and Gynaecological Society, wrote articles for the Press, and published a book on Caesarean section.

In 1930 she left Liverpool after her marriage, but continued a consultant practice in London till she and her husband retired to their home in Truro. However, her mental alertness and her excellent physical health did not allow her to rusticate. She served on hospital and Red Cross committees, took a part in the social life of the county, and did a great deal of hard work in the garden. She took to war work again in 1939, acting as medical inspector for the Red Cross in Cornwall and organizer of liaison officers who are looking after the

welfare of soldiers and their relatives. All this she was doing up to the time of her death.

Mrs. Ivens Knowles was a woman who led an active, busy life, but she had time for social functions, which she thoroughly enjoyed, and was renowned for her hospitality and charm as a hostess and conversationalist. It delighted her to give parties for those who were working with her in hospital or to take them to the theatre. She kept up her connexion with France by paying holiday visits to different parts of the country, by belonging to a French society where she met and conversed in their language with those French people living in Liverpool. Many of the "blessés" who had been in her hospital in France wrote regularly, and she met members of the staff at the annual dinner of the Royaumont Association, of which she was president, and just before her death she was doing propaganda work for the "Friends of France." She took an active part in the Medical Women's Federation, was president for a term of two years, and chairman of subcommittees, and was always ready to help and give advice to young medical women.

This long and full career was sustained throughout by unflagging mental and bodily vigour. She expected much from those working with her, and got it because she always did her share. Her kindness and sympathy to her English and French patients were rewarded by the admiration and devotion they showed for "the Lady Ivens" and "La Colonelle."

Dr. JAMES H. ORMOND died suddenly in his sleep on Jan. 9 at his residence at Lozells, Birmingham. He was aged 75. Educated first at Partick and Glasgow Academy, he graduated M.B., Ch.M. at Glasgow University in 1893, and after some years in general practice in Glasgow he settled in Birmingham in 1900, and worked for 44 unbroken years in general practice. Despite his advancing years, and quite unshaken by severe air raids in his area, Dr. Ormond carried on as usual, and it may truly be said that he died in harness.

Sir GOULD MAY, M.A., M.D., M.R.C.P., who died on Feb. 12 in his 81st year, was one of the distinguished sons of the late Right Hon. George May, Lord Chief Justice of Ireland. Educated at Rugby, Trinity College, Cambridge, and the London Hospital, Gould May had during a long career an extensive and very successful private practice in Belgravia. He was especially interested in gynaecology, and was for many years physician, to and later consulting physician to the Grosvenor Hospital for Women, Vincent Square, and to the St. George's Dispensary, Pimlico. During the last war the British Red Cross Society organized a hospital to work among our allies in Russia, and to this Gould May was appointed physician and the late Sir Herbert Waterhouse surgeon. On the return of this hospital to England Gould May became senior medical officer to the Russian Hospital for British Officers in South Audley Street, a most successful and popular hospital financed by a Russian lady, Madame Mouravieff Apostol. Gould May was knighted in 1923 on the recommendation of the Prime Minister, Mr. Bonar Law, whom he had attended for many years; he was also a Knight of Grace of the Order of St. John of Jerusalem. "Gouldie" was a keen sportsman and an expert fisherman, deservedly popular for his generosity and kindness of disposition among a large circle of friends.—A. M. W.

The late Dr. E. WINIFRED DICKSON was born in 1866 at Dungannon, Co. Tyrone, and educated in Belfast and London. After nursing her mother for a year she decided, with her father's encouragement, to go in for medicine. The School of the College of Surgeons in Dublin was just opened to women, and this she entered in 1887. She found that she was apparently capable of passing examinations easily, and, anxious to obtain a university degree, she applied for permission to enrol at Trinity College. Though supported by the medical faculty she was unsuccessful, owing to the opposition of the theologians. She therefore matriculated in the old Royal University of Ireland, and, carrying on both courses simultaneously, took her licentiate in 1891 and the M.B. in 1893, the latter with first-class honours and an exhibition. In the same year she was elected the first woman Fellow of the Royal College of Surgeons in Ireland and won a travelling scholarship on which she studied for six months in Vienna and Berlin. While abroad she applied for a resident post at the Rotunda, but the managers refused to appoint a woman. On her return to Dublin she put up her plate first in St. Stephen's Green and then in Merrion Street, and was appointed gynaecologist to the Richmond, Whitworth, and Hardwicke Hospitals, and assistant master of the Combe

Lying-in Hospital. In 1896 she took the M.D. and the membership in obstetrics, both with honours, and was appointed an examiner in midwifery to the Royal College. She wrote a number of papers in her specialty, but her interests were not confined to it. She married towards the end of 1899 and unlike some of the feminists of the day, decided that she could not continue to practise. In 1915, however, with her husband on service and her children at school, she came back first as an assistant in Rainhill Mental Hospital, and later as a war deputy at Ellesmere, Shropshire, where, in addition to general practice, she acted as M.O.H., and visited the local service convalescent hospitals. Later she bought the practice and took on a more active assistant, but in 1919 an attack of bronchopneumonia forced her to give up this. Thereafter medicine took second place to the needs of her family, but she spent two years in practice in London, at Siena, Italy, and at Leobach, West. In 1930 illness again made her stop for a time but for several years she went to South Wales as a part-time clinical assistant to a mining community for whom, and more especially for the womenfolk, she had the greatest sympathy. Twenty-five years after her first wartime locumtenency she was again called to the staff at Rainhill, and there she continued to follow duty up to within two months of her death at the age of 77. She can be numbered among the pioneers who helped to remove the prejudice against women in the profession and so made it easier for those who have followed her. A correspondent writes: I only met Dr. Dickson in her old age but there was a vigour and vitality about her and a directness of opinion and expression which are unusual and refreshing. With this strong personality went a very remarkable unselfishness, and it was characteristic of her that, knowing for several months that she had an incurable carcinoma, she not only made no mention of it to her family but continued with her work until within a few weeks of her death.

## Medico-Legal

### AN M.O.H. VINDICATED

Acknowledgment that statements made by her against Dr. Adam Douglas Fraser Menzies, medical officer of health for Skegness, were entirely without foundation was made by Dorothy W. Hunter, former matron of the Skegness and District Hospital, in an action for slander brought against her at Lincolnshire Assizes. Hunter unreservedly withdrew any charge she might have made affecting the character and reputation of the plaintiff, and further stated that she had no justification for making any such charge. She submitted to judgment and to an order to pay Dr. Menzies his taxed costs of the action. Through Mr. C. L. Henderson, K.C., she expressed her profound regret to Dr. Menzies for the injury he had sustained by reason of the matters complained of in the action.

Mr. Arthur Ward, K.C., who, with Mr. J. P. Stimson (instructed by Messrs. Le Brasseur and Oakley on behalf of the London and Counties Medical Protection Society), appeared for the plaintiff, stated that the slanders were of a very serious nature. Dr. Menzies, a surgeon of 17 years' standing, was a member of the staff of the hospital where Hunter was the matron. Fortunately the doctor suffered no professional injury as no one who knew him believed the slanders. The sole purpose of bringing the action, since Hunter submitted to judgment on terms which had been agreed, was to vindicate his character.

Mr. Justice Charles said he was very glad indeed that the action, which was of a most serious nature, had been thus settled. Most shocking allegations, to which he was not going to refer, were made against a doctor of high reputation not on one occasion, nor two, but on three occasions. These allegations had been made, he imagined, deliberately, after consideration. "If these statements had been true," he continued, "and I now understand that they are a pack of lies, the duty of the defendant, who was a matron of a hospital, was to go direct to the police, for an allegation was made of a very serious criminal offence. How on earth a person in that position could, if she be in her right mind, have made a series of serious allegations against the medical officer of health, such as she did make, when she knew all the time that they were totally untrue—and now by her counsel openly in this court does say so—is quite inconceivable to me. I am very glad indeed that she has seen sense, and some sense of decency, at last."

The statement unreservedly withdrawing any charge Hunter might have made affecting the character and reputation of the medical officer was read by Mr. Henderson. The judge commented that he was satisfied with this statement, which, he said, amounted to unreserved withdrawal, admission that the statements were untrue and without foundation, and an expression of regret. Judgment with costs was given for Dr. Menzies.

## Universities and Colleges

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

#### BUCKSTON BROWNE LUNCHEON

The Buckston Browne Luncheon for Fellows and Members was held on Saturday, Feb. 12 (the eve of the 216th anniversary of John Hunter's birth), in the Great Hall of Lincoln's Inn with the President, Sir Alfred Webb-Johnson, in the chair, and for the second time lady Fellows and Members formed part of the large company. The guests included five members of the Government—Lord Woolton, Mr. Ernest Bevin, Mr. Henry Willink, Captain Crookshank, and Miss Florence Horsbrugh—and all were received in the ante-chamber by the President and the two Vice-Presidents, Mr. H. S. Souttar and Sir Gilling Ball. Before the assembly sat down a loyal message had been sent to the King as Visitor of the College, and afterwards an acknowledgment was received from His Majesty. The Princess Royal, an Honorary Fellow of the College, also sent a message, as follows: "Her Royal Highness the Princess Royal deeply regrets that she is prevented from being present in person at the luncheon to-day, but her thoughts will be much with all the Fellows and Members, and with their President. She has a lively recollection of the delightful occasion on which she last attended the Buckston Browne Luncheon and of the pleasure which it gave her, and she sends to all present her very best wishes and remembrances." After lunch, when the loyal toasts had been honoured, Mr. Souttar presented Mr. W. H. Collins for the award of the Honorary Medal of the College in recognition of many liberal acts, and particularly his great generosity in the endowment of the Department of Pathology in the College and the institution of a Chair of Human and Comparative Pathology.

The President's speech of general welcome and review of events passed from grave to gay and back again with his customary skill. In a reference to the Beveridge report and the forthcoming White Paper he said that the Royal Colleges had a special responsibility in regard to the consultant services and the standards to be required; their higher diplomas were accepted hall-marks throughout the Empire. For a generation the medical profession had been pressing for a comprehensive medical service for those in need of it. No one knew better than they the ravages of want. They therefore welcomed the Government's decision to provide this service, and if it were provided only for those who could not provide it for themselves half the difficulties would disappear. On behalf of the Council he greeted the five Ministerial guests and warmly thanked the Treasurer of Lincoln's Inn, Judge Sir Gerald Hurst, for his courtesy and that of the Benchers in lending their magnificent hall to their surgical neighbours and friends in Lincoln's Inn Fields. Among those he named as having honoured the College by their attendance that day were Sir Henry Dale, President of the Royal Society, Lord Moran, President of the Royal College of Physicians, Mr. Eardley Holland, President of the Royal College of Obstetricians and Gynaecologists, Sir Stanley Woodward, Master of the Society of Apothecaries, Sir Herbert Eason, President of the General Medical Council, Sir Henry Tidy, President of the Royal Society of Medicine, and Dr. H. Guy Dain, Chairman of Council of the B.M.A.; Surgeon Vice-Admiral Sir Sheldon Dudley, Medical Director-General R.N., Lieut.-General Sir Alexander Hood, Director-General, A.M.S., Air-Marshal Sir Harold Whittingham, Director-General, R.A.F.M.S., and Major-General Sir Ernest Bradfield, Medical Adviser to the Secretary of State for India; also Sir Edward Mellanby, Secretary of the Medical Research Council, and Sir Wilson Jameson, Chief Medical Officer, Ministry of Health, and the following representatives of Allied and Friendly Nations: Brig. Paul R. Hawley, Col. Elliott C. Cutler, and Col. J. C. Kimborough (U.S. Army Medical Corps), Capt. W. M. Anderson (U.S. Navy), Major-Gen. R. Lutton (Canada), Lieut.-Col. J. H. Anderson (Australia), Prof. S. Sarkisov (U.S.S.R.), Dr. Woo (China), Dr. H. A. Aksel, Lieut.-Col. B. Tugan, and Dr. Bekir Taskiran (Turkey), and Dr. Alvaro Pontes (Brazil).

The Minister of Health, Mr. Willink, in a serious speech lightly delivered, spoke of the affinities and common ideals of medicine and his own profession of law, of the family bonds which join him to doctors, and of his wish for full co-operation with the profession of medicine. Whatever the coming White Paper might contain they could rely on him to listen most carefully to what came from the R.C.S. and the sister Colleges. In everything that the Government would put forward for consideration and discussion probably nothing was more important than making the benefits of medical science available to every member of the community.

The last toast, proposed by Sir Gilling Ball, was that of the health of "the founder of the feast," Sir Buckston Browne, now nearing his 93rd birthday, whose vigorous reply, paying tribute to Hunter and Jenner and Lister, could be heard in every part of the hall.

## ROYAL COLLEGE OF SURGEONS OF ENGLAND

An ordinary meeting of the Council of the College was held on Feb. 10 with Sir Alfred Webb-Johnson, President, in the chair. Surg. Rear-Adml. G. Gordon-Taylor was appointed Thomas Vicary Lecturer for the year 1944. Mr. P. J. Moir, Mr. N. Sinclair, Mr. W. D. Doherty, Brig. A. H. Whyte, Surg. Cmdr. J. B. Oldham, Mr. B. H. Burns, and Surgt. Capt. Lambert Rogers were re-elected, and Mr. T. Twistington Higgins and Air Cmdr. Stanford Cade were elected Members of the Court of Examiners. Mr. W. Kelsey Fry was elected a Member of the Board of Examiners in Dental Surgery for three years as from March 9. The following were elected Examiners in Applied Physiology and Pathology for the Fellowship for the remainder of the Collegiate year 1943-4: Prof. R. J. S. McDowall and Prof. Samson Wright (Physiology); and Prof. Geoffrey Hadfield and Prof. W. G. Barnard (Pathology). Mr. Eardley Holland was reappointed as the representative of the College on the Central Midwives Board for a further year, as from April 1, 1944.

A Diploma of Fellowship was granted to W. H. Bond. Diplomas of Membership were granted to A. Brown, T. R. Farrimond, J. L. McKelvie, R. Milton, E. S. Shalom, T. R. Steen, M. J. Williams, and to the list of candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Feb. 12 (p. 239).

## UNIVERSITY OF BIRMINGHAM

The following degrees were conferred *in absentia* on Dec. 18, 1943, by special warrant:

M.D.—1 D. R. Humphries, C. F. V. Smout, C. C. Teall.  
Ph.D.—(In the Faculty of Medicine): R. A. M. Case, A. D. T. Govan.  
M.B., Ch.B.—13 Theresa Lazar, 131. Macnab, 2 Evelyn M. Crawford, 2 Margaret L. Hampton, 2 Margaret D. Thompson, 3 Kathleen M. Brown, R. A. Chand, Beatrice D. Cluley, Joan R. Collins, Kathleen M. Fox, K. H. Freeman, Ida C. Hughes, R. A. F. Jack, R. Lindop, Mary S. McGladdery, J. C. Miller, 5 J. M. Mynors, 3 Dorothy J. M. Readman, B. V. Robinson, 4 F. C. Williams, G. F. J. Williams, P. W. Woodcock.

1 First-class honours. 2 Second-class honours. 3 Distinction in paediatrics and medicine. 4 Distinction in medicine. 5 Distinction in midwifery.

## UNIVERSITY OF SHEFFIELD

The Council at its last meeting appointed Prof. E. J. Wayne, M.D., to be director of postgraduate medical studies. Prof. J. Crighton Bramwell, M.D., and Surg. Rear-Adml. C. P. G. Wakeley, F.R.C.S., were appointed external examiners in medicine and in surgery respectively.

## The Services

The *London Gazette* has announced the appointment as K.B.E. (Military Division) of Major-Gen. (temp.) E. M. Cowell, C.B., C.B.E., D.S.O., T.D., late R.A.M.C., in recognition of gallant and distinguished services in the field.

The *London Gazette* has announced the award of the D.S.O. to Capt. (temp. Major) (Acting Lieut.-Col.) A. Crerar, M.C., R.A.M.C., and the M.C. to Capt. (temp. Major) D. L. Lewis, R.A.M.C., in recognition of gallant and distinguished services in Italy; Capt. J. J. Sumner, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Burma.

## R.A.F. APPOINTMENTS

The undermentioned officers of the Medical Branch, Royal Air Force, have been granted the acting rank stated, from Jan. 16, 1944, while holding the appointment indicated:

Medical Officer	Acting Rank	Appointment
Air Cmdr. A. F. Rook, O.B.E.	Air Vice-Marshal	Consultant in Medicine
Air Cmdr. G. L. Keynes	"	Consultant in Surgery
Air Cmdr. C. P. Symonds, C.B.	"	Consultant in Neuropsychiatry
Air Cmdr. T. C. St. C. Morton	Air Commodore	Consultant in Pathology and Tropical Medicine
Acting Wing Cmdr. J. F. Bromley	Group Captain	Consultant in Radiology
Acting Group Capt. C. W. Flemming	"	Additional Consultant in Surgery
Wing Cmdr. T. K. Lyle	"	Local Consultant in Ophthalmology over-seas
Wing Cmdr. G. L. M. McElligott	"	Consultant in Venereal Diseases
Wing Cmdr. F. W. Roques	"	Consultant in Gynaecology
Wing Cmdr. R. R. Trail, M.C.	"	Consultant in Mass Radiography and Tuberculosis

## CASUALTIES IN THE MEDICAL SERVICES

Missing at sea.—Lieut.-Col. T. S. Eves, D.S.O., R.A.M.C.  
Died.—Temp. Lieut.-Col. Felix Smith, R.A.M.C.

## Medical Notes in Parliament

The Parliamentary Medical Committee has changed its title to the "Parliamentary Medical Group."

Dr. Charles Hill, Acting Secretary of the B.M.A., and Dr. George Buchan (Association of Medical Officers of Health) met the Parliamentary Medical Group on Feb. 14, explained the views of their Associations on the Education Bill, and suggested amendments. A deputation was proposed to the Minister of these amendments, and it is expected that the Group will sponsor certain which are in preparation.

Dr. Hill will meet the Parliamentary Medical Group on March 7 to discuss the White Paper on a National Health Service.

## The White Paper

Announcing on Feb. 17 the issue of the White Paper on a National Health Service Mr. WILLINK said the proposals described were those which the Government believed to be best calculated to achieve an efficient and comprehensive National Health Service. But they were proposals, not decisions, and the Government had promised that they should be discussed with all concerned and would welcome constructive criticism in Parliament and the country.

## Incidence of Venereal Diseases

Mr. WILLINK said on Feb. 10 that figures were not yet available for the year 1943 of the number of new cases of venereal diseases treated at local authority clinics. These diseases were not notifiable. Incidence of these diseases had increased since the beginning of the war, but the rate of increase had recently diminished. Regulation 33B, though this did not require statutory notification, had had an appreciable effect.

## Infant Mortality

On Feb. 10 Mr. WILLINK gave the following statement: Deaths per 1,000 live births of infants whose age does not exceed 24 hours, in England, Scotland, and Wales for the years 1935 to 1942, are as follows:

Year	England	Scotland	Wales
1935 .. ..	10.7	11.7	12.1
1936 .. ..	10.6	11.9	11.9
1937 .. ..	10.8	12.0	11.7
1938 .. ..	10.2	11.6	11.0
1939 .. ..	10.2	13.3	10.9
1940 .. ..	9.5	12.0	10.6
1941 .. ..	9.8	13.0	11.1
1942 .. ..	9.5	12.0	9.9
1943 .. ..			Figures not available

On Feb. 15 Mr. WILLINK informed Major Markham that the infant mortality rates for England, Wales, and London for 1941, 1942, and 1943 were as follows:

	England	Wales	London
1941 .. ..	59	70	58
1942 .. ..	50	58	51
*1943 .. ..	49	51	49

\*Provisional.

Major MARKHAM also asked what was the infantile mortality rate for Scotland for 1943; and the latest comparable rates for Iceland, New Zealand, New York, and Chicago. Mr. JOHNSTON said that the infant mortality rate for Scotland for 1943 was 65 per 1,000 live births. The latest figures available for the other places were: New Zealand (1942, Europeans) 29; New York City (1940) 35; Chicago (1940) 29; Iceland (1936, rate calculated by U.S.A.) 48.

## Education Bill: Nursery Schools

Consideration of the Education Bill by the House of Commons in Committee was resumed on Feb. 15. On Clause 7, which deals with the stages and purposes of the statutory system of education, Mr. KEY moved an amendment which, he said, would rectify a grave omission in the Bill—the necessary arrangements for the children who at present attended nursery or infant schools. Under the Bill junior pupils were to comprise all children under 12, and nursery schools were regarded as being outside the normal provisions for children. They were excluded from the categories of county or auxiliary schools, and were specifically included in the special schools for mentally and physically defective children. There was very grave danger that those who had been hitherto regarded as infants in the separate establishments between the ages of 5 and 7 would find themselves merged into the general primary arrangements



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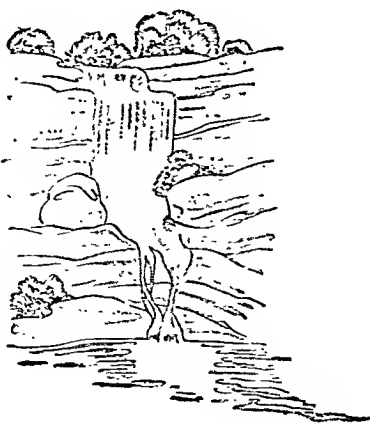
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and mixed with children from 7 to 11. The technique which had been worked out for dealing with the children in infants' day nursery schools had been a result of a scientific and psychological approach to child development. It would be a disastrous thing if the benefits of that were lost merely to get a merger of these two types of school. As soon as the attendance of the children over 5 was compulsory under the law, the one neglected, who would not receive the benefits of the nursery-school provision, would be the child under 5. The effect of trying to make small nursery schools near to homes would suit, almost inevitably, in an unqualified staff, and would cause a very harmful and unnecessary psychological break in the child's development. Dr. SUMMERSKILL, who supported the amendment, said it was difficult to understand why this system should have been divided into three stages—primary, secondary, and further education—and the preparatory stage absolutely neglected.

Mr. EDE said that this was a clause which tried to set out for the first time the conception that education was a continuous process. The Government believed that, where numbers made it possible, there should be a separate infants' department or children of compulsory school age under their seventh birthday. There must be elasticity in the system to allow any development from 5 to 7 to occur and so that their successors at some future date would be able to decide the appropriate age at which the preparatory stage should end.

The amendment was negatived.

The debate on the Bill was adjourned.

### Mass Radiography in Wales

On Feb. 15 Mr. JACKSON asked the Minister of Health how many extra beds had been allotted to meet the increased numbers of tuberculosis patients discovered by mass radiology in Wales, and if he was satisfied that the number was adequate. Mr. WILLINK said that it was not proposed that tuberculosis authorities should assign a quota of beds specifically to cases discovered through mass radiography. The proportion of persons examined by this method who were found to be tuberculous had to require institutional treatment was very small, and the mass radiography unit now operating in Wales should cause no substantial extra demand on sanatorium beds for some time to come. He was aware that tuberculosis accommodation in Wales and in other parts of the country fell short of what was desirable. Problems of building and staff were at present serious, but 240 additional beds for tuberculosis had been provided in Wales in the last eighteen months.

### Silicosis and Pneumoconiosis in Miners

On Feb. 15 Mr. J. GRIFFITHS asked the Minister of Fuel and Power how many miners have had to cease work at the mines in the past six months in consequence of being certified under the Silicosis and Pneumoconiosis Orders, and what steps were being taken to prevent the increase of this disease among miners. Major LLOYD GEORGE said that 819 workmen had been certified by the medical boards in the six months ended Dec. 31. It did not follow, however, that all these men had left the industry, and it would be necessary to make detailed inquiries to obtain precise details. He was aware of, and shared to the full, the concern felt about the increase in these numbers, but it was due almost entirely to the extension of the compensation scheme last July, which brought sufferers from pneumoconiosis within its scope. A number of expert committees, in addition to his own specialist inspectors, had the prevention of these diseases constantly under review, and on their advice he had made an Order conferring upon the inspectorate the power to require appliances to be installed for the suppression or extraction of air-borne dust below ground. This Order applied to South Wales, and came into operation on Jan. 1.

Mr. GRIFFITHS pointed out that in his own constituency 350 men were waiting to go before the board. He asked the Minister to increase the effort to combat this disease and, in particular, to see that what was being done was explained to the people concerned. Major LLOYD GEORGE replied that he would be very glad to do that. There was nobody more anxious than he to see every possible method of dealing with the disease used. He also promised Mr. Palmer to look into the question of the use of mass radiology.

Replying on Feb. 17 to questions by Mr. James Griffiths on the working of the Silicosis and Pneumoconiosis Orders, Mr. HERBERT MORRISON said that owing to the large increase in the number of applications to the medical board from South Wales miners examinations had been delayed. The strength of the medical board in South Wales had been doubled, and further assistance was being given so far as practicable. He recognized the desirability of doing everything possible to cope with the increased work, but claims on the medical profession at the present time made it difficult to secure the services of qualified men who could devote time to this work, and some

delay was unavoidable. As the result of discussions with representatives of the South Wales Miners' Federation he hoped that in future priority of application would be given to cases where the disease was advanced and the workman was incapacitated for work. The number of applications for certificates of disablement or suspension dealt with by the medical board under the Coal Mining Industry (Pneumoconiosis) Scheme, 1943, up to Feb. 5 was 1,285, of which 1,100 were in South Wales. The number certified to be totally disabled or suspended on account of the disease was 737, including 658 in South Wales. The numbers of applications from coal-miners dealt with by the medical board under the schemes of compensation and benefit under the Silicosis and Pneumoconiosis Orders for the year ended Dec. 31, 1943, was 2,645, of which 31 were from Lancashire and Cheshire. The number certified to be totally disabled or suspended on account of the disease was 1,281.

### Penicillin

Mr. CHARLES PEAT said on Feb. 16 that arrangements for the production of penicillin in Canada, the United States, and this country were co-ordinated by the Combined Production and Resources Board.

Major LYONS asked on Feb. 17 if the attention of the Minister of Health had been called to the production and use of home-made penicillin. Mr. WILLINK said that some research workers had published notes on so-called home-made penicillin. Small-scale production of this substance was attended by special difficulties of purification and standardization. He would certainly be glad to receive all information relative to the production and application of penicillin.

### Call-up of Doctors in Scotland

Sir EDMUND FINDLAY on Feb. 17 asked whether the Secretary for Scotland was aware that the Scottish Central Medical War Committee had sent calling-up notices to a number of doctors in the public health service, and whether the withdrawal of these doctors was justified on the grounds of national interest. Mr. JOHNSTON said the action of the Central Medical War Committee followed a recommendation by the Medical Personnel (Priority) Committee and was taken after careful local inquiry in the various local authority areas by his medical officers. He was reluctant to see any reduction in the Scottish public health services, but every effort had to be made to meet the urgent need for doctors to serve with the Forces. This might involve some temporary curtailment in the routine medical work of public health departments. He trusted that by co-operation with neighbouring authorities it would be possible to overtake essential public health duties.

## Medical News

Prof. B. A. McSwiney will deliver the Oliver-Sharpey Lectures before the Royal College of Physicians on Thursdays, March 2 and 9, at 4 p.m. His subject is "Afferent Fibres of the Abdominal Viscera."

A course of eight lectures on the physiology of the eye will be given at the Royal Eye Hospital, St. George's Circus, S.E., at 4.30 p.m. on Mondays, Feb. 28; March 6, 13, 20, and 27; April 17 and 24; and May 8, by Prof. Samson Wright and Dr. David Slome. These lectures are open to members of the medical profession and medical students.

The Ling Physical Education Association will hold refresher courses in (a) Leicester, on March 4, at the Newark Girls' Secondary School; (b) Bristol, on March 11, at the Red Maids' School, Westbury-on-Trym. At Leicester, Group Capt C. J. S. O'Malley will lecture on "Principles of Rehabilitation" at 11.15 a.m. Miss M. Forrester-Brown, M.S., will lecture on "Rest and Exercise in the School Curriculum."

Recently the Therapeutic Research Corporation of Great Britain, published a statement in regard to the mass production of penicillin. Lord Nuffield has been interested in penicillin since the discovery that the antibacterial properties of this extract of *Penicillium notatum* could be used for the cure of various bacterial diseases in human beings. At his suggestion the Nuffield Provincial Hospitals Trust early in 1943 undertook to make grants of £2,300 per annum for a period of five years towards the remuneration of the team of researchers working under Prof. Florey in Oxford. The University of Oxford accepted these grants from the Trust with gratitude. This action has been taken by the Trust with the concurrence of the Medical Research Council, which has been supporting the work for several years and is continuing to make a substantial grant for research expenses. Later, the Trust also agreed to make substantial grants towards the development of penicillin treatment of meningitis, brain abscess, and other pyogenic diseases of the central nervous system.

Specialists in the hospitals, higher salaries for nurses, and a new health education officer to supervise the teaching of hygiene in schools are among the items in Trinidad's health programme, on which £500,000 is to be spent this year. It is hoped that a start will be made on the island's £300,000 tuberculosis sanatorium. Two new health centres have already been built and the first rural dispensary is now being constructed. Three more health centres and eleven dispensaries are to follow. A child welfare centre established last year is proving very successful.

Queen Wilhelmina of the Netherlands has approved the appointment of Dr. J. E. Stanley Lee, M.B., F.R.C.S., F.R.F.P.S., of Wolverhampton to be an Officer in the Order of Orange-Nassau.

A grant of £28,600 has been made available under the Colonial Development and Welfare Act for a tuberculosis survey in Fiji. It is hoped to extend the survey to the British Solomon Islands Protectorate and the Gilbert and Ellice Islands Colony. The scheme will cover a preliminary survey only, mainly to determine the extent of the problem and the best means of dealing with it. A Government medical officer is undertaking preliminary work. A comprehensive scheme for the reorganization of the medical services of Fiji and the Western Pacific with assistance under the Act is contemplated, under which it is proposed to provide accommodation for 400 cases throughout the area.

The 50th anniversary of the foundation of the Johns Hopkins School of Medicine was observed on Oct. 2, 1943.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* notifications of measles rose by 243 and of scarlet fever by 104; those of diphtheria fell by 44.

The incidence of measles has mounted steadily during the past month, and the notifications are double the number at the beginning of the period. The only counties reporting a substantial rise during the week were Lancashire by 81, and London by 53, which together had 37% of the total notifications. There was a slight rise of scarlet fever throughout the country, but the only large local increase was Essex, with 43 more cases. The incidence of whooping-cough fell slightly in the north and rose slightly in the south, the balance yielding an increase of 12 for the whole country. After rising for five consecutive weeks the notifications of diphtheria fell by 44; there was a rise in Durham of 21, and a slight rise in the combined London and south-eastern region of 18.

With the exception of two areas, dysentery fell in incidence. The rises were in Surrey from 12 to 17, and Yorks West Riding from 10 to 27 (Aireborough U.D. 16). The other large returns were those of Lancashire 19, London 18, and Middlesex 17.

In *Scotland* scarlet fever went up by 24 cases, acute pneumonia by 17, diphtheria by 16, and whooping-cough by 10. The 41 more recorded notifications of dysentery were contributed, with the exception of 1 case, by 40 cases in Dunbarton County that occurred in January but had not been previously reported.

In *Eire* the notifications of diphtheria remained at a high level, and the incidence of measles rose by 52 cases: 199 of the 241 cases of measles were notified in Dublin C.B.

In *Northern Ireland* the notifications of scarlet fever went up by 20, with a total of 91 cases, 58 of which were reported from Belfast C.B.

### Vital Statistics of Scotland, 1943

The preliminary summary shows a birth rate of 18.9 per 1,000, 1.2 above the average of the five preceding years, and the rate was the highest since 1931. The infant mortality was 65 per 1,000 births and was the lowest rate ever recorded in Scotland, and 9 below the five-years average. Maternal mortality was 3.8 per 1,000 live births, 0.8 below the five-years average. The general death rate was 13.3 per 1,000, being 0.3 above the rate for 1942 but 0.2 below the five-years average. The death rate for all forms of tuberculosis was 79 per 100,000 and 59 for respiratory tuberculosis; these rates were respectively 1 and 2 below the rate for 1942, but 2 and 1 above the five-years average. The marriage rate was 7.6 per 1,000, which was a fall by 1.9 to the pre-war level.

### Week Ending February 12

The returns of infectious diseases in *England and Wales* during the week included: scarlet fever 1,870, whooping-cough 2,009, diphtheria 687, measles 1,245, acute pneumonia 909, cerebrospinal fever 62, dysentery 220, paratyphoid 5, typhoid 6. The deaths from influenza in the great towns numbered 51.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 5.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	71	4	23	4	—	110	9	32	2	9
Deaths .. ..	—	—	2	—	—	—	1	—	—	—
Diphtheria .. ..	733	35	187	145	26	897	31	233	126	43
Deaths .. ..	15	2	2	6	—	35	3	1	6	—
Dysentery .. ..	161	18	97	1	—	89	12	31	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	3	—	1	1	—	—	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	32	10	1	—	—	67	11	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	47	12	9	10	3	54	10	6	20	14
Deaths .. ..	—	—	—	20	—	—	—	—	—	—
Measles .. ..	1,162	206	113	241	1	15,363	933	380	17	68
Deaths .. ..	—	—	—	1	—	20	2	1	—	—
Ophthalmia neonatorum .. ..	70	5	19	1	1	85	3	28	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	9	1	(B)	—	—	8	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,115	69	27	4	3	1,530	86	36	1	4
Deaths (from influenza) .. ..	78	15	3	3	2	109	15	19	1	—
Pneumonia, primary .. ..	—	293	21	—	—	—	466	19	7	9
Deaths .. ..	51	—	14	9	—	71	—	—	—	—
Polio-encephalitis, acute .. ..	1	—	—	—	—	2	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute .. ..	7	—	—	—	1	3	1	1	4	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	11	13	—	—	—	2	27	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	185	5	10	—	1	183	6	16	1	3
Deaths .. ..	1	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,032	147	241	36	91	2,119	159	318	60	52
Deaths .. ..	—	—	—	—	—	3	—	—	1	1
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	5	—	2	5	2	9	2	2	7	—
Deaths .. ..	1	—	—	—	—	1	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,116	172	143	66	22	1,695	114	122	51	11
Deaths .. ..	13	1	1	3	1	14	2	1	1	—
Deaths (0-1 year) .. ..	438	58	74	59	20	440	53	63	40	19
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	4,981	799	669	246	144	5,236	832	719	221	139
Annual death rate (per 1,000 persons living) .. ..	—	—	15.4	16.1	†	—	—	16.2	14.5	‡
Live births .. ..	6,638	813	877	415	282	6,599	807	890	423	283
Annual rate per 1,000 persons living .. ..	—	—	17.8	27.1	‡	—	—	18.2	27.8	‡
Stillbirths .. ..	240	37	39	—	—	224	9	49	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	43	—	—	—	—	52	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Dyspepsia simulating Duodenal Ulcer

**Q.**—A woman aged 49 has for the last few years suffered from faint dyspepsia and epigastric pain two hours after meals, which is relieved by an alkaline powder. There is occasional tenderness over the appendix. There has been no loss of weight. The patient is constipated. Test meal shows a normal curve and the radiologist suspects duodenitis. What line of treatment should be followed?

**A.**—The case is probably an example of the comparatively common form of indigestion, possibly the result of duodenitis, which simulates duodenal ulcer, but in which there is no radiological confirmation of the diagnosis. The occasional tenderness over the appendix should not lead to its removal, which is more likely to do harm than good in the absence of evidence of recurrent subacute inflammation. The patient should be given the "post-ulcer regime"—the permanent routine for people who have had a duodenal ulcer which has healed under medical treatment.

1. A meal or feed (milk, plain biscuits, or chocolate) should be taken at intervals of not more than two hours from waking to retiring, and again if awake during the night.

2. The patient should eat slowly and chew very thoroughly. Adequate time should be allowed for meals, which must be punctual. She should avoid taking a meal when she is tired.

3. The patient should not smoke more than six cigarettes (or two pipes) a day, and these should be after meals. Cigarettes should have an absorbent plug in the mouthpiece.

4. During periods of overwork, and especially of mental stress, one day or half-day a week should be spent resting on a strict two-hourly diet. A sedative should be given if the patient is worried or sleeping badly.

5. If the patient gets a cold, sore throat, influenza, or other infection, bed-rest on a very light diet should be ordered until complete recovery.

6. Avoid alcohol, except (if desired) a small quantity of beer, light wine, or diluted whisky with (but never before) meals. Avoid pips and skins of fruit (raw, cooked, or in jam, and raisins, currants, figs, ginger, and lemon-pest in puddings and cakes), nuts, and unripe fruit. Avoid radishes and raw celery, tomato skins, stringy French beans, hard peas and beans. Coarse green vegetables must be passed through a colander. Avoid porridge made with coarse oatmeal, and rye. Avoid mustard, pepper, vinegar, curry, pickles, and chutney.

7. A teaspoonful of magnesium trisilicate should be taken an hour after meals and also whenever the slightest indigestion or heartburn is felt.

8. Isogel or liquid paraffin may be taken for the bowels if necessary, but no other aperient should be used.

9. No drugs in tablet form, no aspirin or vitamin, should be prescribed.

#### A Case of Rheumatic Fever?

**Q.**—A boy aged 18 has suffered from acute rheumatic fever for 12 months. He feels very well except that sometimes he has palpitations. His temperature persists in fluctuating between 99° F. and 98.2° F. in spite of salicylates gr. 20 given t.d.s. Should the salicylates given be increased, or should other treatment be adopted? He is, of course, still kept in bed.

**A.**—It is improbable that acute rheumatic fever has lasted for 12 months, especially in a boy who feels very well. Presumably there is no evidence of active carditis. The administration of salicylates solely for pyrexia is pointless and in this case ineffective. A prolonged course of 60 gr. daily may result in both palpitation and a low pyrexia. The first possibility to be envisaged is, however, the presence of focal sepsis such as often exists in the tonsils. If pyrexia is the only abnormal sign, salicylates should be stopped. If within a fortnight the temperature rises further and joint pains

appear the salicylate treatment should be reconstituted in doses of 20 gr. four times in the day and once in the night. Twice this quantity of sodium bicarbonate should be given concurrently. If, on the other hand, the pyrexia is unaffected or lowered by cessation of drug treatment the diagnosis of the present condition must be revised and the patient restored gradually to mobility.

#### Thiouracil for Hyperthyroidism

**Q.**—I would be glad of information concerning thiouracil, which I have heard is useful for thyrotoxicosis.

**A.**—Thiouracil is a fairly simple chemical substance which can be bought from the usual drug houses. It controls the symptoms of thyrotoxicosis, which are due to excessive production of thyroid hormone. Thiouracil given by mouth to patients prevents formation of thyroid hormone, though how it does so is unknown. The initial dose is usually 0.1 g. (or 1.5 gr.) given five times a day. After administration for 10 to 14 days the symptoms are greatly improved and the clinical picture changes. The heart rate and basal metabolic rate fall and the body weight goes up. The use of thiouracil must be controlled by determining the patient's basal metabolic rate every ten days, in order to determine the correct maintenance dose for each patient. After 3 weeks on the initial dosage it is usually necessary to reduce the dose to a daily total of 0.2 or 0.3 g. (3 to 4 gr.). Thiouracil occasionally produces a skin rash, but other toxic effects have not yet been described. Its administration can be continued for many months and possibly for many years.

#### Haemorrhage from Scalp Wounds

**Q.**—Most first-aid books teach the use of ring pads to control haemorrhage from scalp wounds with underlying fracture of the skull. Is their use recommended by authorities on head injuries? Are they being used in the present war for such cases?

**A.**—Ring pads are no longer used or recommended for the control of haemorrhage from a bleeding scalp. In an emergency the bleeding can be stopped by digital compression of the adjacent scalp on each side of the wound against the intact skull. The bleeding can also be stopped by haemostatic forceps, which are applied to the galea aponeurotica at intervals of 1 cm. and are then turned back over the skin edge. These can be left in position until the wound can be surgically cleaned and stitched up.

#### Intermenstrual Bleeding

**Q.**—A patient single, aged 32, has been troubled with her menses for years. She has the normal monthly period lasting six days approximately, and between each month has flow of lesser volume which lasts two to three days. Clinically she appears to be normal and I can find nothing wrong on vaginal examination. She looks well and is not anaemic, though she is easily tired while doing a full day's work. The condition is more of a worry than a great disability. Would treatment by hormone therapy help her, or do you class the case as physiological? Alternatively, vitamins A, D, and C have been suggested. What treatment, if any, do you suggest?

**A.**—This cyclical intermenstrual bleeding is almost certainly "ovulation haemorrhage." If so it should occur about the middle of a 28-day cycle. It is the result of a variation in the oestrogen production of the ovary during the change-over from the follicular to luteal phase, and is to be regarded as physiological and harmless. Its occurrence is the rule in the rhesus monkey and it is not uncommon in women—although the amount of bleeding is sometimes so slight that it passes unnoticed. The phenomenon should be explained to the patient and no treatment other than reassurance is required. If need be, however, the bleeding can be prevented by raising the oestrogen level of the blood over the period of ovulation. Stilboestrol 1 mg. t.d.s. by mouth or daily injections of 5 mg. oestradiol benzoate for two days before the anticipated onset of the bleeding should be sufficient. Injections of progesterone should be equally effective. It should be added that ovulation haemorrhage is likely to disappear spontaneously at any time.

#### The Varying Menstrual Cycle

**Q.**—With reference to your answer on the "safe period" on page 286 of the *Journal* of Aug. 28, 1943, and to menstrual periods of 21, 28, and 35 days, do these differing menstrual cycles correspond to different blood groups? The different blood groups are stated to correspond to different sizes of erythrocytes.

**A.**—There is no evidence to show that the length of the menstrual cycle is related to the blood group of an individual. The length of the cycle is determined by interaction between the anterior pituitary and the ovary. The pituitary gonadotrophins stimulate the ovary, whereas the ovarian hormones inhibit the pituitary; so once the cycle begins it proceeds automatically, although it can be influenced by nervous and other extraneous stimuli. So far as our knowledge goes at present the periodicity of menstruation is to be regarded as an inherent characteristic of an individual or as a manifestation of the individual's nervous and endocrine make-up. However, it is not an unchangeable feature, and is sometimes altered



after events such as the profound endocrine disturbance associated with pregnancy. It is therefore unlikely that the blood group, which is a constant factor, can have any bearing on menstrual periodicity.

#### Teaching Cleanliness to Infants

**Q.**—*At what age should an infant's training in cleanliness begin, how long should this take, and what are the successive steps, with due regard to modern psycho-analytic teaching? To what extent should discipline be used, and what form is recommended?*

**A.**—The subject has profound social implications, of which the questioner seems clearly aware. This answer, however, must be limited to practical points. It will be assumed that the question refers chiefly to sphincter control, and only secondarily to such matters as general cleanliness and tidiness.

Most children acquire spontaneous sphincter control at the latest by the time they are two years old. In a sense the problem is one dictated by our type of culture, which is intolerant of "dirt." The less anxiety and guilt about it is present in the adult's mind the more smoothly will unobtrusive cleanliness training proceed. It is a great convenience for the adult to begin "holding out" immediately after birth, as part of the general toilet after feeds. This appears to be accepted without opposition by the infant. It establishes a conditioned response the merits of which are its relation to the lenteric reflex and the saving of napkins. The chief point is that it must be done without fuss, not continued if the baby shows rebellion or distress, and failure should be taken with equanimity and without startled comment or emphasis.

The second stage comes often at nine months, when soiling and refusal to "oblige" seem to be part of the baby's healthy self-assertion. Here it is essential not to turn the situation into a battle of wills, and to avoid all fuss, anger however mild, or sorrow, despite the loss of the earlier "pseudo-control." It is probably wisest at this phase, which will pass, to adopt a *laissez-faire* attitude, and patiently, but not too promptly, restore the child to comfort. Smearing and playing with its faeces may occur and need occasion no alarm.

From twelve months onwards the discomforts on the one hand and pride and pleasure at production (magic word of our era!) on the other stimulate the child to excrete at the times when the pot is offered, especially if the adult shows, however unconsciously, her appreciation. The obvious delight in doing it at the wrong time must not be checked or connected in the child's mind with scolding or impatience. Later, after eighteen months, lapses will often cause spontaneous distress, and reassurance and an easy touch are required in handling. As mentioned, the problem usually ceases at this stage and may indeed resolve itself into the opposite one—retention and prolonged sessions. Occasional later relapses, up to five years or even later, usually at night or during illness or excitement, should be treated as of no significance.

In the matter of general urge of washing, etc., the widest differences are found. The average child very early comes to love its bath, which can be made the occasion of play and fun even for tiny babies. Pride and the ready imitation of adults rather than discipline and guilt should be the incentives to the much more resented face and hand washing of later childhood, which are also best incorporated in a routine, lapse from which is not made into an "incident." Clothing should be planned on the assumption that it is natural for little people to dirty them when they are busy. The pressure of civilization is so strong that in due time the normal child comes to conform to most of its canons.

Lastly, it may not be out of place to mention that sociological survey has shown the Japanese to impose the most rigorous excretory training on their infants. Need more be said?

#### Ptyalin in an Infant's Saliva

**Q.**—*We are told that ptyalin first appears in the saliva at about the eighth or ninth month—i.e., when the teeth begin to make the mastication and crushing of starch granules possible. Is this any indication for withholding starch from an infant's feeds until the teeth erupt? Is amylase present in the small intestine from birth, or does it make its appearance at the same time as ptyalin? How does the cooking of starch affect the matter?*

**A.**—Saliva plays very little part in the digestive processes of infants before the age of 6 months, but it is not true that ptyalin is absent from it until the age of 8 or 9 months. Saliva has slight starch-splitting power even at the age of 2 or 3 months. Amylopsin is present in the duodenum immediately after birth and before any food is given. Indeed Ibrahim showed that this enzyme was present in the pancreas of the six-months foetus. These facts and common experience suggest that there is no indication for withholding starch from an infant's food until the teeth erupt. Although it may not be desirable or necessary to put starch in a young infant's food, there is no doubt that it has the capacity to digest it from the earliest age. The cooking of starch renders it more easily digestible. Most of the proprietary starch foods have gone through a process of preliminary preparation or cooking which renders them more miscible and digestible.

#### Pin-hole Urinary Meatus

**Q.**—*Should an infant's pin-hole urinary meatus always be enlarged? I have not found an expression of views in textbooks consulted. In doing toddlers' clinics I find circumcision has been done and a pinhole meatus left untouched. The meatus tends to develop a scab obstructing urination and leading to dribbling. Does the meatus enlarge sufficiently with the passage of time, or with puberty?*

**A.**—A boy of 12 has been referred to me by his father for enuresis. He has a small though not quite pin-hole meatus; perhaps it is enlarging. His father says enuresis started at age 5, after pertussis, and the boy had hospital treatment (? belladonna extract) to age 11, without cure.

**A.**—As it has been established that an obstructed meatus in an infant may give rise to back-pressure effects upon the urinary system, it is advisable to pay attention to a pin-point meatus. The cause is the failure of proper canalization of the epithelial column from which the glans portion of the urethra is formed. Usually the passage of a moderate-sized probe on a few occasions is all that is necessary.

The problem of enuresis is a complicated one, about which agreement has not yet been reached. The psychological aspect at present claims most attention, but it is usually agreed that any physical abnormality, such as the question mentions, should be corrected, whatever other treatment may be adopted.

#### INCOME TAX

##### Debts collected Weekly

"INDUSTRIAL" asks as to the position of debts which have to be collected over long periods; must tax be paid on them before they are collected?

**A.**—Tax is due according to the amount of profits earned, whether received in cash or not. In many cases, however, practitioners make up their accounts on a "cash" basis, and the Revenue authorities have accepted this as an established custom, provided that the amount of the gross cash received can reasonably be assumed, taking one year with another, to be the same as the value of the debts put on the books. But once the "earnings" basis has been adopted the authorities are very reluctant to agree to a change to the legally incorrect but much more convenient "cash" basis.

#### LETTERS, NOTES, ETC.

##### Degeneration

Dr. C. G. GIBSON (Launceston) writes: Like the questioner in the first of "Any Questions?" in the *Journal* of Feb. 5 (p. 44) I am interested in, and thinking about, a disease which has been classed for many years among the "degenerations." He is interested in a case of "degeneration of the pyramidal tract"; I am interested in a case of "progressive muscular atrophy." For neither condition does there appear to be any treatment which can be described as curative. May this not in great measure depend on the fact that early investigators, in their attempts to arrange their ideas and to classify diseases according to the science of those days, were tempted, or forced, to use some such word as "degeneration," which ever afterwards seems to explain the cause of the condition, though the originator of the term knew quite well that it does nothing of the sort? In this inquisitive go-ahead age I think it would be an advance to give up the glib use of "degeneration" or "degenerative" in the nomenclature of diseases. "Degeneration" strikes me as resembling a dust-sheet put over something that has been shelved for future consideration.

##### Thumb-sucking and Tonsils and Adenoids

Dr. CHARLES BROOK (London, S.E.9) writes: I am informed that it is the practice of many medical officers at infant welfare centres to impress upon mothers the necessity for preventing their babies from sucking their thumbs, fingers, or fists, on the grounds that such a practice will cause enlarged tonsils and adenoids and irregular teeth. My experience with my own four children appears to contradict this theory entirely. The two who were suckers, not merely in infancy but up to the ages of 8 and 10, have never had enlarged tonsils or obstructive adenoids, and have perfectly regular teeth, while, on the other hand, the two non-suckers have had their tonsils and adenoids removed and one had to have corrective treatment for an irregular upper dentition. It would be interesting to learn whether other members of the medical profession with families have had a similar experience to the one that I have related.

##### Corrigendum

In the answer to the question on ergotamine tartrate for migraine, in the *Journal* of Feb. 12, p. 243, it was stated: "Ergotamine tartrate is now known to be useful for other forms of headache." "Now" should have been "not."

# BRITISH MEDICAL JOURNAL

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## CRANIAL-NERVE PALSIES WITH HERPES FOLLOWING GENERAL ANAESTHESIA

A REPORT FROM THE CENTRAL MIDDLESEX COUNTY HOSPITAL

COMPILED BY

J. H. HUMPHREY, M.B., B.Ch.\*

AND

MARGARET McCLELLAND, M.B., B.S., D.A.\*

During a period of four months 13 cases of cranial-nerve palsies following general anaesthesia have occurred at this hospital. The cases occurred in three small groups, with free intervals of four and nine weeks between. Two of the affected persons died, while the remainder are at various stages of recovery. The degree of severity varied from subjective trigeminal anaesthesia only to a complete picture of encephalitis, but the main features were remarkably constant and readily recognized. Twenty-four to forty-eight hours after use of a general anaesthetic the patient complained of a sense of coldness, numbness, or tightness round the lips, which in most cases during the course of the next two or three days had spread to involve the whole distribution of the fifth nerve on both sides. This subjective anaesthesia was usually associated with analgesia and anaesthesia over the same area, and in nearly every case there was difficulty in swallowing solid food owing to its "getting lost in the mouth." Three of the cases also showed motor fifth-nerve weakness. About the third post-operative day, in the majority, there appeared circumoral herpes of the febrile type. At this time, in those persons showing further involvement, affection of other cranial nerves became apparent—e.g., diplopia, facial weakness, palatal weakness, and tremor or deviation of the tongue. In those cases which showed improvement this began on the fifth to the tenth day, and the milder cases recovered rapidly (almost completely in a fortnight), whereas the severer cases still had residual subjective changes after five months. The herpes had disappeared by the end of ten days. On no occasion did we observe affection of the first, second (including rough testing of the visual fields), ninth, or eleventh nerve, but all the other cranial nerves were involved in one or more cases. Taste over the posterior one-third of the tongue was not tested, and the ninth nerve may have been involved. Only one patient had an extensor plantar response, and that was unilateral. None ran unduly high temperatures during the post-operative period. Six vomited more severely than we normally expect after operation, and five were noticeably depressed, listless, or confused for two or three days. Three only complained of severe headache. A typical history is that of Case 4.

### A Typical Case (No. 4)

A woman aged 25 was subjected to appendicectomy for acute appendicitis on July 30, 1943. Premedication was by morphine gr. 1/6 and hyoscine gr. 1/150. The anaesthetic employed was a combination of intravenous pentothal with cyclopropane and a little ether, given by closed circle with CO<sub>2</sub> absorption. The operation was a short one and the anaesthesia was without incident.

On Aug. 1 she complained that she had had a feeling of coldness of the face with double vision for 24 hours. At the same time there was some difficulty in opening and closing the mouth. On examination the left pupil was larger than the right. The reactions to light and accommodation were normal. There was double vision in all directions. The position of the false image indicated that the

diplopia was of third-nerve origin. There was no nystagmus and the fundi were normal. Hypo-algesia and hypo-aesthesia affected all the trigeminal field of each side. The corneal reflexes were diminished and the jaw-jerk was depressed. No muscular weakness affecting the fifth nerve could be detected. Subjectively the lips felt cold and the face numb and swollen. Food placed in the patient's mouth felt cold. There was bilateral facial weakness affecting the upper and lower face. No other abnormality could be detected in the cranial nerves. There was no neck rigidity or retraction.

The symptoms and signs remained unchanged until Aug. 2, when herpetic vesicles were found on the buccal mucous membrane on the left side of the mouth. These continued for three or four days. On Aug. 4 she complained of difficulty in swallowing. A lumbar puncture performed on the 6th yielded a clear fluid under normal pressure; no white cells were found. There was a gradual diminution in the cranial-nerve palsies; by Aug. 11 the difficulty in swallowing had disappeared, and by the 18th the diplopia had cleared. The scalp still felt abnormal. The skin over the forehead and the cheeks felt "swollen and stretched," and she complained of a peculiar tingling-sensation around the nose. The tongue and the teeth still felt cold and numb. The pupils were equal in size and the external ocular movements were full. Hypo-algesia and hypo-aesthesia were present over the whole distribution of the fifth nerve, but around the nose stimulation with a pin produced an exaggerated reaction. There was still left facial weakness. She was transferred for convalescence on Aug. 27.

The patient was seen again on Oct. 7. She stated that she had had transient diplopia, when tired, up to a week before her visit. The upper lip still felt "twice its size" and the eyelids and the forehead seemed heavy. Since her discharge on Aug. 27 she had noticed involuntary twitchings of both sides of the face, of very short duration. There was a slight degree of diminution of sensation to pin-prick on the right side of the face, affecting all divisions, with a slight left facial weakness. No other abnormality was found in the central nervous system.

Table 1 summarizes the clinical aspect of the cases. In it are included only those which showed definite cranial nerve involvement; but it should be mentioned that in association with them we encountered three cases of unexplained herpes developing about the third post-operative day, without complications other than severe headache or transient tingling of the lips. The clinical features require no further comment, except that involvement was usually (but not always) bilateral, and that in some the subjective fifth-nerve changes were accompanied by very definite changes in sensation to pin-prick, and light touch.

### History of Two Fatal Cases

Necropsies were performed upon the two fatal cases. Since Case 8 differed from all the others, a brief history is given.

#### Case 8

This patient was a woman aged 56. On Aug. 4, 1943, a cholecystectomy was performed, the anaesthesia lasting about one hour. She received premedication with morphine gr. 1/6 and atropine gr. 1/100, and anaesthesia (pentothal, nitrous oxide, oxygen, and ether) was maintained through a naso-tracheal tube by a closed-circle technique. The operation and anaesthesia were smooth and without incident. Post-operatively she was somewhat slow in returning to consciousness, and vomited rather more than is usual. Next

\* Other members of the staff contributing to the work were T. G. I. James, M.S., F.R.C.S.; H. Joules, M.D., F.R.C.P.; Miss S. Ransom, M.R.C.S., L.R.C.P., D.A.; W. Pagel, M.D.; and E. D. van der Walt, M.R.C.P.

day she was apathetic, and in the evening she became delirious, with twitching round the mouth during the night.

On the following day she was ill and confused. Her left pupil was larger than the right, and was fixed and inactive to light. There was bilateral fifth-nerve analgesia with absent corneal and conjunctival reflexes. She had a gross tremor of the tongue, and marked incoordination of the arms, which was worse on the right than on the left. Her condition gradually deteriorated, and bilateral facial

enlarged prostate, bronchopneumonia, and some general oedema of the brain.

**Histology.**—Occasional small capillary haemorrhages were seen in sections through the pons and midbrain, together with small perivascular collections of lymphocytes in the substantia nigra. In addition to the lymphocytic cuffing, macrophages containing haemosiderin were found in sections through the cerebellum. The upper part of the medulla oblongata contained occasional collections of

TABLE I.—*Clinical Summary of Cases*

No.	Sex	Age	Operation Date	Nature of Operation	Anaesthetic	Duration of Anaesthesia	Post-op. Vomiting	Herpes	Cranial Nerves Involved	Comment
1	M	53	23/6/43	Bone graft	Pent., cyclo., O <sub>2</sub> , induction—trileoe maintenance	1½ hours	—	—	Subjective V	Not discovered until 4½ months later
2	F	21	28/6/43	Appendicectomy	Pent., cyclo., O <sub>2</sub> , + a little ether	½ hour	+	+	V (all divs.) and motor XII	
3	F	19	28/6/43	"	" "	"	+	+	V (all divs.) and motor	Followed Case 2 on table
4	F	25	30/7/43	"	" "	"	—	+	III, V (all divs.), VII, X	
5	F	62	30/7/43	Cholecystectomy	Pent., cyclo., O <sub>2</sub> , + a little gas-O <sub>2</sub> , ether	1½ hours	±	+	III, V (all divs.), mainly subjective, X, XII	Followed Case 4 on table
6	M	41	2/8/43	Appendicectomy	Gas, O <sub>2</sub> , ether, "to-and-fro" (on circle machine)	½ hour	+	+	Subjective right V (all divs.)	
7	F	45	3/8/43	Laparotomy	Pent., cyclo., O <sub>2</sub>	½ "	+	—	Subjective bilateral V (1 and 2 divs.), R. VII	
8	F	56	4/8/43	Cholecystectomy	Pent., gas, O <sub>2</sub> , ether	1 "	—	—	III, V, VII, X, XII	Died in coma on 2nd post-operative day
9	F	46	17/8/43	Removal of cyst-adenoma of breast	Pent., trileoe + O <sub>2</sub> induction—cyclo. maintenance	½ "	+	+	V (all divs.), R. VII	
10	F	39	21/10/43	Hysterectomy	Cyclo., O <sub>2</sub> , + a little ether	1½ hours	±	+	III, V, VI, VII, VIII	Very severe headache. R. extensor plantar response
11	M	74	27/10/43	Cystoscopy and suprapubic cystostomy	Cyclo. + O <sub>2</sub>	½ hour	±	—	V (+ motor), L. VI, VII	Died on 16th post-operative day
12	F	18	27/10/43	Appendicectomy	"	35 mins.	—	+	V, R. VII	Under treatment for myasthenia gravis
13	F	35	27/10/43	Evacuation of uterus: severe blood loss	"	5 "	—	+	L. V, "transient" L. VII	Followed Case 12 on table

Pent.=pentothal. Cyclo.=cyclopropane. Gas=nitrous oxide. O<sub>2</sub>=oxygen. Trileoe=trichloroethylene.

weakness became apparent. During the afternoon she became stuporous, with jerking movements of the legs and arms. Lumbar puncture yielded 3 c.cm. of clear faintly yellow fluid under normal pressure: protein, 1.70 g. per 100 c.cm.; 14 polymorphs per c.mm. She died in coma at 10 p.m. on Aug. 6.

Necropsy was performed by Dr. W. Pagel 12 hours later: "The operation wound was sound. There was no gross abnormality of any organ except the brain, which showed marked oedema. Cultures of c.s.f. were sterile, and there was no meningitis."

**Histology** (Dr. Pagel).—There was no evidence of fat embolism anywhere in the parts examined. In all sections through the mid-brain and the floor of the fourth ventricle there was marked deposition of thready material in the perivascular lymph spaces (oedema). There were seen in addition a few vessels surrounded by a single row of lymphocytes, and a few capillary haemorrhages into the perivascular lymph spaces, together with collections of microglia in the neighbourhood of vessels. The ganglion cells in the central grey matter and the medulla oblongata were free from appreciable changes.

**Summary of Case.**—Marked oedema in the midbrain, pons, and medulla oblongata. Small capillary haemorrhages and beginning slight cuffing around the vessels. No changes in the ganglion cells. Portions of brain from the region of the affected nuclei were removed for animal inoculation.

#### Case 11

This patient, a man aged 74, was suffering from retention of urine due to an enlarged prostate (blood urine, 168 mg. per 100 c.cm.) and from chronic bronchitis with emphysema. He had auricular fibrillation, which was controlled by digitalis. A cystoscopic examination was made and suprapubic cystostomy performed under cyclopropane and oxygen anaesthesia, after premedication with morphine gr. 1/6 and atropine gr. 1/100. The anaesthesia lasted about three-quarters of an hour. Post-operative cranial-nerve involvement was extensive but not severe, and included the fifth nerve: subjective numbness in all divisions, with hypo-algesia and pins-and-needles sensation over the nose. His jaw deviated to the left. The palatal reflex was absent, although palate movement was normal. The sixth nerve showed slight left external rectus weakness, and the seventh nerve slight bilateral lower facial weakness. His chief difficulty lay in an inability to swallow solids, though he had no nasal regurgitation. Although suprapubic drainage was adequate he went progressively downhill. He was quite unable to swallow fluids towards the end, and died on the sixteenth post-operative day. At the necropsy, performed by Dr. Pagel, the only findings of significance were an

microglia in star formations. Oedema was also present, but was much less intense than in Case 8. The small haemorrhages might be due to terminal respiratory embarrassment. In photomicrograph taken of sections from the two brains the most noticeable feature in each case was probably the oedema of brain and brain-stem, although there was no clear histological evidence of the cause of the condition.

**Other Pathological Findings.**—Lumbar puncture was performed upon nine of the patients during the first week. The pressure was never raised, and in all cases the cerebrospinal fluid was bacteriologically sterile. In only two cases was there a small increase of polymorphs (10 and 14 per c.mm.). In four the protein content was 0.04% or less, while the remainder contained 0.055%, 0.07%, 0.085%, 0.09%, and 1.7%.

**Animal Inoculation.**—We were fortunate in obtaining the help of Dr. C. H. Andrewes, of the National Institute for Medical Research, who performed many of the inoculations. Cerebrospinal fluid from five cases and portions of brain removed at necropsy from two cases (some glycerinated, some filtered through a 0.7  $\mu$  membrane and held at  $-70^{\circ}$  C.) were injected intracerebrally or intratesterically into a total of 44 mice, 1 rabbits, and 1 rhesus monkey. No evidence of transfer of virus infection was obtained.

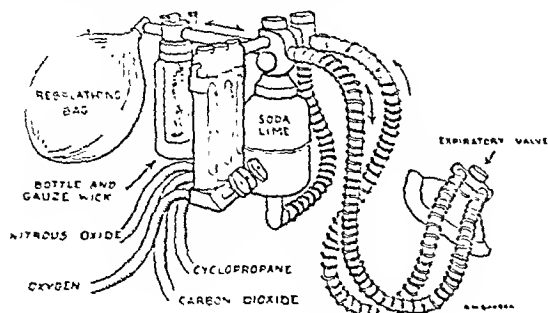
#### Theories of Aetiology

The cases described were operated upon by four different surgeons and anaesthetized by three different anaesthetists. None of them showed signs of anoxaemia or other complication upon the table. There was no evidence to incriminate any definite ward, but it was notable that all the anaesthetics were given in one theatre and all on the same type of machine. It seemed to us that the damage must have been directly due to the anaesthetic or to the lighting up of some latent virus infection, or both. The mode of anaesthesia and certain serological findings are presented with these possibilities in mind.

#### Anaesthetics

It will be observed from Table I that the anaesthetics were variable and that no one drug was common to all cases. The major surgery of the hospital is done in two operating theatres. The anaesthetic machine used in 12 of the 13 cases is one with which either a simple semi-open "to-and-fro" method may be used or else a closed-circle technique, with a soda-lime

canister incorporated to absorb the carbon dioxide. There is only one bottle on the machine. It contains a gauze wick. This wick retains a little of whatever anaesthetic drug has been in the bottle previously, and thereby contaminates the drug next used—e.g., ether following trichloroethylene, or vice versa (see accompanying diagram).



Although a number of tests had shown the bag and corrugated rubber tubing of the machine to be free of viable bacteria when swabbed immediately after use, this machine was sent to be sterilized in August. While it was away the same type of circle absorber was attached to a Boyle apparatus, and on this one case of palsy occurred (No. 9). In the other theatre a simple Boyle apparatus without soda-lime absorber is used, and on this there were no cases.

The anaesthetics administered were varied, but all except two were well-tried mixtures—namely, Cases 1 and 9, which received pentothal followed by cyclopropane and trichloroethylene, using the closed-circle technique. Ether, pentothal, and cyclopropane are drugs which have been used very extensively and have withstood the tests of time and experience. Trichloroethylene has been more recently introduced into anaesthetic practice, and has only been widely used in England since Hewer's report of 400 administrations and review of experimental work on animals (Hewer, 1942), although, in America, Striker and his colleagues were using it in 1935. Two reports of fifth-nerve palsy following the administration of trichloroethylene anaesthetics appeared during the past year (Hewer, 1943; McAuley, 1943). In the cases reported by Hewer impurities in the drug were considered to be the cause. Earlier reports in the German literature record cases of trigeminal palsy developing in industrial workers using trichloroethylene, toxic contaminants being regarded as a possible cause (Stüber, 1931; Jackson, 1934). Therefore, although this drug was used upon only two of our cases it was naturally suspect.

During the four months July to October 940 inhalation anaesthetics were administered in the two theatres, of which 600 were given in Theatre I (where all the cases occurred) and 340 in Theatre II. Each main drug, associated with others, was used in the following proportion of cases: ether 35%, cyclopropane 24%, trichloroethylene 16%, and pentothal 25%. Nitrous oxide was used in many and oxygen in all. On the circle machine in Theatre I there were 80 administrations of trichloroethylene, and on the Boyle apparatus in Theatre II there were 65.

These figures appear to give very little clue to the problem, but the occurrence of all the cases on the circle machine led us to suspect that a possible toxic agent might result from the interaction of traces of trichloroethylene with soda-lime or the other drugs used. It has been pointed out (Morton, 1943; Stüber, 1931) that chemical reactions may occur between trichloroethylene and alkalis, particularly when heated. Owing to its low volatility trichloroethylene is not regularly used on a closed circuit, but during the period under review this was done on several occasions (including Cases 1 and 9). It is also conceivable that in our anaesthetic machine (described above) trichloroethylene used by the "to-and-fro" technique might linger in the machine or in the gauze wick, and thus be carried over into the soda-lime when a subsequent anaesthetic was given by closed circuit. In either case there would be definite possibilities of chemical reactions occurring, especially since we have noted temperatures of the order of

70° C. in the soda-lime canister. Our suspicion was strengthened by the presence of an unusual sweetish penetrating odour frequently noted about the machine during this period. (The odour was subsequently reproduced by incubating trichloroethylene with soda-lime.)

Dr. H. E. Cox, D.Sc., F.I.C., undertook to analyse the drugs used, paying particular attention to possible chemical reactions or impurities. A summary of his report is as follows:

(1) The cyclopropane, ether, and trichloroethylene fulfilled the prescribed conditions of purity. (2) There is no evidence of any change, under the conditions of administration, in (a) cyclopropane or (b) ether which would cause injury. (3) There is evidence of reaction between trichloroethylene and soda-lime, and (4) this reaction produces dichloroacetylene. This substance readily combines with oxygen to form phosgene, carbon monoxide, and carbon dioxide, but does not further oxidize in the presence of sufficient excess of trichloroethylene. (5) The reaction is greatly stimulated by rise of temperature in the soda-lime; it proceeds markedly even at blood heat. (6) There is no evidence of direct formation of oxidation products in the trichloroethylene without soda-lime. (7) The effects of dichloroacetylene in trichloroethylene are not known, but should be ascertained. (Dichloroacetylene is a substance explosive in the presence of limited oxygen.)

Experiments are at present being undertaken to find out the physiological effects of the reaction products of trichloroethylene and soda-lime. Dr. Cox's observations have been confirmed by the Department for Research in Industrial Medicine of the Medical Research Council, which is meanwhile making investigations of the toxicity of these substances to rats. We ourselves have obtained some striking preliminary results with rabbits. The animals were subjected to anaesthetic mixtures consisting of trichloroethylene plus 0.5–1.0% dichloroacetylene or of ether plus trichloroethylene plus 0.5–1.0% dichloroacetylene given in the same way, and on the same anaesthetic machine as was used for the cases under review. Each animal received the mixture under test for three periods of about 20 minutes at five-day intervals. Anaesthesia was light, and difficult to maintain when ether was not used, and the rabbits appeared to recover quickly and to show no untoward symptoms. After the third anaesthesia one rabbit was killed by an overdose of anaesthetic, and the other was killed seven days later by stunning. Histology of both was very similar, and showed little change in any organ except the brain and the liver, in which there was slight necrosis. In the brain there was extremely marked perivascular cuffing and glial proliferation throughout, with numerous foci of necrosis. There was even a marked meningeal reaction, and the picture at first sight was one of encephalitis. We have never met such a histological picture in any other of our rabbit stock, and, although further work is necessary, have no hesitation in attributing it to the anaesthetic. On the strength of this preliminary evidence it would appear advisable not to use trichloroethylene in the presence of soda-lime.

#### Temperature

It is well known that when artificial hyperthermia is induced in normal persons a high proportion (about 70%) develop labial herpes 2 to 3 days later (Keddie, Rees, and Epstein, 1941). A combination of anaesthesia with overheating of the patient by heat generated in the soda-lime might have provided a possible explanation for the herpes, the palsies, and the peculiar incidence. In a number of cases the temperature in the rubber tubing leading to the patient was recorded, the maximum reached being only a few degrees above room temperature. The axillary temperatures of the patients rarely varied more than  $\pm 1^\circ$  F. during operation. Although none of these patients developed symptoms there was no evidence to support this idea as a possible explanation.

#### Virus Infection

The occurrence of herpes on the third day in nine out of the twelve patients who survived this period was particularly striking in view of the fact that none of them had colds or any other condition commonly associated with herpes, and that half of them after careful questioning denied ever having previously had this condition. Among other operation cases the incidence at that time, in the absence of colds, was very low.

The lesions were characteristic of herpes febrilis, consisting of numerous discrete vesicles upon the mucocutaneous junction of the lips, the chin, and occasionally the buccal mucous

membrane and soft palate. In four cases successful transfer to rabbits was obtained by intracorneal inoculation of vesicle fluid, and the strains behaved typically. One strain (Case 10) was studied particularly by Dr. C. H. Andrewes and ourselves, and was adapted to rabbit testicle and skin, to guinea-pig pads, and to mouse brain. None of the strains was particularly neurotropic in rabbits or guinea-pigs, although direct intracerebral inoculation in a rabbit produced death from encephalitis after some weeks.

Herpetic encephalitis in man has never been authenticated, although during the epidemic of encephalitis lethargica in Europe after the last war numerous attempts were made to incriminate the virus, and its isolation was claimed from the brains of the affected and of normal persons (Doerr and Berger, 1922; Flexner and Amoss, 1925). Studies by Andrewes and Carmichael (1930) and by Brain (1932) showed that 70 to 75% of hospital patients have antibodies to herpes in their blood. In the majority of such persons overt lesions can be produced by artificial hyperthermia, intravenous T.A.B. vaccine, lobar pneumonia, meningococcal meningitis, the common cold, etc. Herpes occurs occasionally after injection of the Gasserian ganglion (Harris, 1937).

All the cases showed a definite incubation period between operation and the first appearance of symptoms, ranging from 24 hours to three days. This is very short, by accepted standards, for a virus infection. The post-mortem findings, on the other hand, were not inconsistent with an encephalitis, and were comparable with descriptions of some of the findings in the encephalitis lethargica epidemic. In the absence of a completely satisfactory "toxic" explanation, it was considered worth while to investigate the sera of these patients for antibodies against the herpes strain from Case 10 and another strain isolated at the National Institute for Medical Research by Dr. Andrewes. The viruses were adapted to the rabbit's skin, and each serum was tested for its power to inhibit the production of lesions by 5 to 10 infective doses of virus injected intracutaneously. The results are given in Table II.

TABLE II.—Results of Tests for Antibodies against Herpes

Case No.	Herpes	Herpetic History	Time of taking Serum after Operation	Neutralizing Antibodies	
				Strain 10	M.R.C. Strain
1	—	—	13 weeks	+	+
2	+	—	19 "	+	+
3	+	—	6 "	+	+
4	+	—	4 days	+	+
5	+	—	3 "	+	+
6	+	+	Not done		
7	—	—	7 days	+	+
8	—	?	2 "	+	+
9	+	—	11 "	+	+
10	+	+	6 weeks	+	+
11	—	—	4 days	+	+
12	+	+	1 day	+	+
13	+	+	1 "	+	+

It is evident that every serum contains antibodies against both strains. The most significant samples are the early ones from patients without herpetic histories, since in these cases the formation of antibodies would have been too rapid to be due to the herpes occurring at that time, quite apart from the fact that some never developed the condition. Herpes antibodies are commonly found in persons with latent infection, and the implication is that all these patients had latent herpes.

We were not able to demonstrate any immunological difference between the two strains by cross-protection tests, and cannot claim unusual virulence for the strain 10 studied. If herpes or any other virus infection is involved it must have been "lit up" by the anaesthetic. There is some experimental evidence for this possibility in the observation of Fiala (1943) that subdural or intravenous injection of vaccinia virus in rabbits is not normally followed by encephalitis, but is so if the rabbits are under urethane anaesthesia; or the work of Silberstein and Hoff (1925), who showed that a normally latent encephalitis virus could be activated in dogs with an Eck fistula by feeding with a diet of meat only. Argument by analogy is dangerous, however, and in the absence of positive findings from the inoculation of post-mortem material into susceptible animals we are unwilling to do more than suggest the possibility that herpes virus played a part.

## Discussion

The clinical evidence favours two possible theories, or a combination of both, but the experimental results are strongly in favour of a toxic theory. If the latter is adopted there must have been great susceptibility, since one anaesthesia (Case 13) was of five minutes' duration and the patient developed well marked palsy.

The only drug which could be incriminated is trichloroethylene plus soda-lime, and this only on the assumption that it could have persisted in the machine or in the soda-lime between the anaesthesias in which it was used. On two occasions as long as three days elapsed between the use of trichloroethylene and the anaesthetic which was followed by palsies, and during the intervals there had been given nine and twelve closed-circuit cyclopropane or ether anaesthesias respectively on the same machine without any ill effects. On another occasion trichloroethylene was followed on three succeeding days by varied anaesthetics which developed palsies. Four closed circuits, but no further trichloroethylene, had meanwhile been administered. Seven only of the cases were associated with the use of trichloroethylene on the same day, and of these two actually received the drug in closed circuit. It should be mentioned that the soda-lime was periodically "rested" for any time up to two or three days, and the use of contaminated soda-lime at a later date might explain the intervals between trichloroethylene administration and the anaesthesias which were followed by palsies. We consider it to have been a definite possibility that the majority of the patients who were anaesthetized on the circle machine were subjected to this risk. The fact that only a small proportion showed symptoms would mean that there must be great variation in susceptibility. Such variations are well known in toxicology.

The first case of the series was missed until 4½ months later when a chance remark of the patient's drew attention to his lesion. It seems to us possible that mild cases may have occurred elsewhere, and the facts recorded above have been published in the hope that the observations of others may help to shed light upon the problem.

It is now over three months since we ceased using trichloroethylene in association with soda-lime, and although many trichloroethylene anaesthesias, some lasting up to three hours have been given, no further palsies have occurred.

## Summary

Thirteen cases of cranial-nerve palsy following general anaesthesia are reported. The nerves involved were mainly the fifth and seventh, but the third, fourth, sixth, tenth, and twelfth were involved in some cases. The condition was associated with labial herpes in 9 cases.

No anaesthetic drug was common to all cases, but all were administered on a circle absorber anaesthetic machine.

Evidence is given for chemical reactions between soda-lime and trichloroethylene in the system, with the production of dichloroacetylene.

Preliminary results show that this substance is toxic to rabbits.

Antibodies against herpes were found in the sera of all cases.

The aetiology of the condition is discussed. It is concluded that until further investigations have been made trichloroethylene should not be used where there is any possibility of its coming into contact with soda-lime.

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## REFERENCES

- Andrewes, C. H., and Carmichael, E. A. (1930). *Lancet*, 1, 857.  
 Brain, R. T. (1932). *Brit. J. exp. Path.*, 13, 166.  
 Doerr, R., and Berger, W. (1922). *Schweiz. med. Wschr.*, 52, 862.  
 Fiala, S. (1943). *Zbl. Bakt.*, 150, 260.  
 Flexner, S., and Amoss, H. L. (1925). *J. exp. Med.*, 41, 218.  
 Harris, W. (1937). *The Facial Neuralgias*, London.  
 Hewer, C. L. (1942). *Proc. roy. Soc. Med.*, 35, 463.  
 — (1943). *Ibid.*, 36, 463.  
 Jackson, D. E. (1934). *Anesth. & Analges.*, 13, 201.  
 Kiddie, F. M., Rees, R. B., and Epstein, N. N. (1941). *J. Amer. med. Ass.*, 117, N. 16.  
 McAuley, J. (1943). *British Medical Journal*, 2, 713.  
 Morton, H. J. V. (1943). *Ibid.*, 2, 828.  
 Silberstein, F., and Hoff, H. (1925). *Z. ges. exp. Med.*, 44, 257.  
 Striker, C., et al. (1935). *Anesth. & Analges.*, 14, 68.  
 Stüber, K. (1931). *Arch. Gewerbepath.*, 2, 398.



## HAZARDS IN THE USE OF THE CLOSED-CIRCUIT TECHNIQUE FOR TRILENE ANAESTHESIA

BY

S. CARDEN, M.B., D.A., D.P.M.

Within the past two years trilene (trichloroethylene) has been increasingly used as a form of general anaesthesia. It has certain advantages over ether and cyclopropane, such as non-inflammability, and it is regarded as safer than chloroform, for there is much less risk of ventricular fibrillation. When diathermy is necessary, particularly in the region of the head and neck, trilene commends itself as a suitable non-explosive anaesthetic agent. As a rule I have limited my use of trilene to thyroid and breast operation cases. Its use in a closed-circuit machine appears to fall in line with what is almost a routine practice of most anaesthetists—that is, the carbon dioxide absorption technique for inhalational anaesthetics. There are many advantages of such a method, the outstanding one being that a quiet operation field is ensured by the diminished respiratory excursions. In cyclopropane anaesthesia this technique is of course essential for practical and economic considerations. The purpose of this paper is to show that it is dangerous to use trilene with a closed-circuit technique.

### Illustrative Cases

**Case 1.**—Mrs. A., aged 67, a frail thin woman, was a poor risk for operation for stone in the hepatic duct. On Nov. 22, 1943, she was given premedication of omopon gr. 1/6 and scopolamine gr. 1/300; then pentothal g. 0.5, followed by endotracheal cyclopropane. The operation lasted 1½ hours, during which she was given 750 c.c. of plasma. No trilene was used in this case. The same apparatus, however, had been employed to administer trilene to a patient immediately preceding this one. In the evening following operation her temperature was 99° F. and she vomited repeatedly. This vomiting started 12 hours after operation and continued for three days, when she first complained of difficulty in swallowing and numbness over the face. She was seen by Dr. Wilfred Harris on Dec. 11, and I am indebted to him for the following neurological notes: "Slight diplopia in all directions. Left third nerve shows partial palsy, and the left pupil is sluggish. There is bilateral slight weakness of both external recti, with homonymous diplopia. The voice is markedly nasal and there has been nasal regurgitation, and the right soft palate is obviously paretic. Fifth nerve:—There is total anaesthesia to pin-prick and even hand pressure over both first divisions, and the right second division, including the hard palate. The left second division is totally analgesic to pin-prick, but hand pressure is felt on the cheek. Moderate analgesia of third division on both sides, mostly on the right. Total motor palsy, with complete jaw-drop, is present. There is loss to taste over the right second division on the palate, but taste on both sides of tongue is fair."

This patient had to have a gastrostomy (under local anaesthesia) on Dec. 26 because of the inability to swallow. The gastrostomy tube was removed after five weeks (Jan. 31, 1944), and she is now swallowing food reasonably well. Although her general condition has vastly improved, the fifth and other nerve palsies show slight improvement only.

**Case 2.**—Miss B., aged 50; operation, Dec. 6, 1943—local excision of benign tumour of breast. Premedication, omopon gr. 1/3, scopolamine gr. 1/150, pentothal g. 0.5 in bed were followed by a very short further induction with cyclopropane and by nitrous oxide, oxygen, and trilene, using the closed-circuit technique. The duration was only 20 minutes. About 12 hours after the operation vomiting started; this continued for 36 hours. On the evening of Dec. 7 the temperature was 99°, and lasted two days. In the early morning of Dec. 8 she complained of double vision, stiffness of the face, and difficulty in swallowing. Dr. Harris saw her on Dec. 11, and reported: "She has a bilateral third-nerve paresis, the right being practically complete. The right pupil is much dilated, with very little reaction to light or convergence. Fifth nerve:—She complains that the face feels hot and 'tingly' over both cheeks (second division). Nearly complete analgesia to pin-prick over first and second divisions of both sides, including conjunctivae, and upper gums and palate. No pain on pricking the inside of nostrils. No motor fifth-nerve weakness, the masseters and external pterygoids being strong. Little if any anaesthesia of the third division of fifth. Sense of smell good. She has no nasal regurgitation, the soft palate rises normally on phonation, and there is no analgesia of the pharynx; but there is a suggestion of slight palatal weakness, because she cannot blow out her cheeks properly." There has been only

very slight improvement in this patient eight weeks after the onset of the paralysis.

Both cases therefore showed well-marked bilateral trigeminal anaesthesia, oculomotor palsy, and also difficulty in swallowing, the latter symptom being more pronounced in Case 1.

In the first case the trigeminal paralysis was total for the upper two divisions, with a total motor fifth-nerve palsy. In this first case, too, the right half of the soft palate was completely paralysed (tenth cranial nerve), and though the oculomotor paralysis was less than in Case 2 there was additional weakness of both sixth nerves. Case 1 also showed scars of recent herpes on the right upper and lower lips, which strongly suggest that a "toxin" had affected the Gasserian ganglion. Dr. Harris pointed out that herpes frequently appears over the lips and nares after Gasserian alcohol injections.

### Discussion

On making inquiries it was found that a case immediately preceding Case 1, on Nov. 22, had pentothal, nitrous oxide, oxygen, and trilene, via a closed-circuit machine, for the removal of an adenoma of the thyroid; this patient subsequently vomited a good deal and complained of giddiness. She was seen a few weeks later, but there was no evidence of her having had any paralysis. It is worth emphasizing that Case 1 did not have trilene, and it should be noted—an important fact—that the soda-lime canister was not changed between the cases. Case 1 would thus have been exposed to a prolonged inhalation of any toxic products that may have formed in the soda-lime canister when the trilene had been administered to the immediately previous case. The idea that a toxic product had formed in that canister was suggested by the fact that between the dates of the first case (Nov. 22) and the second (Dec. 6) eight others were given pentothal followed by cyclopropane anaesthesia with the same apparatus, and with no ensuing paralysis. It seemed an extraordinary coincidence that on the only two days that trilene was used a patient developed paralysis. Also it was noted that only recently at this hospital, for the convenience of dispensary ordering, a change-over had been made to another well-known brand of soda-lime (B). This appeared to give very good absorption clinically; but it was noticed that the canister became much hotter than with the previous brand, A (sodalime soda-lime). Another point with Brand B was that when it was necessary to change the soda-lime it was often found to be caked, and sometimes had to be dug out of the canister; whereas Brand A could always be easily shaken out. This led to the conclusion that Brand B, though it gave very good absorption, was the more hygroscopic. Accordingly, a full investigation, and analyses, of the soda-lime, trilene, and cyclopropane were started, and Dr. H. E. Cox kindly undertook the chemical analyses. Results of analyses of the two brands were:

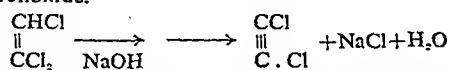
	A (Sodalime)	B
Calcium hydroxide .. ..	84.1%	77.6%
Sodium hydroxide .. ..	1.2%	11.2%
Carbonate (calculated as Na <sub>2</sub> CO <sub>3</sub> ) ..	4.8%	5.4%
Moisture .. ..	7.4%	3.0%

Equal quantities of the two were then exposed in a moist atmosphere at room temperature, showing:

	A	B
Water absorbed after 18 hours ..	0.54%	2.23%
" " " 66 " ..	1.35%	6.77%

It will be observed that the clinical finding that Brand B has a greater avidity for water is confirmed. Also, it is particularly important to note that the caustic soda content of B is more than 9 times that of A. The significance of the latter point is discussed shortly. In his analysis Dr. Cox found no evidence of any deleterious substances in the cyclopropane or trilene; but experiment showed that, whereas when cyclopropane was passed through soda-lime no reaction occurred, with trilene through soda-lime a reaction took place, producing a distinctive sour smell. This reaction took place slowly at room temperature and rapidly at blood heat. As I have personally recorded temperatures of 110° F. using Brand A soda-lime and 178° F. when using Brand B in the canister of a circle absorber under conditions of anaesthesia, it will be readily understood that any chemical interaction will almost certainly be considerably speeded by this increased warmth. Trilene is itself very reactive, and is a derivative of acetylene, which chemically is one of the most reactive compounds

known. Dr. Cox also pointed out that trilene with soda-lime produces new and potentially toxic products, one of which is dichloroacetylene. This is easily oxidized to phosgene and carbon monoxide.



Trilene heated with alkali produces dichloroacetylene, and experiment shows a recognizable formation of this at even 98° F. If the heating is continued in the open, the dichloroacetylene, being very volatile, disappears, but if a condenser is used the dichloroacetylene accumulates and there is an explosion, producing phosgene. But when an excess of trilene vapour or an inert gas is maintained, dichloroacetylene does not further oxidize, and no explosion or phosgene formation occurs. This explains the fact that experimentally no phosgene reaction occurred in the circuit of the apparatus. The distinctive smell noted above is almost certainly due to the formation of dichloroacetylene, the physiological activity of which is at the present time unknown, and it is dismissed in all the literature as spontaneously explosive.

The fact that Brand B soda-lime is shown to contain more than nine times the amount of caustic soda, that it is more hygroscopic, and that it generates more heat under anaesthesia supports the clinical observation that this brand would definitely be more reactive towards trilene, with the production of toxic oxidation substances. This view is supported by the clinical evidence that no case of paralysis occurred while Brand A of soda-lime was used at the hospital; and no case occurred when employing my own apparatus for closed-circuit trilene anaesthesia, in which Brand A has always been used. The high temperature generated by Brand B soda-lime, and therefore of the inhaled anaesthetic gases, is of further disadvantage to the patient; it leads to excessive sweating and capillary engorgement (Hewer, 1942) even at 104° F.

### Conclusion

The relatively low incidence of post-trilene paralysis is, according to the above facts, due to three factors:

1. Fortunately, the vast majority of administrations with this anaesthetic agent have been given in an open circuit. As there is no evidence of direct formation of oxidation products in the trilene without soda-lime, it seems that there is no apparent risk when trilene is used in an open circuit.

2. The high temperatures generated and recorded in the canister of a circle absorber during anaesthesia have been at the point of maximum intensity of reaction, usually after the soda-lime has been in use for about an hour. If the soda-lime has already been in use for some time we do not get these very high temperatures, which are an exciting factor in the oxidation of the trilene into toxic products.

3. The actual amount of caustic soda available for this chemical reaction with the trilene has been shown to be considerably higher in some brands of soda-lime. It appears to be the most important factor—apart from the rise in temperature—for this effect on the trilene.

McAuley (1943) describes three cases of bilateral trigeminal anaesthesia, and it is to be noted that in every case the closed-circuit technique had been used. Lengthy anaesthesia does not seem to be necessary for full toxic effect. In his cases the durations were 20 minutes, 30 minutes, and 1½ hours, and in one of my cases the anaesthesia lasted only 20 minutes.

### Summary

Evidence is brought that trilene anaesthesia in a closed circuit is dangerous, and may result in trigeminal and other cranial-nerve palsies. The palsies are disabling and may be permanent.

This danger is shown to be due to toxic oxidation products formed by the interaction of soda-lime and trilene.

This reaction is speeded by the heat generated in the soda-lime.

The exact caustic soda content and hygroscopic properties are shown to vary in different brands. This, it is indicated, is an important factor in the occurrence of these cases.

My grateful thanks are due to Dr. H. E. Cox for his help in these investigations. I also wish to thank Mr. Lancelot Bromley for much encouragement and for many helpful discussions.

### REFERENCES

- Hewer, C. Langton (1942). *Recent Advances in Anaesthesia*, 4th ed., J. and A. Churchill, London.  
McAuley, J. (1943). *British Medical Journal*, 2, 713.

## INTELLIGENCE AND SEASON OF CONCEPTION

BY

J. A. FRASER ROBERTS, M.D., D.Sc.  
M.R.C.P., F.R.S.Ed.

Director, Burden Mental Research Department, Stoke Park Colony  
Bristol; Temp. Surg. Cmdr., R.N.V.R.; Consultant in Medical  
Statistics, Royal Navy

Many studies have shown that there is an association between season of birth, or of conception, and intelligence. The evidence has recently been ably marshalled by Fitt (1941) himself the contributor of the most substantial body of data. Children whose time of conception is centred on the winter months are on the average somewhat more intelligent than those conceived during the other half of the year. After analysing the results of the various investigations, which naturally show a certain amount of difference in detail, Fitt selects for contrast (with suitable reversal in the Southern Hemisphere): (1) birth months May to October, corresponding approximately to conception months August to January; (2) birth months November to April, corresponding approximately to conception months February to July. Children falling into these two groups will for conciseness be described in this paper as winter and summer children respectively.

### The Alternative Explanations

Two explanations of the difference are possible: first, the season of conception influences intelligence; or, secondly, the intelligence influences season of conception. Now, it is a remarkable fact that, with one partial exception (so far as I am familiar with the literature), every investigator has assumed without discussion that the first explanation must be the correct one. Some of the hypotheses advanced are outside the range of orthodox biological opinion—for example, the "the higher metabolic level of parental protoplasmic vigor during winter cold seems to be transmitted through the germ plasma, and to exert a lasting effect upon the future course of the offspring." There would seem to be nothing inherently unlikely, however, in the assumption that the prenatal environment of the developing child is more favourable at one season as compared with another. This would be an interesting addition to the list of known non-genetic prenatal influences such, for example, as the well-known effect of advanced maternal age in mongolism, or the effect of being a first-born child in congenital pyloric stenosis (Cockayne and Penros 1943).

The partial exception to this unanimity of opinion is provided by Huntington (1938). His observations on such material as highly gifted persons have led him to postulate a favourable season which is different from that indicated by the large-scale studies. He is concerned to explain the discrepancy, and states (p. 325): "It seems highly probable that the three types here mentioned—namely, the passionate, the unintelligent, and the weak-willed—contribute more than their proportional share to the excess of births which still occurs at the height of the animal rhythm. We should expect many of the children of such parents to have low intelligence, and they might well suffice to overbalance the unusually bright children who are born at the same season, thus giving a low average I.Q." In regard to his main thesis, however, he is convinced that it is the season which affects intelligence. Thus he states (p. 441): "Our new knowledge as to season of birth can be of practical use only if we use it in one of two ways. First, we can change the present seasonal distribution of births. Secondly, we can discover the exact conditions which make certain seasons favourable, and then take steps to create those conditions in other seasons."

### Practical Importance of the Problem

Apart from the theoretical interest of the problem, the practical importance of deciding which explanation is the right one is not inconsiderable. Many writers carry the argument to its logical conclusion and urge that a planning of season of conception would aid in human betterment. To choose one example, Mills (1941) sums up as follows: "The findings reported in these pages have a very direct bearing

upon human eugenics. Present-day civilization is dominated much more largely by mental achievement than by physical, hence the importance of stressing eugenic factors that promote mental functions. It would seem highly desirable, therefore, that parents keep in mind the advantages offered their offspring by winter conception. Even the best hereditary background may be made much more effective if supported by proper season of conception."

It is true that the average difference is a small one, but many persons might reasonably feel that the demonstration of a real advantage attaching to one season was an indication that it is physiologically preferable for mother and child that conception should occur during the winter months.

If, however, the alternative explanation is the true one, and it is the intelligence of the parents which influences season of conception, the intelligence of the children of any particular pair of parents would be entirely unaffected. In fact, if Huntington is right (I have no data to offer in this connexion), advice based on the mass studies would be not only useless but positively harmful.

#### A Crucial Test

Perhaps the simplest way of distinguishing between the two possibilities is the method suggested above. Children born to the same parents can be compared—i.e., winter children can be compared with their summer brothers and sisters. If season of conception influences intelligence the usual difference will be found. If, on the other hand, intelligence influences season of conception there will be no difference.

A second line of inquiry is to determine the number of sibs of comparable groups of winter and summer children. Should it be intelligence which influences season of conception, winter children will not only be more intelligent but will have fewer brothers and sisters.

The evidence I have to offer on both these lines is not based on very large numbers, and it is to be hoped that others with more ample material available may be able to put the matter beyond reasonable doubt. Nevertheless, even on the data presented in this paper it is strongly indicated that, unfortunately, the less interesting explanation is the true one. It is the intelligence of the parents which influences the season of conception of the child. Hypotheses of the type almost universally put forward, all depending on the reverse proposition, are, as regards the mass studies at least, inadmissible.

#### The Material

The material is based on a sample of school-children and has already been used for a number of purposes, as described in a series of papers by my colleagues Dr. R. M. Norman and Dr. Ruth Griffiths and myself (1935, 1937, 1938a, 1938b, 1940). Briefly, an attempt was made to secure a representative cross-section of the school-child population by ascertaining, and giving a mental test to, every child whose home was within the boundaries of the City of Bath on July 27, 1934, and whose date of birth fell between Sept. 1, 1921, and Aug. 31, 1925, inclusive. It is believed that ascertainment and testing were in fact almost complete; full particulars are given in the papers quoted. The number of tested children was 3,361.

The sample included a number of sets of sibs, and so provides material for the test mentioned above. Also, in smaller groups chosen from the main group a fuller family study was made. This involved testing all available sibs of school age, and so provides a further sample of sets of sibs. Finally, the number of living full sibs of nearly all the children composing the whole group was determined, so that the second line of inquiry can also be pursued.

#### Results

In the first place, taking the whole sample of 3,361 children, the following figures show that, just as in the studies summarized by Fitt, winter children have a somewhat higher mean performance than summer children. The test used was the advanced Otis; and the index of brightness, or I.B., is centred in 100, with a standard deviation which is about double that of Binet I.Q.

	No.	Mean I.B.
Winter children ..	1,701	100.792
Summer children ..	1,660	99.087
	Difference = 1.705 ± 1.200	

The difference is 1.42 times its standard error. If, however, account is taken of the fact that the deviation is in the expected direction, it just attains the level of significance. There is, of course, some doubt as to where the seasonal limits should be fixed, and with fuller knowledge it would be possible to make more efficient comparisons than that between two six-month periods. It may be worth mentioning that in this sample if February children are transferred from the summer to the winter group the difference becomes significant, even apart from direction.

The whole group included 244 pairs of children born to the same parents, one in each case being a winter child, the other a summer child. This provides 244 differences in Otis I.B.—positive when the winter child is the brighter, and vice versa.

There were 38 sets of three in each of which one child fell into one season and two into the other. Each of these sibships provides two comparisons. It seems reasonable to attach a weight of 1 to each difference between a pair—i.e., a weight of 0.5 per single child. Hence each of the 76 comparisons due to sets of three has been given a weight of 0.75. Similarly, a set of four—three and one respectively falling into the two seasons—provides three comparisons, each with a weight of 0.6. One other set of four—two falling into each season—provides four comparisons, each being allotted a weight of 0.5.

The comparison is thus equivalent to one of 305 pairs of children, each born to the same parents, one member of each being a winter child, the other a summer child. The difference proves to be  $+0.299 \pm 1.820$ . The winter children are still slightly superior, but the difference has been reduced to negligible proportions.

The other sample provides stronger evidence. The cleverest, the median, and the dullest children were chosen for special study, and an attempt was made to test every sib of school age. A group of families of cousins was also tested. The test used was the Stanford-Binet. There is provided in this way a sample of sets of children ranging from one to seven sibs. Unlike the main sample, it is not, of course, either random or representative, but the effect of selection is the same for both winter and summer children. Actually, the mean I.Q. proved to be fairly close to 100.

In the case of 332 children, those born to each pair of parents fell into one season or the other. The result is:

	No.	Mean I.Q.
Winter children ..	172	101.465
Summer children ..	160	97.963
	Difference = 3.502 ± 1.992	

Once again the winter children are superior, the difference being 1.76 times its standard error.

In the sets of sibs which included both winter and summer children the same method of weighting was used as is described above. For example, a set of 7, with 4 falling into one season and 3 into the other, provides 12 comparisons, each being allotted a weight of  $3.5/12$ . There is provided a comparison equivalent to that of 164.5 pairs. The result is  $-1.943 \pm 1.240$ . Thus a large difference, significant if direction is taken into account, is converted into a considerable difference in favour of summer children when sibs born to the same parents are compared. The reversal is significant.

In the main group the number of living full sibs was determined in 3,305 instances. The result is as follows:

	No.	Mean No. of Sibs
Winter children ..	1,676	2.511
Summer children ..	1,629	2.649
	Difference = -0.138 ± 0.076	

The winter children have fewer sibs, the difference being 1.82 times its standard error.

In the whole group winter children differ from summer children by 1.705 points of I.B. This is 0.049 times the standard deviation of I.B. But they differ in number of sibs by 0.063 times the standard deviation of sib-number. Thus while winter children do differ from summer children in intelligence, they differ even more in regard to the lower fertility of their parents. This alone makes it likely that the difference in intelligence

is to be ascribed to a tendency for the time of conception of children to vary at different levels of parental intelligence.

Moreover, there is little doubt that the difference in fertility has been underestimated. The number of living full sibs was ascertained at a time when many of the families were incomplete. Evidence has previously been presented (Roberts, 1939) to show that, when allowance is made for this circumstance, fertility differences are considerably increased.

Taking the evidence as a whole, the results can be said to be significantly against the hypothesis that season of conception influences intelligence, and therefore in favour of the alternative explanation—that intelligence influences season of conception.

### Summary

It is a fact beyond reasonable doubt that children conceived in winter are, on the average, somewhat more intelligent than those conceived in summer. The fact has been almost universally misinterpreted. Practically every hypothesis depends upon the assumption that it is season of conception which influences intelligence, and it has often been urged that planned winter conception would be beneficial. It is shown that if winter children are compared with their summer brothers and sisters the difference vanishes. It is also shown that while winter children differ from summer children in intelligence, they differ even more in having fewer sibs. Thus the observed association is to be ascribed not to seasonal influences on the mother or the developing child, but to a tendency for the children of more intelligent parents to be conceived slightly more often in winter, those of less intelligent parents slightly more often in summer.

### REFERENCES

- Cockayne, E. A., and Penrose, L. S. (1943). *Ohio J. Sci.*, 43.  
Fitt, A. B. (1941). *Seasonal Influence on Growth, Function and Inheritance*, Wellington, New Zealand, and Oxf. Univ. Press, London.  
Huntington, E. (1938). *Season of Birth*, Wiley, New York.  
Hunt, C. A. (1941). *Human Biology*, 13, 378.  
Mills, J. A. F. (1939). *Eugen. Rev.*, 30, 237.  
Roberts, J. A. (1939). *Eugen.*, 10, 293.  
— (1940). *Ann. Eugen.*, 10, 293.  
— and Griffiths, R. (1937). *Ibid.*, 8, 15.  
Norman, R. M., and Griffiths, R. (1935). *Ibid.*, 6, 319.  
— (1938a). *Ibid.*, 8, 178.  
— (1938b). *Ibid.*, 8, 319.

## BACILLARY DYSENTERY IN DUNDEE

### A COMPARATIVE STUDY OF TREATMENTS

BY

W. M. JAMIESON, M.D., D.P.H.

Senior Resident Medical Officer, King's Cross (Infectious Diseases) Hospital, Department of Public Health, Dundee

J. BRODIE, M.D., D.P.H.

AND

D. STIVEN, D.Sc., Ph.D.

Department of Bacteriology, University of St. Andrews Medical School, Dundee

The treatment of bacillary dysentery by sulphaguanidine has opened new fields of investigation. Much of the recent work on this subject has dealt mainly with clinical recovery, but correlation thereof with bacteriological clearance of the stools has received less attention. In this paper are set forth the clinical and bacteriological results obtained in 200 confirmed cases of bacillary dysentery which occurred in Dundee.

Prior to 1941 the criterion for discharge of cases of dysentery from King's Cross (Infectious Diseases) Hospital, Dundee, was purely clinical—i.e., the reversion to normal stools for a period of approximately four days. Late in 1941 examination of faeces in convalescence was undertaken to determine the "convalescent" carrier rate and so find out whether the discharge of patients on clinical evidence alone was possibly contributing to the maintenance of the infection in the community.

The investigation, begun in this way, was extended to a study of the effects of different methods of treatment not only on the course of the disease but also on the incidence of the carrier state in convalescence. The first specimen of faeces in convalescence, irrespective of the treatment adopted, was examined four to six days after the disease had subsided clinically—i.e., at the time when by former standards the

patient would have been discharged from hospital. Thereafter faeces were examined twice weekly until three consecutive negative results were obtained.

The gross figures for bacillary dysentery from 1937 to Aug. 31, 1943, are set forth in Table I.

TABLE I

Year	Notifications	No. Admitted to Hospital	No. Accepted Clinically	No. Confirmed Bacteriologically	Clinical Cases Confirmed Bacteriologically (%)
1937	47	50	23	13	57
1938	325	271	141	45	32
1939	172	169	96	40	42
1940	390	279	183	78	43
1941	420	275	153	73	48
1942	421	322	213	148	69
1943 (8 mths.)	173	130	91	65	71

The table shows that, with the exception of 1939, there was a steady, if slight, increase in the number of notification. There was also a steady rise in the percentage of clinical cases confirmed bacteriologically since 1938. In 1937 the numbers were so small that comparison with 1938-4 cannot be made. This steady rise can be ascribed to improvements in laboratory technique. For about 15 years prior to 1939 faeces were collected in outfits containing Teague's flu (Teague and Clurman, 1916) and plated direct on neutral red agar (MacConkey, 1908). In 1939 Sachs's (1939) modification of Teague's fluid was adopted and MacConkey's agar was modified in that the nutrient basis became serum-peptic-digest lemco broth (Brodie, 1942). Towards the end of 1941 a selective solid medium and a fluid enrichment broth for the isolation of *B. dysenteriae* and pathogenic members of the colon-typho group were elaborated. These consisted of serum-peptic-digest lemco-bile-salt-iron-citrate-rosolic-acid-lactose (C.R.A.) agar at the corresponding C.R.A. broth (Brodie, 1942). The flu medium has since been modified by the omission of the factor but the sugar must not be omitted from the solid medium.

It will be seen that the percentage of bacteriologically confirmed cases rose with these various improvements in laboratory technique. The present investigation covers the whole of 1942 and 1943 up to Aug. 31, and during this period the media employed for isolation were C.R.A. agar and C.R.A. broth.

### Methods of Treatment

The series comprised a total of 200 cases, all confirmed both clinically and bacteriologically. Three types of treatment were adopted, as follows:

(a) *Aperients* (50 Cases).—An initial dose of ol. ricini was given followed by thrice-daily doses of milk of magnesia for children and of sodium sulphate for adults, the dosage being reduced as abnormal constituents disappeared from the stools.

(b) *Sulphaguanidine* (100 Cases).—At first the dosage used was small, being in accordance with that suggested by Anderson and Cruickshank (1941); but both clinical and bacteriological results were disappointing, as no fewer than 12 out of 15 cases so treated yielded positive cultures in convalescence. All 15 cases were infections due to *B. dysenteriae* (Flexner). No further reference is made to these cases. In consequence of this result and because large doses were advocated by Marshall *et al.* (1941), increased dosage based for convenience on age instead of body weight, was instituted (Table II). The tablets were crushed and given in water, the daily dose being divided into four equal six-hourly portions. In all, 11 cases were so treated, and no toxic effects from the drugs were observed.

TABLE II.—Dosage of Sulphaguanidine

Age in Years	Grammes per Day					Total in Gramme
	1st	2nd	3rd	4th	5th	
0-2 .. ..	6	2	2	2	2	14
2-5 .. ..	10	4	4	4	4	26
5-12 .. ..	20	6	6	6	6	44
Over 12 ..	30	8	8	8	8	62

(c) *Chalk Mixture* (50 Cases).—Large doses of sulphaguanidine have a constipating action. It was decided, therefore, to employ the third group a simple remedy—namely, chalk—which would produce a similar effect without exerting the inhibitory qualities of the dysentery bacillus claimed for sulphaguanidine. The amount

of chalk administered for each age group was twice the weight of sulphaguanidine shown in Table II. On several occasions this treatment was supplemented by the oral administration of tinct. opii.

In all groups abundant fluid was given orally, and parenterally when required. There were no special dietary restrictions.

### Clinical Features

Most of the cases occurred in children under the age of 10 years—only 25%, approximately, being over that age. Pyrexia was not a notable feature, and when present it usually subsided within 48 hours of the beginning of treatment. The clinical appearance of the stools varied between loose offensive motions and the typical "pus-blood-and-mucus" dysentery stool. The clinical features are summarized in Table III. No fatal case was encountered in the series.

TABLE III

Type of Treatment	No. of Cases	No. with Pyrexia		Appearance of Stools		
		95-4 F to 100 F	Over 100° F.	Blood and Mucus	Mucus	Loose
Aperients	50	11	9	17	30	1
Sulphaguanidine	100	15	15	44	49	7
Chalk	50	11	7	33	14	3

### Clinical Results of Treatment

Disappearance of mucus from the stool with return to normal consistency was regarded as "clinical cure." The average duration of symptoms after admission is shown in Table IV, the cases being subdivided according to method of treatment and type of infecting organism.

TABLE IV

Type of Treatment		Type of Organism				All Types
		Flexner	Newcastle	Sonne III	Mixed	
Aperients	No. of cases	16	21	11	2	50
	Av. dur. symptoms (days)	6.4	7.0	6.3	4.5	6.5
Sulphaguanidine	No. of cases	51	34	10	5	100
	Av. dur. symptoms (days)	4.8	4.9	4.7	8.0	5.0
Chalk	No. of cases	6	23	18	3	50
	Av. dur. symptoms (days)	4.0	5.3	7.6	6.3	6.0

So far as "clinical cure" was concerned, sulphaguanidine treatment yielded better results than did aperients. In the chalk series duration of symptoms in Flexner and Newcastle infections approximated to the corresponding subdivisions in the sulphaguanidine group, whereas with Sonne III infections sulphaguanidine seemed to give better results. Furthermore, in the sulphaguanidine group the type of infecting organism did not materially alter the duration of symptoms. The mixed infections in each treatment group were too few to allow of comparison.

The incidence of relapse in each group was fairly constant, there being 5 instances in the aperient series, 10 in the sulphaguanidine, and 4 in those treated with chalk.

### Bacteriological Results of Treatment

The bacteriological findings in convalescence are shown in Table V. In this table "negative" means that in convalescence no dysentery bacilli were isolated, while the term "positive" indicates that micro-organisms were recovered from one or more specimens.

TABLE V.—Bacteriological Findings in Convalescence

Type of Treatment		Type of Organism				All Types
		Flexner	Newcastle	Sonne III	Mixed	
Aperients	No. of cases negative	8	10	7	0	25
	% pos. after treatment	8	11	4	2	25
Sulphaguanidine	No. of cases negative	50	52.4	36.4	100	50
	% pos. after treatment	36	26	6	2	70
Chalk	No. of cases negative	15	8	4	3	30
	% pos. after treatment	29.4	23.5	40	60	30
	No. of cases positive	5	12	7	0	24
	% pos. after treatment	16.6	47.8	61.1	100	52

On the whole the group of cases treated with sulphaguanidine gave better results than did either of the other groups, although treatment of Sonne III infections with aperients was slightly better than with sulphaguanidine. The low percentage of positive cases in convalescence in the chalk-treated Flexner group cannot be considered a fair comparison owing to the small number of such cases in the series.

The isolation of *B. dysenteriae*, using the media herein described, can be obtained either by direct plating on C.R.A. agar or by subculture following enrichment in C.R.A. broth. An analysis of the isolations obtained by plating compared with those obtained only after enrichment is interesting, and is shown in Table VI.

TABLE VI.—Analysis of Isolations

	Aperients	Sulphaguanidine	Chalk	All Types
No. of diagnostic specimens positive by direct plating	33	70	33	136
No. of diagnostic specimens positive after enrichment only	8	21	12	41
No. of convalescent specimens positive by direct plating	29	24	35	88
No. of convalescent specimens positive after enrichment only	11	21	18	50

It will be noted that there is an apparent discrepancy between the number of positive diagnostic specimens and the total number of cases. This is due to the fact that in 23 cases the infecting organism was isolated only during convalescence. These specimens were therefore considered as convalescent specimens.

The results in Table VI show that the employment of the enrichment technique is amply justified and that direct plating, used alone, can yield a false sense of security as regards freedom from infection. Particularly is this so in convalescence, where no less than 36% of the positive results were obtained only by the enrichment method. Moreover, a number of cases included in this investigation would not have been confirmed bacteriologically and a further number would have been discharged prematurely had not the enrichment technique been employed. These are set out in Table VII.

TABLE VII

	Type of Treatment			Total
	Aperients	Sulphaguanidine	Chalk	
No. of cases with specimens positive at all stages, but by enrichment only	9	18	7	34
No. of cases in convalescence with all positive results obtained only by enrichment	6	11	3	20

It might be thought that laboratory technique would have no great bearing on the management of cases, but, as will be seen in Table VII, the greatest number of convalescent cases which yielded positive results by enrichment alone fell to the sulphaguanidine group. Moreover, Table VI shows that of a total of 45 positive specimens during convalescence in the sulphaguanidine group, 21 would have yielded false negative findings had enrichment not been used.

The convalescent carrier rate in the sulphaguanidine series, then, is lower than in the other two, but the difference would have been even more striking had only direct plating been employed: for without enrichment the percentage of cases positive after sulphaguanidine would have fallen from 30 to 19%, as compared with from 50 to 38% and from 52 to 46% after aperients and chalk respectively. Furthermore, a certain number of cases which were positive in convalescence by direct plating yielded subsequent positive specimens by enrichment only, therefore prolonging their stay in hospital. Because of this, in 19 cases in the sulphaguanidine group an average of 9.9 days per case was added, while in the aperient group 9 cases were similarly delayed for an average of 7.6 days and in the chalk group 9 cases for 5.5 days.

It may be that the explanation of this prolongation of the "convalescent" carrier rate, particularly in the sulphaguanidine



group, is due to the small number of dysentery bacilli in the faeces—small because of the inhibitory action of sulphaguanidine on the micro-organisms. This will have a direct effect on isolation of the micro-organisms, since if their number be small, so will the possibility of isolation by direct plating be small, whereas "enrichment" in C.R.A. broth followed by plating on C.R.A. agar will enhance the chance of their isolation.

In the aperient group the delay was less than in the sulphaguanidine group but greater than in the chalk. Here the bacilli are washed out of the gut mechanically by purgation, but, since no inhibitory effect is present, propagation of the remaining bacilli can continue unimpeded. Under such conditions direct plating should give more satisfactory results, and so "enrichment" could be expected to exercise less effect in delaying the discharge of convalescent cases from hospital.

Since chalk has a purely mechanical action in producing constipation, the organisms are more likely to be present in larger numbers in the gut, and so direct plating might be expected to give the optimum number of isolations, making the enrichment technique less necessary, and therefore less apt to prolong the "convalescent" carrier rate.

Whether or not the above explanations are correct, the results obtained do indicate the necessity for exercising great care in the handling of faeces from convalescent cases, especially where drugs possessed of properties inhibitory to the dysentery bacilli are employed in treatment.

#### In Vitro Experiments with Sulphaguanidine

Marshall *et al.* (1940) claim that sulphaguanidine *in vitro* possesses inhibitory, bacteriostatic, or bactericidal effects on the micro-organisms of the dysentery group. The optimum temperature for these effects varies from 39° C. to 41° C., and these temperatures are worthy of note, since their occurrence *in vivo* depends upon the clinical severity of the cases. In the 100 cases surveyed only 30 were pyrexial, and of these 4 had a temperature over 39° C. In view of the claims of Marshall *et al.*, these pyrexial cases treated with sulphaguanidine in sufficient quantity to produce saturation of the gut contents should show the maximum benefit from treatment.

The *in vitro* experiments were designedly performed at 37° C. because of the preponderance of apyrexial infections encountered among the cases discussed. Six smooth and recently isolated organisms were employed—namely, *B. typhosus*, *B. paratyphosus* B, *B. dysenteriae* (Shiga), *B. dysenteriae* (Flexner W), *B. sonnei* III, *B. dysenteriae* var. Newcastle. All were grown for 24 hours in 1% peptone water before subculture into media containing sulphaguanidine. Two loopfuls (1/8 in. diameter) of this growth were used in each instance to inoculate agar slopes, semi-solid agars, and broths, all made according to the method of Hinton (1918), enough sulphaguanidine having been added to the media to ensure saturation at 37° C., and all tubes being incubated at that temperature after addition of the drug and before inoculation. Subcultures were made at intervals of 24, 48, 72, and 96 hours into 1% peptone water. Visible growth was not accepted unless all subcultures were checked by fermentation and serological tests. In no instance was a bactericidal action revealed on the solid medium, although a bacteriostatic effect was obtained with *B. dysenteriae* (Shiga), but subcultures even in this instance yielded good growths. All the other micro-organisms tested were inhibited, but bacteriostasis was not complete or even striking.

*In vitro* experiments at temperatures higher than 37° C. were not performed, but the possible effect of pyrexia on the course of the illness is indicated in Table VIII.

TABLE VIII.—Pyrexia in Sulphaguanidine Group

Bacteriological Findings in Convalescence	Normal Temp.	Degree of Pyrexia		
		Normal to 38° C.	38° C. to 39° C.	Over 39° C.
No. of cases negative ..	49	11	7	3
" " positive ..	21	6	2	1
Total ..	70	17	9	4

It would seem, therefore, that the occurrence of pyrexia in sulphaguanidine-treated cases has no marked influence on the bacteriological results in convalescence. It is interesting, however, to contrast the pyrexial with the apyrexial cases in respect of average duration of symptoms following treatment. The average duration in the 30 pyrexial cases was 4.6 days, as compared with 5.2 days for the 70 apyrexial cases. This would suggest that sulphaguanidine is somewhat better in respect of clinical recovery in the more acute type of case. During the period covered by this investigation 5 cases of chronic bacillary dysentery have been treated at varying times with full courses of sulphaguanidine (Table II). In none of these has any improvement in the clinical—or bacteriological—condition been observed following such treatment.

#### Estimation of Sulphaguanidine

When using sulphaguanidine it is essential to oversaturate the gut contents with the drug. The solubility of sulphaguanidine at body temperature is approximately 200 mg. per 100 c.cm.; therefore the presence of more than this amount can be taken as evidence that saturation has been achieved. Two patients in each age group were investigated as to the amount of free sulphaguanidine in their stools at 24-hour intervals after starting treatment. The method of estimation was that recommended by Bratton and Marshall (1939). The results are shown in Table IX.

As a matter of interest a few urines were also examined for their free sulphaguanidine content per 100 c.cm., and these results are entered in parentheses in their appropriate places in the table. From the figures obtained it is apparent that, despite the claim that sulphaguanidine is not absorbed from the gut to any great extent, an appreciable amount can be demonstrated in the urine.

TABLE IX.—Concentration of Free Sulphaguanidine in Faeces (mg. per 100 g.)

Age Groups (years)		Time of Sampling after starting Treatment				
		24 hrs.	48 hrs.	72 hrs.	96 hrs.	120 hrs.
0-2	Case 1	4,430	456*	1,970	1,450	1,260
	" 2	688*	535*	892	621	876
2-5	" 3	5,450	5,165	6,700	4,274	1,587
	" 4	838	6,180	866*	1,560 (100)	1,493 (93)
5-12	" 5	4,710	6,350	4,388	2,038 (133)	1,877 (154)
	" 6	2,320	3,630	2,720	3,780 (29)	2,255 (58)
Over 12	" 7	13,300	5,430	7,190	4,430	No specimen
	" 8	10,800	3,030	2,850	1,965	1,240

\* Fluid stool.

It is evident from the results in Table IX that the dosage adopted, based on age in place of body weight, besides being more practicable, is also quite adequate to oversaturate the gut contents.

#### Conclusions

The use of sulphaguanidine in bacillary dysentery gives results superior, both clinically and bacteriologically, to those from aperients and chalk, but, even so, 30% of cases are still bacteriologically positive in convalescence, as compared with 50% with the other treatments.

Pyrexia does not appear to influence the effect of sulphaguanidine to any great extent.

The use of the C.R.A. broth-enrichment technique reveals many positive results, particularly in convalescence and in cases treated with sulphaguanidine, which would be missed if direct plating only were employed.

We wish to thank Prof. W. J. Tulloch and Dr. W. L. Burgess for facilities granted in the preparation of this paper.

#### REFERENCES

- Anderson, D. E. W., and Cruickshank, R. (1941). *British Medical Journal* 2, 497.  
 Bratton, A. C., and Marshall, E. K. (1939). *J. biol. Chem.*, 128, 537.  
 Brodie, J. (1942). *J. Path. Bact.*, 54, 499.  
 Hinton, F. M. (1918). *J. Infect. Dis.*, 23, 169.  
 MacConkey, A. T. (1908). *J. Hyg., Camb.*, 8, 322.  
 Marshall, E. K., Bratton, A. C., Edwards, L. B., and Walker, E. (1941). *Johns Hopk. Hosp. Bull.*, 68, 94.  
 ———, White, H. J., and Litchfield, J. T. (1940). *Ibid.*, 67, 163.  
 Sachs, A. (1939). *J. R.A.M.C.*, 73, 235.  
 Teague, O., and Clurman, A. W. (1916). *J. Infect. Dis.*, 18, 653.

## MENINGOCOCCAL JAUNDICE

BY

CHARLES CRAWFORD, M.R.C.S., L.R.C.P.

Capt., R.A.M.C.; Attached to a Military Hospital

Simple infective hepatitis becomes a common disease in war-time, and the other diseases giving rise to jaundice are infrequently met with in healthy young soldiers, so that the occurrence of one of the rarer causes may be worth recording. This case had jaundice as the unusual presenting symptom of a severe acute meningococcal septicaemia, and it is of interest, first, because there were never any symptoms of meningeal involvement, and, secondly, because it was not until the patient was well on the way to recovery, as a result of empirical treatment, that a final diagnosis was made.

## Case History

The patient, a soldier aged 23, was admitted to hospital on the second day of an illness which started after an inoculation of T.A.B. and tetanus toxoid. Previously he had been quite well. Five hours after the injection, after dinner, he began to shiver and feel sick, vomiting several times during that and the following day, and twice bringing up fairly copious streaks of blood. Twenty-four hours after the onset he noticed that his urine was dark, and at this juncture he was admitted to hospital.

Physical examination gave one the general impression of a not very ill man. His conjunctivae and skin were moderately jaundiced, and the tongue was furred, the liver was enlarged to two finger-breadths below the costal margin and was tender, and the spleen was not palpable. His temperature was 98°. The urine contained bile and a moderate amount of albumin, and a diagnosis was made of simple infective hepatitis, with symptoms accentuated by the T.A.B. inoculation. He denied having had any arsenical injections, although he had had gonorrhoea. Next day, however, his temperature had risen to 103°, severe frontal headache was present, and a rash had appeared, at first red and macular in character and confined to the trunk, and later becoming purpuric. Neck rigidity was absent and Kernig's sign was negative. A blood count showed 3,620,000 red and 18,700 white cells. He had vomited only once since admission and was taking fluids well; but, although he was rational, he was obviously more ill than would be accounted for by a simple infective hepatitis, so a tentative diagnosis of Weil's disease was made.

None of us had seen a case of Weil's disease, but a leucocytosis of 18,700 eliminated infective hepatitis and the enteric group, and the general picture of jaundice, pyrexia, purpuric rash, and albuminuria made the diagnosis probable, although the two signs stressed in the textbooks—muscular pains and suffusion of the eyes—were absent. Any pneumonic condition was ruled out by physical examination and radiographs of his chest, and the only factor difficult to account for was the speed at which jaundice had appeared, there being practically no prodromal phase; but this we explained by the exaggerating effect of the T.A.B. Further questioning showed that exposure to rats was possible. He had been in Kent for two months before the illness, and had slept under canvas, but he denied bathing in or drinking from unauthorized water sources, and his only wet job had been potato-peeling. He had, however, seen several rat-holes in the vicinity of the tents, and heard rats about at night.

So although the diagnosis rested on rather slender evidence, it was the best we had to go on; culture of the T.A.B. and T.T. had proved sterile, and none of the other men inoculated from the same bottles at the same time had had any unusual symptoms. Accordingly, blood was taken for culture and for guinea-pig inoculation, and he was given daily 60 c.cm. of antileptospiral serum, urgently obtained by dispatch rider. Ample fluids were given by mouth, together with 300 g. of glucose and 150 units of insulin, as well as 1 g. of calcium gluconate daily, to minimize liver damage. There was only enough serum for three days' treatment, but by the end of that time, instead of improving, his condition had deteriorated, the temperature being irregular, and varying between 98° and 104°, the rash spreading over his limbs and face, and his skin assuming a greenish tinge, although, apart from severe frontal headache, he did not appear to feel very ill. There was still no neck rigidity or positive Kernig's sign, and blood taken three days before, on the third day of illness, was sterile on culture. His blood showed no agglutination to leptospiral serum, so our hopes turned on the fate of the guinea-pig. By the end of ten days, however, the patient was still extremely ill and severely jaundiced, although the rash had faded a little, and his temperature was swinging considerably; so, to shake our diagnosis further, the guinea-pig, which by this time should have been moribund, was thriving with no untoward symptoms.

A consultation was held to decide on further action, as it was now clear that our diagnosis was wrong, and that he was not

responding to treatment. Blood was again taken for culture, and a count showed 3,620,000 red and 22,400 white cells. As a last resort, and against all best principles in an undiagnosed case, it was decided to try the effect of one of the sulphonamide drugs. We gave him sulphathiazole and, lest we should further damage the liver, only a moderate dose was used—1 g. four-hourly, after an initial 2 g. The result was dramatic (see temperature chart). Within 24 hours his

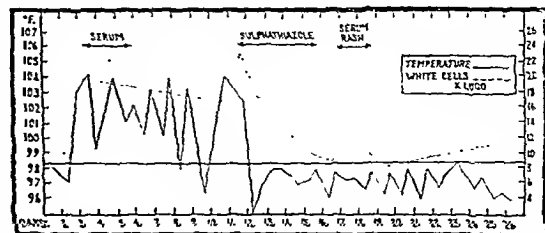


Chart of the case, showing temperature and white cell counts.

temperature dropped to 95°, and never rose above normal again; he was feeling better, and for the first time since admission asked for something to eat. A day later the jaundice was fading and his urine was free from bile.

It was not until this stage that the thought of some common septicaemic condition was seriously entertained. The swinging temperature, the purpuric rash, the albuminuria, the liver damage, and the leucocytosis all fitted in, but the degree of jaundice was an outstanding difficulty. Apart from this, the fact that the organism had not so far been cultured, and the dramatic response to chemotherapy, suggested the meningococcus as a possible causative organism, as it is notoriously difficult to grow. Finally, on the next day our minds were set at rest, and the diagnosis was finally established by a telephone message from the pathologist reporting the growth of a Type 1 meningococcus after seven days' culture.

Altogether the patient had 28 g. of sulphathiazole over four days, and once his temperature had resolved his jaundice cleared quickly, his appetite returned to such a degree as to make up for the two-weeks lack of solid food, and, apart from a severe serum reaction with urticaria of his skin and mild oedema of the glottis ten days after the antileptospiral serum, and a mild relapse of the jaundice two weeks after the resolution of his temperature, he made a complete recovery.

## Discussion

There are several points of interest in this case—first we have the severity of the jaundice and its early appearance, within 24 hours of the onset. It must be exceedingly rare, apart from Weil's disease and yellow fever, to encounter severe jaundice and prolonged high fever in a patient who has not some obvious reason for his liver damage, such as portal pyaemia or suppurative cholangitis. The localization of the infection to the liver is also noteworthy, in view of the complete absence of meningeal involvement even after ten days' septicaemia.

As for our lateness in forming a diagnosis, the jaundice was the red herring, without which we should probably have been on the right track much earlier. The high fever, the leucocytosis, and the purpuric rash would have helped but for the fact that they also fitted the descriptions of Weil's disease; and at the time, before the bacteriological reports were returned, everything was in favour of this diagnosis, except for the absence of suffusion of the eyes and the muscular pains, which are always present and are often agonizing. These two signs we later learned to be almost constant findings.

Last of all, the improvement of the condition so soon after sulphathiazole had been started made us a little doubtful whether the drug was the curative agent or whether we were witnessing the natural history of the disease; but although the patient's temperature had returned to normal within 18 hours of starting the drug—i.e., after only 8 g. had been given—the permanence of its effect and the final isolation of the organism made its curative action a certainty.

## Summary

A case of meningococcal septicaemia is described in which the presenting symptom was severe jaundice—the meninges escaping infection—and in which at first a mistaken diagnosis of Weil's disease was made. Cure of the condition was dramatic, and resulted from the use of sulphathiazole.

My thanks are due to Lieut.-Col. E. Bulmer for his advice in publishing this article.

## Medical Memoranda

### Staphylococcal Septicaemia treated with Penicillin

The following record of a case of septicaemia which responded to treatment with penicillin may be of interest.

#### CASE HISTORY

The patient, a lance-corporal aged 21, had been treated for sinusitis two months before the present illness, and had had several examinations on account of chronic cough; these were Tb-negative. Two weeks before admission to hospital he had had a boil on the neck, which healed on being opened and drained. Five days before admission he reported sick with acute pain over the right sacro-iliac region. There were no other symptoms, and no pyrexia. He was treated at home with local heat. An unusual feature was the extreme tenderness. Just before admission to hospital his temperature was 102° and the pulse 107. There was oedema of the right buttock and slight diarrhoea.

On Nov. 22, 1943, at 6 p.m., the patient was admitted to the Royal Hospital, Richmond. His temperature was then 103° and the pulse 120, and he complained of severe pain in the right buttock and the right shoulder. Aspiration of the buttock yielded a few cubic centimetres of thick pus, which proved to contain *Staph. aureus*. Sulphathiazole 2 g. was given three-hourly for 3 doses, followed by 1 g. four-hourly. Culture of blood collected at 5 p.m. on the next day gave a heavy growth of *Staph. aureus*.

On Nov. 23 deep abscesses of the buttock and the supra-acromial region were opened and drained. The patient's temperature was still raised and his general condition poor. Sulphathiazole administration was continued until 2 a.m. on the 24th. The concentration of drug in the blood was very low (between 1 and 3.5 mg. per 100 ml.). The white cells numbered 25,000 per c.mm.

At 10 p.m. on Nov. 24 treatment with penicillin started with intravenous injections of 15,000 units (2.5 c.c.m.) three-hourly. The white cells were reduced to 17,600 per c.mm. On Nov. 25 the temperature was still swinging between 100 and 103°. His general condition, however, had slightly improved, with 14,000 white cells per c.mm. and 70% haemoglobin. A transfusion of one pint of stored blood was given on Nov. 26. The abscesses continued to drain, and the patient's condition was slightly better.

On Nov. 27, at 10 p.m., penicillin was discontinued after a total dose of 360,000 units had been given. On the 29th blood culture was sterile, and next day the temperature was normal. Further progress was uneventful. At the patient's discharge on Dec. 20 his general condition was good and the abscesses had healed.

All laboratory investigations were carried out by Miss Sheila Newstead, M.R.C.P.

TEODORO SCHLOSSBERG, M.D.,

British Council Scholar;

Assistant Professor of Gynaecology, University of Buenos Aires.

### Rupture of the Rectus Abdominis Muscle during Pregnancy

In the *Journal* of July 31, 1943 (p. 136) there is an account by Rufus C. Thomas of a case of rupture of the rectus abdominis muscle during pregnancy. As I had such a case in 1937 I send a short account, since I feel that the rarity of this misadventure warrants publication.

The patient was a woman 30 years of age who was at term with her sixth pregnancy. Her obstetric history was entirely satisfactory, and the existing pregnancy had been attended by no untoward circumstance. She was admitted to the Duncedin Hospital on Aug. 16, 1937, complaining of spasms of epigastric pain for the preceding 24 hours, which had been replaced by a constant pain on the left side of the abdomen that was aggravated by movement. The pains did not resemble labour pains. She had suffered from a cold for about three weeks and severe cough with vomiting for three days before admission.

On examination she appeared to be a healthy obese woman with no signs of constitutional disease. Abdominal examination, hindered by a heavy overburden of fat, revealed two tumours of approximately equal size and symmetrically occupying the right and left halves of the abdomen from the pubes to the costal margins. That of the right was the uterus containing a foetus at term in the R.O.A. position and alive with satisfactory heart sounds. The left tumour was diagnosed as an ovarian cyst which had either rotated its pedicle or into which a haemorrhage had occurred; a definite fluid thrill was elicited. This seemed a reasonable diagnosis, although it may possibly have been influenced by the fact that a pregnancy with a large ovarian cyst had been dealt with in the hospital a few weeks previously.

The abdomen was opened in the midline below the umbilicus. The left-hand tumour was found to be a very large haematoma between the peritoneum and the anterior abdominal wall. It was as big as the pregnant uterus, which was displaced to the right. Fortunately the incision just missed opening the haematoma, which was left alone. The foetus was delivered by a classical Caesarean section in a state of asphyxia livida, from which it rapidly recovered. Convalescence was quite satisfactory, and 14 days after the operation the haematoma could still be palpated, but it gradually and completely absorbed.

This case was one of rupture of the left rectus abdominis muscle as the result of coughing and vomiting, but it differed from most of the reported cases in that there was at no time any anxiety about the patient. There were no signs of secondary anaemia in spite of the size of the haematoma: on admission the patient's temperature was 98° and her pulse 100. The operation, performed under gas-oxygen anaesthesia, was uneventful and the child robust and healthy.

In 1939, two years later, another pregnancy occurred, which proceeded to uneventful delivery at term after the appearance of mild toxæmic symptoms during the 40th week.

J. B. DAWSON, M.D., F.R.C.S., F.R.C.O.G.,

Professor of Obstetrics and Gynaecology,  
University of Otago, New Zealand.

### Actinomycosis treated with Sulphapyridine

The following is the history of another case cured, apparently with sulphapyridine.

#### CASE RECORD

In March, 1942, a farm labourer aged 20, a particularly healthy individual, developed a swelling in the left masseteric region on the cheek which spread through the substance of the cheek to the lower alveolus in the region of the second premolar and first molar teeth. The diagnosis of actinomycosis was proved beyond doubt by recovering the organism from a little pus obtained from a small incision in the cheek. Radiographs confirmed the fact that the bone (mandible) was involved.

Treatment with Lugol's iodine, on the advice of Prof. Grey Turner after being kindly approached on the subject by Mr. Eric Young was started in March, 1942, and was continued in increasing and heroic doses to May, 1942. As the swelling did not subside he had a course of x-ray therapy in June and July, 1942; but his condition continued to deteriorate, and the x-ray therapist finally stated that it could not be overcome by x-radiation, and advised surgical measures. By this time the patient could barely open his mouth, and the swelling was very large externally, with two discharging sinuses above the angle of the left mandible.

Before resorting to surgery, however, it was decided to try the effect of Lugol's iodine again, and he continued to take this from Aug., 1942, to Aug., 1943. While on the iodine his swelling greatly subsided and he was much more comfortable, the impression being that the condition was kept under control but not cured. On two occasions he developed symptoms of iodism, and the drug had to be stopped temporarily. The iodism rapidly cleared up, but the swelling developed again in an alarming fashion each time, with recurrence of discharge from the sinuses. Even while on the iodine he would have periods of a few days when one of his sinuses would discharge a little. It therefore became obvious that complete cure could not be expected from iodine.

In the *British Medical Journal* of July 24, 1943 (p. 106), I read a report by Dr. A. McCloy of a case cured by sulphapyridine. Now during the interval between the employment of x rays and starting iodine again I had experimented with sulphapyridine, using the heavy dosage given for severe infections, and with no apparent response. I observed, however, that Dr. McCloy had used a rather different method of administration. His scheme of dosage was:

2 tablets four times a day for four days.  
No tablets for four days.  
2 tablets four times a day for four days.  
No tablets for four days.  
2 tablets four times a day for four days.

This scheme was therefore adopted in this case, and met with a triumphant success. Treatment was started on Aug. 11, and finished on Aug. 30, by which time all swelling had gone and he could open his mouth naturally. He has had no recurrence of swelling since then.

Perhaps it may be said that it is too early to count on a definite cure, but I feel the case ought to be reported in order to establish the effectiveness of Dr. McCloy's scheme of treatment. It seems that the method of administration is important in this disease and that cure can be obtained if the correct dosage is given. Evidently for a chronic infection of this type it is necessary to give, not a high dosage over a short period but a smaller dosage over a prolonged period.

In the Medical Research Council's War Memorandum No. 11—*The Medical Use of Sulphonamides*—the following statement appears at page 33: "Actinomycosis cases have been reported which apparently responded rapidly to sulphonamide therapy. . . . Other observers have failed to confirm this response, and they prefer treatment with potassium iodide and x rays. Further experience would be valuable. If sulphonamides are used, large doses of sulphathiazole or sulphapyridine should be given, for a severe infection."

If any apology is needed for reporting this case so fully, I feel the answer lies in the fact that this gives a little more experience, and negatives the suggested dosage given by the

I would like to thank Mr. Eric Young, Dr. C. Bellamy, and Prof. G. Turner for their kind help in this case.

Leck, Staffs.

R. W. BILLINGTON, M.B.

## Reviews

### BRITISH WAR SURGERY

*Surgery of Modern Warfare*. Edited by Hamilton Bailey, F.R.C.S. Sub-editor for Medicine, C. Allan Birch, M.D., M.R.C.P. Compiled by 76 contributors. Parts I and II, third edition (complete in 2 parts). (Pp. 321; illustrated, 15s. each part, plus 6d. postage.) Edinburgh: L. and S. Livingstone, 1944.

The early appearance of a third edition of this work is an indication of its popularity and its importance. We learn that the whole of the second edition was bought up by one of our Allies, whose discernment is commendable. Those practising war surgery will undoubtedly find this the most comprehensive and authoritative work on their subject which has appeared since the outbreak of the present carnage. The third edition of it is being produced in six parts, the first two of which are now to hand. These show evidence of a thorough revision of the earlier texts in order to incorporate recent experiences and discard the redundant or obsolete.

Parts I and II deal with war wounds, the manner of their infliction, their classification, bacteriology, and treatment, and such questions as resuscitation, transfusion, anaesthesia, and surgical materials and dressings. Among many well-known contributors we find the names of the professors of either general or special surgery in six of our universities, as well as those of consultants to the Forces and of many serving medical officers in all three fighting Services and in the Emergency Medical Service. This book may therefore be said to be widely representative of British surgery, and particularly British war surgery. With each edition it becomes more valuable, not only as a guide to the inexperienced in war surgery but as a record of what has proved valuable in its practice, and in this respect it must to some extent constitute a surgical history of the present war. In the third edition the defects of the first have been almost eliminated. When the first edition appeared many of the contributors had had little experience of the wounds and problems of blitzkrieg and all that it implies; as might have been expected, therefore, some articles were reminiscent of the 1914-18 war. Every war, however, is a new experiment, and it was not long before we all found that the present one was no exception, and that many ideas and practices had to be changed, in some instances radically. The book is essentially practical, attractive in appearance, and lavishly and well illustrated. For it we have the highest commendation.

### COWS' MILK

*This Milk Business: A Study from 1895 to 1941*. By Arthur Guy Enock. (Pp. 292; illustrated, 18s.) London: H. K. Lewis and Co. 1943.

The title of Mr. Arthur G. Enock's book, *This Milk Business*, is well chosen, affording as it does some indication of the wide field of interests over which the author ranges. As would be expected of a consultant dairy engineer who has spent much of his time on the technical aspects of milk processing, he deals mainly with the distributive side of the milk trade. The producer's side is not forgotten; indeed, one of the suggestions made for the improvement of our present supply is to set a bacteriological standard for all milk received from the farm. One of the fullest sections concerns the heat treatment of milk. The author is not content to give a simple description of the methods now available. He criticizes the high-temperature short-time method roundly, and points out that the existing requirements are quite insufficient to ensure that all the milk passing through the plant is adequately heated. This statement is supported by a record of personal observations. On the other hand, he makes a strong plea for the in-bottle system of pasteurization—a plea that will receive the cordial support of public health workers. The phosphatase test comes in for quite unmerited abuse. Admitted that, like all other tests, it has its weaknesses, it is nevertheless calculated to be of great service to the cause of pasteurization. We hope that the author will see fit to revise his views, or else support his objections by the test by more solid evidence than that which he adduces here. In the future organization of the milk industry the establishment of a national milk control board is recommended, whose

purpose it would be "to ensure the supply to consumers of clean milk, free from disease, of full nutritional character, and of a quality which will keep sweet for at least two days in summer weather." This is an ideal worth aiming at, and nothing short of a unifying body commanding the interests and services of all branches of the industry is likely to achieve it.

There is much more in this book than can be touched on in this brief notice; and all those who enjoy looking at a subject from the point of view of an individualist will gain both pleasure and profit from its perusal.

### "DAMAGED GOODS"

*Damaged Goods (Les Avariés)*. A play by Eugène Brieux. New English version by Sir John Pollock, Bt. (Pp. 64. 2s. 6d.) London: Jonathan Cape.

The play entitled *Les Avariés*, by Eugène Brieux, was first produced in France in 1902. Banned by the Censor, it made a deep impression on Paris intellectuals; the ban was removed and the play achieved a triumph. Sir John Pollock translated it into English and got it published in 1911. It was produced at the Little Theatre in February, 1914, but came under the Censor's ban until 1917, when J. B. Fagan produced it at the St. Martin's Theatre, where it ran for nearly a year; touring companies carried it all over the country. It was revived at the Whitehall Theatre in the latter part of 1943, the new version having been slightly altered by the translator in order to bring it up to date.

The policy of Brieux was undoubtedly to show up social abuses fearlessly, but it needed courage of a very high order to mention "the most unmentionable of all subjects" (to quote Mr. Bernard Shaw). In the early years of this century the subject of venereal disease was completely taboo in polite society, and the public ignorance of it abysmal; the disease was regarded as the wrath of God descending on man for his sins; yet the play was a success in France from the start. When translated into English it produced the same reactions: the Censor banned it and "high life" regarded it as a lecture or a tract, but the public realized its drama, its humanity, and its educational value. They wanted to know more about the "unmentionable disease," and they want to now.

There can be little doubt that *Damaged Goods* plays, and will continue to play, an important part in the campaign against V.D., mainly because it is outspoken—it shows what syphilis is, how it may be acquired, and how it may affect the unborn child. This play is essentially an indictment of ignorance; it is drama at its best, and as such appeals to the ordinary man and woman.

### Notes on Books

It may be well to recall that the Charity Organization Society consists of a federation of district committees within the London area, whose general principles of action are determined by a central Council. The primary object of the society is to give a definite aim to, and to direct into the most effectual channels, the large amount of benevolent force at work in England, and particularly in London. One of its undertakings is the compilation of an *Annual Charities Register and Digest*, of which the 51st edition, for 1944, has now been published by Longmans, Green and Co. This is a most useful reference book, giving information about the societies, associations, and other bodies that provide relief in affliction and distress of all kinds. There are 43 sections and a full index. Copies can be had from the C.O.S., Denison House, 296, Vauxhall Bridge Road, S.W., or from the publishers, price 10s. 6d.

*Whitaker's Almanack* for 1944 has now been published from 13, Bedford Square, London, W.C.1. The usual three editions will be available—the complete edition, cloth bound, with 1,024 pages at 10s.; the shorter edition, paper bound, with 724 pages at 6s.; and the library edition, with a section of coloured maps, bound in leather, at 21s. Urgent Government demands on printers and binders delayed publication, and the editor in his preface finds occasion once more to note the increase in the space occupied by details of Government and Public Offices. The *Diary of the War* records the achievements of the United Nations, and various statistical tables of post-war reconstructional interest have been added. The general index runs to 72 pages.

## Preparations and Appliances

### THE ST. MARK'S X-RAY ANTI-INCONTINENCE DEVICE

Dr. NORMAN P. HENDERSON, D.M.R.E., radiologist to St. Mark's Hospital, writes:

Between the years 1929 and 1930, while searching for the best method of carrying out the combined air-inflation technique in the x-ray examination of the colon, the following device was made to my design, and at that time was manufactured for me by Allen and Hanburys, Ltd., London, W.1. Essentially it comprises a double rubber bag or "balloon" which can be inflated with air by means of the small tube fixed to the lower and back part of the rubber device (Fig. 1). Through the centre of this "balloon" a circular channel has been moulded sufficient to permit the passage of a rubber catheter, and in this connexion one of the self-retaining variety is advocated, such as the de Pezzet, size 28 or 30.

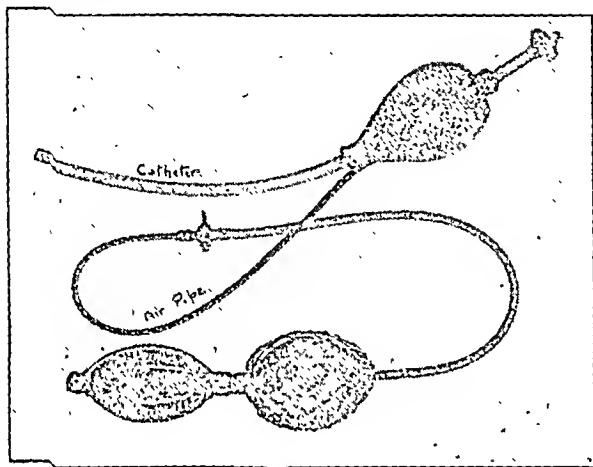


FIG. 1.—The rubber device complete with catheter and air bellows.

The catheter is passed through the central channel of the rubber bag, and the appliance is now ready for insertion into the rectum. To facilitate passage of the catheter head through the proctoscope the head can be elongated by extending it in

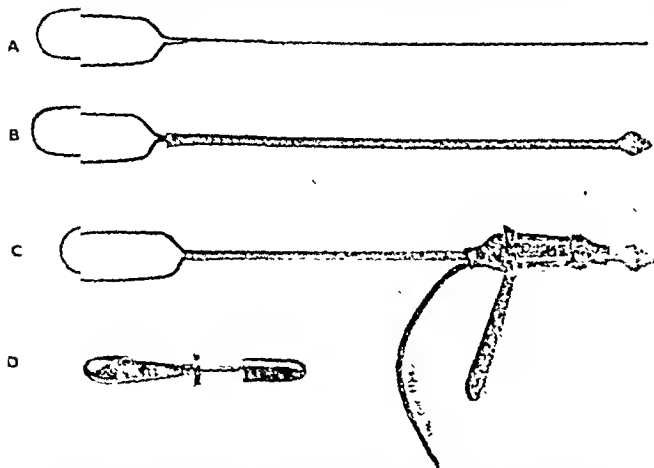


FIG. 2.—A, Stylet for de Pezzet catheter. B, Catheter with stylet inserted. C, Stylet, catheter, and rubber "balloon" passing through the proctoscope. D, The proctoscope obturator removed.

the usual way by inserting the metal stylet supplied for this purpose. Next the air is expelled from the rubber "balloon" by collapsing the bag between the fingers, and the whole (catheter and "balloon") lightly lubricated with some sterile lubricant, preferably not vaseline, as the latter tends quickly to perish rubber. Now pass the collapsed "balloon" and catheter through a large-size proctoscope which has been

inserted into the patient's anus and gently push the device in the rectum. Finally remove the stylet and proctoscope. The rubber bag is now gently inflated by means of the small bellows until the pressure on the bellows taps just becomes resistant to light pressure between the finger and thumb (approximately 25 mm. of mercury). This is found to be sufficient to keep the device securely in the rectum, with the minimum of discomfort to the patient, and to prevent the average patient expelling it or allowing any of the enema to return outside the rectum. To make sure no air escapes from the "balloon," it has been found from experience that the best device for clamping the rubber air pipe end is an old pair of Spencer Wells forceps. The usual vulcanite taps supplied to instrument makers invariably leak and consequently the air pressure in the "balloon" collapses. If desired, a manometer can be inserted in the air pipe through a "T" piece to act as a guide for the beginner and so register the actual pressure within the "balloon" now lying in the rectum. This, however, can usually soon be discarded after a short experience in the use of the device. Patients with badly torn perineums or severe sphincter paralysis may require additional pressure by application of a wad of cotton-wool twisted round the catheter and pressed over the perineum. Should difficulty still be experienced, the special accessory compression tray (Fig. 3).

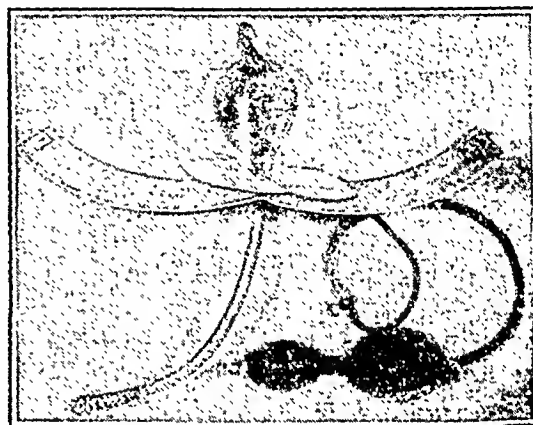


FIG. 3.—Special accessory compression tray. Note slots at either end of tray for fitting abdominal bandage strap.

can be slipped up over the catheter and adjusted in position externally over the perineum and held there by two bandage straps which pass around the abdomen. This additional pressure tends to check further expulsion of the device until the enema is administered. The accessory compression tray is only rarely required, and in the average case of bowel incontinence the use of the rubber device alone has been found to work perfectly. As the appliance really acts as a rubber air cushion within the rectum there is no danger to the rectal walls themselves.

A miniature "balloon" measuring 1 in. in length has been found equally useful for washing out, or filling, either limb of the colostomy. It works on the same principle as the larger device for rectal insertion, a child's catheter being used instead of the adult sizes.

During the past 14 years this appliance has been in active use, and so far no failures in its application have been recorded. It would appear to be invaluable to the medical practitioner or exasperated nurse for washing out colons in these difficult cases, and to the radiologist for the successful carrying out of the opaque enema on the incontinent patient, being specially recommended for the combined air-inflation enema cases that cannot retain the air in the bowel in sufficient quantity and require this to be held under slight pressure.

### LOCAL SULPHANILAMIDE THERAPY

"Wellcome" brand sterilized sulphanilamide products are now issued in 5-g. double envelopes, in addition to 15-g. sealed bottles. This new envelope pack is designed to give full protection to the sterile contents with maximum convenience in use; supplied in packings of 6, 25, and 100 envelopes. The products available are "Wellcome" brand sterilized sulphanilamide (a crystalline powder suitable for all forms of local chemotherapy) and sterilized sulphanilamide compound (a finely divided free-flowing powder containing 5% of zinc oxide, for use on surface lesions and open wounds only). Further particulars may be had from Burroughs Wellcome and Co. 12, Red Lion Square, London, W.C.1.



## BRITISH MEDICAL JOURNAL

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TREATMENT OF CHRONIC ARTHRITIS  
WITH GOLD

The conspicuous lack of carefully controlled observations on the treatment of rheumatoid arthritis by gold makes the work of Freyburg, Block, and Levy especially welcome. They have made a careful study of the metabolism, toxicity, and mode of action of certain gold preparations, with the stated intention of trying to eliminate some of the vagaries attending this form of treatment. In 1941 they published a report on the first stage of their researches, which was reviewed in this *Journal*.<sup>1</sup> They showed that when gold sodium thiomalate (myocrisin) and gold sodium thiosulphate (sanocrysin), both crystalline salts in aqueous solution, were given intramuscularly, gold appeared in the plasma and urine. Though the larger doses gave high plasma levels, these were not directly proportional to the weekly intake, and it was uncertain whether there was complete absorption from the muscle depots. Excretion by the kidneys was also not proportional to the amount given or the plasma levels, and it never exceeded 1 mg. a week. This led to an increasing retention of gold during the period of administration. Where large doses had been given, as much as 80% remained in the body at the end of a course of injections, and significant amounts of gold were found in the plasma and urine during the next six to twelve months. There was no evidence that the gold was concentrated in the synovial fluid, which contained amounts equal to or less than the amount in the plasma. Five out of six patients treated with weekly doses containing 50 mg. gold had toxic reactions, whereas eight patients given 25 mg. had none. While the findings with myocrisin and sanocrysin were essentially similar and consistent in all subjects, very different results were obtained with colloidal gold sulphide. The plasma and urine levels were much lower than those found with the inorganic salts, and there was considerable individual variation which did not appear to depend on whether the drug was given by mouth or intramuscularly. It was clear that more work was needed to account for the difference between the results with the crystalline and the colloidal preparations; to determine the factors controlling the absorption of the gold and its distribution in the body tissues; and to assess the margin of safety between effective dosage and the development of toxic reactions.

A further report on these researches<sup>2</sup> has clarified some of the points raised in the initial investigation. A comparison between the effects of intravenous and intramuscular injection of the soluble inorganic salts has revealed rapid and complete absorption from the muscle depots. In contrast with this, practically none of the insoluble calcium gold thiomalate was absorbed during the first 24 hours,

and gold thioglucose, injected intramuscularly in oil, was absorbed only slowly and gave plasma values equivalent to two-thirds of those obtained with the salts in aqueous solution. Experiments on animals have shown that the reason for the low values obtained with colloidal gold sulphide is not incomplete absorption of the drug, but the fact that the colloidal particles are taken up in large amounts by the reticulo-endothelial system, especially the liver and spleen. Even when the drug was given intramuscularly, all the gold had left the blood and been phagocytosed in less than one hour.

If gold is to be effective in arthritis it must be given in a form which is easily absorbed and which will remain in the circulation long enough to reach the site where it will exert its action. Dr. Freyburg and his co-workers have shown that such conditions are probably best obtained by intramuscular injections of the water-soluble gold salts. These drugs are potentially toxic and are retained in the body for a long time after the period of administration. As there is no known method of inhibiting the toxic action, which may appear late in the treatment when the patient has large amounts of gold in his system, it is essential to restrict dosage to the smallest amount known to be effective. A detailed study of the optimal dosage has convinced Freyburg that when these crystalline salts are used the equivalent of 25 mg. gold weekly, which in the case of myocrisin is contained in 50 mg. of the salt, is the minimal effective dose, and the total quantity of gold given should not exceed 1 gramme. Using this amount, he claims to have produced results as good as those obtained with 50 mg. gold weekly, and to have lowered the incidence and severity of the toxic reactions. These fell from 41 to 17%, and there were no cases of nephritis, exfoliative dermatitis, or other severe reactions. Smaller doses appeared to be less effective in the treatment of arthritis, and colloidal gold sulphide gave little or no benefit. He concludes that this is due to the fact that gold in this form is immediately phagocytosed and thereby rendered completely ineffective. For the same reason it is unlikely to cause any toxic reactions. Freyburg sums up the present position by saying that so far no dosage of gold can be recommended which is both therapeutically effective and yet below the level of toxicity. This makes it all the more important that only cases likely to obtain benefit should be selected for this treatment, and it is difficult to do this, as it is still unknown where, how, or why gold salts work. Major errors can be avoided if it is realized that the only possible action of gold is to lessen or arrest inflammation. No benefit can be expected in osteo-arthritis, which is a degenerative non-inflammatory joint disease, or in old-standing rheumatoid arthritis with irreversible bone and joint changes. Only patients in the active inflammatory stage of rheumatoid arthritis are suitable candidates for the treatment; and even in them improvement is uncertain, and there is always a risk of toxic complications.

The subject cannot be left without some reference to the recent work of Sabin, though it is still not known how far his results are relevant to human beings.<sup>3</sup> He has induced an experimental arthritis in mice which resembles rheumatoid arthritis in many of its clinical and pathological

<sup>1</sup> *British Medical Journal*, 1941, 2, 882.  
<sup>2</sup> *Proc. Mayo Clin.*, 1942, 17, 534.

<sup>3</sup> *Proc. Mayo Clin.*, 1942, 17, 542.

manifestations, and has shown that it can be successfully treated with certain gold salts provided treatment is started within three weeks of the onset of the disease. If treatment is delayed until destruction of cartilage and obliteration of the affected joints have occurred little or no improvement can be expected. To obtain a full cure with no risk of relapse full doses are required, which cause toxic reactions in a large number of mice. He found that the therapeutic effectiveness of gold compounds depended chiefly on the concentration of gold, whereas toxicity depended more on the nature of the radical to which the gold was attached and on the degree of solubility. Colloidal gold was without effect. These ideas led to the discovery of calcium aurothiomalate, which was effective in mice in even smaller dosage than the corresponding sodium salt and much less toxic. This compound is now being tested in man, and it is as yet too early to decide whether it is equally non-toxic in human arthritis, but it is already clear that it can cause dermatitis and stomatitis.

### TRILENE HAZARD

Trichlorethylene (trilene) is a chlorinated hydrocarbon of the aliphatic series, of which chloroform is the best-known representative. It is a colourless liquid with a characteristic smell; when sold as an anaesthetic it is stained blue for the purpose of identification. It has been known in industry for at least thirty years, being used for degreasing metals; in the extraction of oils and fats; in painting, enamelling, dyeing, and dry-cleaning; in the boot and shoe industry; in textile manufacture and the printing industry; as an insecticide, a disinfecting agent, and an impregnation material; in cleaning films, photographic plates, and optical lenses; in the chemical industry; in gas purification; and as a rubber solvent. It differs from other chlorinated hydrocarbons by not producing any severe lesion of the liver or kidneys in experimental animals; only Castellino<sup>1</sup> and Lande<sup>2</sup> have reported any changes. Toxic jaundice has been recorded in man by Bridge<sup>3</sup> and Wilcox,<sup>4</sup> but the evidence for attributing it to trichlorethylene is quite inadequate. Like similar substances, trichlorethylene may produce dermatitis by its solvent action upon the fat in the skin. In industry, however, the chief danger of this substance has been that of acute narcosis following prolonged exposure to high concentrations. Stüber<sup>5</sup> has reported 117 cases of unconsciousness in workers in German factories, of whom twelve died; similar cases have occurred in England, and between 1921 and 1935 thirty-one cases, three of which were fatal, were reported to H.M. Chief Inspector of Factories. This knowledge led Striker, Goldblatt, Warn, and Jackson<sup>6</sup> to use trichlorethylene as an anaesthetic. Hewer and Hadfield,<sup>7</sup> first reporting its use in England, considered that it resembled chloroform in its effect, but was less potent as an anaesthetic, more potent as an analgesic, and less toxic. The advantages of the drug are the absence of

irritation to the respiratory tract, the small amount of oozing from cut tissues, the high degree of analgesia, and its relative cheapness. The disadvantages are the difficulty in obtaining muscular relaxation, its tendency to raise the respiratory rate, and the fact that it is retained for many hours in the blood stream, thus tending to prolong the stage of recovery.

It has never been understood why cranial-nerve palsies have been reported from German industry, and yet no case has ever occurred in Great Britain. As early as 1916 Plessner<sup>8</sup> reported that patients suffering from chronic trichlorethylene poisoning showed complete bilateral paralysis of the fifth nerve; and since then German factory inspectors have described corneal ulcer resulting from a foreign body in the eye, the workman not having been aware of its presence because of an anaesthesia of the cornea. Of Stüber's 284 cases ten showed fifth-nerve paralysis and nine optic disturbances. These included blindness from optic atrophy in two, and retrobulbar neuritis with disturbances of the colour field in the others. Isenschmid and Kunz<sup>9</sup> described the case of a man who, after exposure to the vapour of trichlorethylene in cleaning steel cylinders, developed retrobulbar neuritis, left-sided paralysis of his tongue, and polyneuritis of all four limbs. No evidence has ever been brought forward that any of these toxic manifestations were caused by phosgene, which can theoretically be produced as a breakdown product from trichlorethylene. Oljenick<sup>10</sup> used the drug for the relief of pain in trigeminal neuralgia. The vapour is inhaled from broken capsules as in the case of amyl nitrite; the method was popular for some time, but eventually proved disappointing. Jackson<sup>11</sup> pointed out that no local paralysis resulted from this treatment, and suggested that trigeminal paralysis was due to some other poison and not trichlorethylene. Because of its analgesic properties it has also been used to relieve angina, but again the results have been disappointing.

Cases of trigeminal paralysis following trilene anaesthesia have recently been reported. In this issue of the *Journal* Humphrey and McClelland, and Carden, report a total of seventeen cases in which cranial-nerve palsies, sometimes with herpes, developed after general anaesthesia. In two of the cases reported by Humphrey and McClelland the patient died; and at least four other fatal cases are known to have occurred in different parts of the country. In all of these a closed-circuit apparatus was used, and, despite the fact that thirteen out of fifteen of the cases of Humphrey and McClelland did not have trilene as the anaesthetic, the notorious reputation of trichlorethylene led to its being suspected as the noxious agent. Cox proved that when trichlorethylene is passed over soda-lime dichloroacetylene is formed, and—as Dr. Donald Hunter observes in our correspondence pages—this has been confirmed by Milton and Graham. Humphrey and McClelland have shown that this substance is highly toxic to rabbits. It caused death in convulsions, and histologically gross changes were present in brain, liver, and kidneys. Milton, Graham, Perry, and

<sup>1</sup> *Folia med.*, Naples, 1932, 18, 415.

<sup>2</sup> *Arch. Mal. profess.*, 1939, 2, 454.

<sup>3</sup> *Ann. Rep. Chief Inspect. Fact.* for 1932: 1933, 197.

<sup>4</sup> *Proc. roy. Soc. Med.*, 1934, 27, 455.

<sup>5</sup> *Arch. Gewerbepath. u. Gewerbehyg.*, 1931, 2, 395.

<sup>6</sup> *Anesth. & Analges.*, 1935, 14, 68.

<sup>7</sup> *British Medical Journal*, 1941, 1, 924.

<sup>8</sup> *Klin. Wschr.*, 1916, 53, 25.

<sup>9</sup> *Schweiz. med. Wschr.*, 1934, 65, 530.

<sup>10</sup> *J. Amer. med. Ass.*, 1928, 91, 1085.

<sup>11</sup> *Anesth. & Analges.*, 1934, 13, 198.

Hunter have confirmed these results by similar experiments on rats. It seems probable that the trigeminal anaesthesia in German industry which has been up to now such a mystery must be due to dichloroacetylene either present as an impurity or formed by the close proximity of alkali.

The most important conclusion from these observations, however, is that trilene must never be used in a closed-circuit anaesthetic apparatus. Not only is dichloroacetylene a highly toxic substance and dangerous to the person being anaesthetized, but it is stored in the soda-lime canister and may be volatilized by a later anaesthetic, particularly if ether is used. It may thus have toxic or even fatal results, even though no trilene be used in the subsequent anaesthetic.

### FAMILIAL ANAPHYLACTIC DEATH

Human death from allergic shock is a very rare phenomenon. Yet many medical men with long experience of the administration of antitoxic sera have experienced the tragedy of death occurring within half an hour of the injection, often a small dose, of therapeutic antitoxin. These rare fatal accidents do not happen as a rule in persons who are known to be sensitized by a recent injection of foreign protein: in them the anaphylactic reaction is rare compared with its practically constant occurrence in sensitized animals, and when it occurs in severe form with respiratory distress and widespread oedema it is seldom fatal and responds well to the injection of adrenaline. The fatal case is most often a child or young adult with little or no history to suggest hypersensitivity to foreign protein, though careful questioning afterwards may reveal some personal or familial allergic tendency. This allergic state, usually of a broad non-specific character, either is hereditary or is acquired in early childhood. A case of the kind with an interesting family history has lately been reported.<sup>1</sup> A number of nurses in a mental hospital were being used as volunteer controls in tests to determine the rate of cutaneous colour-spread among schizophrenics. The test substance was a solution of guinea-pig haemoglobin, of which 0.2 c.cm. was injected intradermally. Within 10 minutes of the injection one of the nurses died in acute respiratory distress and cyanosis despite all attempts at resuscitation with intracardiac adrenaline and artificial respiration. At necropsy there was an inflammatory haemorrhagic patch at the site of inoculation, the lungs were distended and emphysematous, and there were marked hyperaemia and oedema of the respiratory mucous membranes. It was, in fact, the typical picture of anaphylactic shock as seen in the guinea-pig, and this violent reaction, due to the clash of antigen with tissue antibody and characterized by acute spasm of smooth muscle (in this case the terminal bronchioles), together with increased capillary permeability, was set off by a small intradermal injection of an unusual foreign protein. For the first time on record<sup>2</sup> the pathologist carried the diagnosis a step further by performing tests of passive anaphylaxis with the patient's serum obtained by cardiac puncture post mortem. Small amounts of the serum were injected into the forearms of three volunteers and guinea-pig haemoglobin applied by scratch 24 hours later; two of the volunteers showed the typical flare and wheal of the Prausnitz-Küstner phenomenon. Although at the time of the test the affected nurse denied having had any allergic disease, the mother revealed

afterwards that the patient had had asthma for 8 years and was sensitive to a variety of foreign antigens, that she herself was subject to asthmatic attacks, a son to urticaria, and a daughter to acne. Moreover, a cousin of the mother had died of allergic shock within 3 minutes of the injection of 10 c.cm. of Behring's antidiphtheritic serum given because she was a contact of a fatal case of diphtheria and had some exudate on her throat. It was the first reported American death from anaphylaxis after the use of diphtheria antitoxin. The fear of such a tragic accident is a great bogey, not so much to the "fever expert" who is giving antitoxin every day but to the practitioner who, knowing of the possibility, however remote, and realizing the adverse effect such an accident might have upon his practice avoids whenever possible the responsibility of injecting antitoxin. One result is that children still die of diphtheria who might be saved if the doctor would give antitoxin as soon as he suspects the disease. The modern refinements in antisera mean that at this early stage of the infection a protective dose can be given in 2 to 3 c.cm. with the minimum of discomfort or subsequent upset to the child.

How are these allergic deaths to be avoided? Certainly not by the practice of giving a preliminary intradermal or subcutaneous injection of 0.2 to 0.5 c.cm. of antitoxin or normal horse serum to act as a desensitizing dose, for experience has shown that even a minimal dose of foreign protein will act as the trigger in a hypersensitive person. Careful inquiry about any personal or familial history of allergic disease—eczema or urticaria, hay-fever or asthma—is the surest way to reveal the hypersensitive state. To test for sensitivity in a doubtful allergic child the scratch and conjunctival reactions, using a 1 in 10 dilution of the animal serum to be injected, are probably safe and reliable. If the intradermal test is used the serum should be diluted 1 in 100. Desensitization of naturally allergic persons is practically impossible, but if serum therapy is essential a degree of temporary desensitization may be brought about by a graduated series of intradermal or subcutaneous injections of antitoxin half-hourly, beginning with 0.1 c.cm. of a 1 in 100 dilution. Adrenaline in a dose of 3 to 5 minims of a 1 in 1,000 dilution must always be kept ready to deal with any untoward reaction.

### THE SCOTT AND UTHWATT REPORTS

To read Blue Books or White Papers is a discipline only to be undertaken by those who have some background of special knowledge. But to read a Penguin Special is a relaxation, and the producers of these little books have been happily inspired to include one which gives a summary of the Scott and Uthwatt reports.<sup>1</sup> These formidable documents—the first concerning the development of rural areas consistently with the maintenance of agriculture, and the second the public control of the use of land—are presented in a digestible form, and the editor, Mr. G. M. Young, who is a historian and has been a civil servant, contributes an introduction. Briefly, the problem is the reconstruction of the country and the town, but this summary with all its readability leaves us in little doubt of the difficulties that have to be faced before that is achieved. There are all the devastated towns to be rebuilt first, and there may be a great shortage of labour and materials. Old slums have to be cleared away and new housing estates provided, and the former slum population cannot be put under an anaesthetic meanwhile. We have in Great Britain some beautifully planned towns—Bath, for example, and Salisbury—

<sup>1</sup> Hunt, E. L., *New Engl. J. Med.*, 1943, 228, 502.

<sup>2</sup> Lund, H., and Hunt, E. L., *Arch. Path.*, 1941, 32, 664.

<sup>1</sup> *Country and Town: A Summary of the Scott and Uthwatt Reports*. A Penguin Special. Penguin Books, Harmondsworth, Middlesex. (9d.)

but the planning was carried out on clear sites and on a small scale, and the same is true of the New Town of Edinburgh. Readers of Disraeli's *Sybil* will recall Wodgate, an industrial territory which grew and prospered in a state of complete anarchy, like a miners' camp in California. There are many Wodgates—the Potteries, the cotton and woollen countries, Clydeside and Tyneside, and London itself. To get London back to what it might have been if this growth had been controlled from the beginning will not be a task for one generation only. The principles of the Scott and Uthwatt reports are that there shall never be any uncontrolled encroachment on food-bearing land, and that the town—that is, the citizens of the town—shall be given power to own the town. We may well envy our descendants, and they perhaps may mingle their pitying recollection of us with some infusion of gratitude because it was in our distressful time that a beginning was made.

### HUMAN BIOSYNTHESIS OF VITAMIN B<sub>1</sub>

It has always been assumed that man, unlike the rat and some ruminants, is unable to synthesize vitamin B<sub>1</sub>, and that he therefore depends entirely on food for his supply of it. Several studies on this vitamin during the last four years do not show very close agreement on the minimal human requirement. Thus signs attributed to vitamin-B<sub>1</sub> deficiency have been noted on daily intakes varying from 0.25 mg. to 0.6 mg. per 1,000 calories of diet.<sup>1-5</sup> There is a discrepancy not only between these figures but also in the time taken to induce deficiency symptoms on an experimental diet poor in vitamin B<sub>1</sub>. Why should one individual show deficiency symptoms on an intake of 0.5 mg. of vitamin B<sub>1</sub> per 1,000 calories daily, while another can do hard physical work and keep well on an intake of only 0.25 mg.? Hitherto studies have been made by giving foods poor in vitamin B<sub>1</sub> to human volunteers. Najjar and Holt,<sup>6</sup> however, appear to be the first to have devised completely synthetic diets in studies on human vitamin deficiency. They gave nine adolescent males a diet of vitamin-free casein, crisco (a vegetable fat), dextrin-maltose, a mineral mixture, and adequate amounts of the known vitamins except B<sub>1</sub>. This was added to the diet in varying amounts, beginning with 1 mg. daily. The daily intake was slowly reduced by 0.1 mg. to 0.2 mg. and kept at this level for months. No deficiency symptoms were observed. Finally vitamin B<sub>1</sub> was omitted from the diet altogether. In the course of three to five weeks there was clear clinical evidence of vitamin-B<sub>1</sub> deficiency in only five out of nine of the subjects. Examination of the stools, however, showed that the five with signs of deficiency had practically no free vitamin B<sub>1</sub> in their stools, whereas the four who remained symptom-free had large quantities in their stools, in spite of a zero intake. The most likely explanation was that intestinal bacteria were synthesizing vitamin B<sub>1</sub> in the large intestine, from which it was absorbed. To obtain direct evidence of this, succinylsulphathiazole (which is bacteriostatic in the intestine) was given to one of the subjects excreting vitamin B<sub>1</sub> in his faeces. In a week the faecal excretion fell from 37 to 52 micrograms daily down to zero and returned to its former value on discontinuance of the drug. Absorption of vitamin B<sub>1</sub> from the large intestine had still to be proved. This was done by administering retention enemas containing vitamin B<sub>1</sub>; a pronounced rise in the urinary excretion of vitamin B<sub>1</sub> was the result.

These observations demonstrate that the biosynthesis of vitamin B<sub>1</sub> can occur in man, and would explain the discrepancies in the human vitamin-B<sub>1</sub> requirements found by different observers. It also raises the question whether man requires an exogenous source of vitamin B<sub>1</sub>. Can he synthesize enough? It may be that the human requirements of B<sub>1</sub> cannot be sustained for an indefinite length of time by bacterial synthesis. This may only operate when the oral intake of the vitamin is low. It is also possible that minute amounts of vitamin B<sub>1</sub> by mouth are needed for the growth of bacteria. Since it is likely that the biosynthesis of vitamin B<sub>1</sub> is affected by diet, as is known in the case of animals, the vitamin-B<sub>1</sub> requirement of man must be considered in terms of particular diets rather than in general. One further point is worthy of emphasis. Sulphonamide drugs can apparently inhibit the biosynthesis of vitamin B<sub>1</sub> in man. This may be of clinical significance in the case of patients treated with such drugs who are on diets poor in vitamin B<sub>1</sub> or whose food intake is restricted.

### NIGHT VISION BY RED LIGHT

In 1897 Breuer and Pertz established the rather academic fact that the fovea of the macula lutea is less sensitive than the paracentral area both to white light and to all colours except red, to which indeed it was more sensitive. These findings have found practical application during the present war. Foveal vision is of course preferable to paracentral vision, since it is so much sharper, and on theoretical grounds foveal vision could be called into play in low intensities of illumination only if the light used was red in colour. In practice, seeing in the dark—i.e., under conditions of low intensity of illumination—is best accomplished by not looking directly at the object: the seeing is done by the paracentral area, with its greater sensitivity to what amount of light is available. D. Y. Solandt and C. H. Best<sup>1</sup> give an account of a fascinating series of experiments with red lights to enable pilots and navigators to use their foveal vision in the relative darkness of low illumination. Red lighting is now used on aircraft instrument panels and in the Royal Navy. Red goggles are a helpful addition, but the goggles must fit well, as a small leak of white light can ruin their effectiveness. The red light used for lighting purposes is of a limited character; on spectrographic examination it must show little or no energy output at a wave-length below 6,000 Å or preferably 6,200 Å. By enabling the use of foveal vision, the period necessary for dark-adaptation becomes reduced. This is an important corollary of the work recorded by Solandt and Best. Under the special conditions of night vision in red light the problem of dark-adaptation of course still persists, and the authors record modifications they incorporated in the Hecht-Shlaer adapter for the carrying out of the necessary tests for dark-adaptation of the fovea to red light.

<sup>1</sup> *Canad. med. Ass. J.*, 1943, 49, 17.

The Medical Research Council has established a Unit for Research in Human Nutrition as part of its staff organization, and has appointed Dr. B. S. Platt as Director. Temporary accommodation has been provided at the National Hospital for Nervous Diseases, Queen Square, London. Some part of the investigations undertaken by the unit will be directed towards nutrition problems in the Tropics. Among other things Dr. Platt will continue the work, for which he joined the Council's staff in 1938, of co-ordinating a programme of nutritional investigations in the Colonies by arrangement between the Colonial Office and the Council.

<sup>1</sup> *J. Nutr.*, 1943, 25, 71.

<sup>2</sup> *Arch. Intern. Med.*, 1940, 66, 785; 1942, 69, 721.

<sup>3</sup> *J. Nutr.*, 1942, 24, 139; *Proc. Mayo Clin.*, 1941, 16, 433.

<sup>4</sup> *Ibid.*, 1943, 26, 399.

<sup>5</sup> *Amer. J. med. Sci.*, 1942, 203, 569.

<sup>6</sup> *J. Amer. med. Ass.*, 1943, 123, 633.

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## WITH THE FRIENDS' AMBULANCE UNIT IN CHINA

### GENERAL PRACTICE AMONG THE HAKKA

by

HANDLEY LAYCOCK, M.B., F.R.C.S.

(Until Recently a Member of the F.A.U., China Section)

War leads us into strange places, and one of the unexpected occupations it has found for me is being in general practice among the Hakka people of South China. At present my life falls into two phases. In one I look after a hospital for Chinese soldiers and refugees in a large and more or less important city, and in the other, as I say, I am in general practice among the Hakka. The fact that the Cantonese language is used in the city and the Hakka language in the country and that I am no linguist is just one of the little difficulties that go to make life really complicated.

Our Hakka out-patients are mixed up with Cantonese soldiers and a motley collection of beggars and refugees. The latter are usually starving, desperate, and all too often truculent in their demands for money, food, and medical attention. They are a ghastly by-product of war and one feels very sorry for them, but the Hakka villagers are more normal and much more reliable.

The process of taking the temperature had always seemed a simple one to me. The Hakka child has shown me that it can be made almost impossible. When he is presented with a thermometer he is apt to do surprising things—to close his mouth and eyes, to arch his back, and sometimes to start sweating as if in terror. When he is persuaded to open his mouth he usually puts his tongue out and refuses to put it in again. Unfortunately at the moment my grasp of the language is such that I can ask for the tongue to be put out but have not yet learnt the correct way of suggesting that it be withdrawn. When he has the idea that the thermometer is to go under the tongue he usually presses the latter firmly against the palate, keeping the mouth wide open. When finally induced to shut his mouth he is apt to bite the instrument in half with a vicious snap. When at last all seems settled, the patient is quite liable to open his mouth and let the thermometer fall out on to the stone floor! So I have planned, but not yet been able to construct, a special device for taking the temperatures of the Hakka people. Practitioners among other simple people may care to copy. The body of the thermometer is protected from bites by a thin brass tube, and the whole is suspended by a short length of chain from a band previously strapped round the forehead.

#### "Simple" Dermatology

Many of the patients have skin troubles. I never fancied myself as a dermatologist, but Hakka dermatology is easy. There are three diagnoses—ringworm, scabies, and ulcers of the leg. The ringworm is not atypical but is sometimes very extensive. We see scabies in its grossest forms, though the worst cases occur among the soldiers rather than the villagers. A man comes to us covered from the neck downwards with scabs like the rupia of late secondary syphilis. Sometimes the whole surface of the body is covered with scales and resembles ichthyosis. I believe these types are simply due to secondarily infected scabies, because their disappearance with sulphur treatment is so rapid and so complete. We can buy crude brimstone, by one of the freaks of wartime economics, at less than the current price by weight of rice, and we mix it with pork fat in large quantities. The sufferers are invited to attend a "scabies clinic" on Tuesday, Wednesday, and Thursday afternoons and to bring clean clothes with them. They have a bath first and are then rubbed all over with our ointment, and the worst cases get better. I have also been surprised to find that some of the ulcers resistant to other forms of treatment begin to do well when sulphur is applied to them. Many of these ulcers undoubtedly start where the lesions of scabies are scratched, and it looks as though the scabies may remain active and prevent the ulcer from healing.

The ulcers themselves are quite remarkable. Some of them would create a major sensation if seen in "casualty" at a London teaching hospital. Most of them would be labelled "gummatous" if shown in the Final Coojoint vivis vocibus. As regards the syphilitic aetiology, we do not have the normal laboratory facilities. Our supplies of organic arsenical preparations are small and they have to be reserved for special cases. When simple antiseptic treatment of the ulcer fails and where relapses occur I have several times seen dramatic results follow a single intravenous injection of neosarphenamine. Varicose veins are relatively uncommon and we do not see the typical "varicose ulcer" so common at home. Most of our cases give a history of trivial trauma: "I struck it with a piece of bamboo"; "I

scratched a mosquito bite"; "I was bitten by a chicken"; and so on. The ulcer is then enlarged, secondarily infected, and prevented from healing by the repeated application of filthy poultices purchased from the village herbalist or concocted according to the recipe of a misguided neighbour. These are usually composed of vegetable matter and resemble stale cow-dung. I believe an enormous number of completely crippling ulcers are caused and maintained in this way alone. In a country where the struggle for existence is always fierce, these ulcers must frequently be the undoing of their unlucky owners.

An ulcer of another type might be called the "beriberi ulcer". It is quite characteristic, and I have seen half a dozen in the last six months. It is roughly rectangular in shape and about 6 in. by 2½ in. on the dorsal aspect of the foot, extending above and behind the lateral malleolus, which sometimes escapes and has an island of intact skin upon it. The ulcer was in one case bilateral. The patient always gives the same history. He had swelling of the feet—beriberi is very common in this district—and applied Chinese medicine in an attempt to cure this. I do not know of what this particular application consists, but it acts like strong caustic soda, and the sufferer comes to us after about a week with a dead white area of skin like chamois leather covering the area described. In a few days this separates, leaving a deep ulcer in which the extensor tendons may be fully exposed. In one case the whole foot had become so grossly infected that I felt obliged to amputate, but the patient, who was much the worse for starvation and septic absorption, did not survive. A case I am treating at the moment has been dressed daily since before the slough separated and has been on a good diet. The ulcer was very large, but with antiseptic dressings (Dakin's solution at first and later acriflavine) secondary infection has been minimized and epithelization is proceeding so rapidly that the skin-grafting which I at first contemplated now seems superfluous.

#### Settling the Bill

Many of the patients to whom we give free treatment bring presents with them—eggs, sweet potatoes, nondescript vegetables, peculiar sodden pink cakes, and so on. Often these are the spontaneous expression of a sincere appreciation for what has been done. One man, from whose upper lip I had removed a peculiar adenomatous tumour, said thank you with fifteen eggs and a plateful of litchis. I soon discovered, however, that in some cases the real significance of the presents was that the sufferer was anxious to give a gentle hint to the doctor to try a little harder. Surely a doctor who had been put under a sense of obligation by receiving a dozen eggs would feel bound to make even more desperate efforts to effect a rapid cure! One old lady with severe corneal opacities for which I could do nothing brought me an embarrassingly large offering of fruit and vegetables, but I persuaded her to take most of them away again.

Sometimes the doctor goes visiting. Passing through a Hakka village he is quickly recognized and a commotion follows. He is besought to come and advise about the local sick. On these occasions one never knows what to expect. The most ghastly spectacle may suddenly be brought out of some dark back room for inspection. Once I found a 16-year-old girl who had had an ulcer for two years. It three-quarters encircled the leg at the middle of the calf and had eaten deeply into the muscles, which were partly gangrenous and stinking. This had been caused by a small injury and prevented from healing in the usual way—the continuous applications of filthy poultices. From chronic toxic absorption the girl appeared almost moribund, was quite unable to stand, was in great pain, as well as being a nuisance to the whole village on account of the smell. We arranged to have her carried in a basket to our dressing room, where I cut away without anaesthesia a large quantity of dead muscle. It was then possible for her to arrange to live near by and to come in daily for dressings. As she is one of our more successful cases, I say boastfully that she now walks unaided, her ulcer is very much smaller—there will always be a contracture of the muscle—she is fatter, and definitely possesses that certain something called "S.A."

The effect of applying microcrystalline sulphonamides to the monkey's brain was examined with the aid of electro-encephalography by H. Jasper and his colleagues (*Surg. Gynec. Obstet.*, 1943, 76, 599). It was observed that sulphathiazole directly applied to the cerebral cortex resulted in convulsions which developed into generalized epileptic seizures. Intravenous injection of sodium sulphathiazole produced convulsions with a concentration of the unconjugated drug of over 80 mg. per 100 c.c.m. When the drug was one-quarter and one-half this amount excitatory effects could be observed in the electro-encephalogram. The local application of sulphanilamide, sulphapyridine, and sulphadiazine to the uninjured cortex was without effect. The authors recommend a combination of sulphanilamide and sulphadiazine for local application to the brain.

## OPHTHALMOLOGICAL RESEARCH AT OXFORD

The Lord Mayor of London gave a luncheon on Feb. 22 at the Mansion House to representatives of industry and public life to meet the Vice-Chancellor of the University of Oxford (Sir David Ross, Provost of Oriel) and the members of its Ophthalmological Research Endowment Committee.

Sir DAVID ROSS said that what Oxford was concerned with to-day was not the task of making tolerable the lot of the blind but that of preventing blindness and, not less, of preventing defects of sight, many of which fell far short of blindness and yet were a grievous affliction and a grievous handicap to usefulness. The number of blind persons in this country was apparently growing, though not sensationally so; in March, 1942, there were 75,306 blind persons in England and Wales, nearly a thousand more than in the previous year. The causes of blindness seemed to be at least keeping pace with the attempts to prevent it; defects of eyesight short of blindness appeared also to be on the increase. The existence of 75,000 blind people in a population of something over forty millions was itself a great evil; but a little probing into the facts of blindness showed that the position was more serious than even this figure indicated, for many years often elapsed between the onset of the disease and its culmination in blindness. In all accidents leading to blindness the difference between the mean age of onset and the mean age of blindness was 3.11 years; in glaucoma it was 2.94 years, in cataract 5.1, in uveitis 12.4, in trachoma 25.58, in myopia 36.24. Many therefore must suffer for years from severe eye disease but die without swelling the numbers of the blind, and still more for many years before they swelled those numbers. How were those great evils to be remedied? Three things were certainly necessary: improvement of the ophthalmic services of the country, education of the public about the care of the eyes, and research. Of the first two of these research was the essential basis, for improvement of the ophthalmic services required the turning out of a larger number of very highly-qualified oculists, and it was one of the missions of a research institute to turn out, as well as original researchers, practising oculists who would bring the latest results of research to bear on the practice of their profession. And for the education of the public also it was essential that those who carried on this education, in schools and elsewhere, should be *au fait* with the latest and best results of research.

## The Need for Co-operation

Such research could be most effectively pursued not in an isolated ophthalmological institute but in a university, where the workers at this subject could be in close contact with workers in kindred subjects. For while specialism was constantly growing it was at the same time being found more and more that specialists in one subject could profit from co-operation with specialists in other subjects. Thus, many defects of eyesight were due to nutritional factors, and so the ophthalmologist must work hand-in-hand with the biochemist. Phenomena of the eye or of eyesight were sometimes the first indication of disease in some quite different part of the body, and so the ophthalmologist must work hand-in-hand with the professors of other branches of medicine. New drugs like the sulphonamides and penicillin, which were so potent in other branches of medicine, had a utility also for diseases of the eye, and so the ophthalmologist must work hand-in-hand with the pharmacologist and the physiologist.

There was another form of co-operation—that between research and industry. It had in recent months been very forcibly impressed upon this country that in its endowment of research it lagged behind some other countries, and that its industry had suffered much thereby. Those who were engaged in industry must know of many spheres in which the eyesight of the workers was a matter of the greatest consequence to the quality of the product. This was clearly so in all precision work. But what was more curious and not so easily recognized was that for certain special kinds of work characteristics of eyesight which would in most respects be a handicap to the worker became a positive advantage. Many workers were put on very fine jobs without any previous attempt to find out whether they were suited to them, and when trained were discovered to be unable to continue the job because of eye-strain. The wastage might have been saved by the application of eye tests before training. Accordingly, it would very often be a great advantage to employer and worker alike if, before the worker undertook a certain kind of work, he were to undergo a thorough examination of his eyesight. That was one way in which an ophthalmological institute could render great benefits both to employers and workers. There was also the question of the lighting of factories. Both physicists and ophthalmologists had applied themselves to this, but the former were apt to concentrate on the quality and intensity of the light, and the latter on the angle of incidence and direction of the rays; the problem would not be solved until both types of scientists

tackled it together. Some of the work of the Ophthalmological Institute at Oxford would be purely scientific, each new problem being suggested by the existing knowledge and experience of the worker, one problem constantly arising from the solution of another. There would also be work, scientific in its character, but practical in its inception and in its aim. Employers would put to the institute some practical question about lighting, or about prevention of accidents to the eye, or about the excessive incidence of eye trouble in some department, and the institute would do its best to give a practical answer to the practical question. And just as theoretical problems often turned out to have a quite unexpected practical bearing, so the solution of a practical problem might often lead to an important theoretical advance.

## ORDER OF ST. JOHN OF JERUSALEM

The following medical promotions in and appointments to the Venerable Order of St. John of Jerusalem have been announced in the *London Gazette* of June 25, 1943, and Jan. 4, 1944, respectively:

*As Knights:* Dr. K. H. Beverley, Lieut.-Col. W. Blackwood, Dr. L. E. Ellis, Capt. A. C. W. Knox. *As Commanders (Brothers):* Capt. F. E. Bendix, Dr. J. A. Carman, Dr. J. C. Glen, Brig. R. M. Gossline, Capt. H. F. J. Norrie, and Capt. R. V. Steele. *As Officers (Brothers):* Dr. E. S. Abraham, Major I. A. Anderson, Major J. H. Banks, Dr. A. B. Barbour, Lieut.-Col. A. E. Campbell, Dr. T. S. Evans, Dr. K. P. Groves, Dr. B. Hart, Dr. H. R. McAlcenan, Dr. C. F. McGuffin, Dr. C. G. Mackay, Col. J. C. Mackenzie, Major G. W. Parry, Dr. R. R. Roger, Dr. N. J. L. Rollason, Col. P. J. Ryan, Dr. A. U. Sheikh, Dr. M. M. Scott, Surg. Rear-Admiral C. P. G. Wakeley, and Lieut.-Col. C. A. Whiffell. *As Officers (Sisters):* Dr. K. Arditt-Brice and Dr. A. M. Pennell. *As Serving Brothers:* Dr. K. V. Adalia, Dr. O. D. Ballinger, Dr. I. H. Beattie, Dr. J. W. Bennett, Dr. W. E. H. Bull, Dr. A. Chaffron, Dr. O. T. J. C. de H. Clayre, Dr. R. V. S. Cooper, Dr. C. P. Cross, Dr. P. T. J. Doss, Dr. D. Downie, Mr. F. H. Edwards, Dr. James Ewins, Dr. C. E. H. Gaier, Dr. D. G. Geefield, Dr. W. A. Hawes, Dr. G. E. Hayward, Dr. F. L. Heap, Dr. F. W. Hebblethwaite, Dr. L. W. Heffernan, Dr. W. A. Hogg, Dr. A. G. Holman, Dr. J. L. Holt, Dr. J. S. Hutchison, Dr. J. M. Johnstone, Dr. T. P. Lalonde, Dr. J. P. Little, Dr. K. M. Macdonald, Dr. A. D. McQueen, Dr. D. J. Martin, Dr. F. C. Mathew, Dr. S. R. Matthews, Dr. R. W. L. May, Dr. D. McF. Millar, Dr. J. Pirie, Dr. G. H. Pitt, Dr. C. P. Porter, Dr. J. D. Robertson, Dr. H. G. Robinson, Dr. Marshall Robinson, Dr. N. A. Rymor, Dr. H. M. Savory, Dr. R. Scott-Reld, Dr. N. L. Tweedie, Dr. C. A. Wiles, Dr. H. C. Worth, and Lieut.-Col. A. H. O. Young. *As Associate Serving Brothers:* Dr. S. C. Biswas and Capt. D. P. Nath. *As Serving Sisters:* Dr. Millicent Fox, Dr. E. W. Lee, Dr. M. M. Silho, Dr. H. Standring, and Margaret, Lady Ramsden.

*As Knights:* Dr. H. A. Beatty, Major-General S. R. Burston, Dr. T. H. Goddard, and Col. J. A. H. Sherwin. *As Commanders (Brothers):* Lieut.-Col. O. A. Cannon, Dr. A. W. D. Mobbs, Lieut.-Col. F. O'Neill, and Dr. J. Rodley. *As Commander (Sister):* Dame Louise Mellroy, M.D. *As Officers (Brothers):* Lieut.-Col. C. G. Booker, Dr. W. N. Brennen, Dr. L. J. Dunstone, Lieut.-Col. G. D. English, Capt. A. E. E. Grounds, Dr. C. N. Groves, Major L. Haden Guest, Lieut.-Col. G. P. Howlett, Dr. E. M. Humphrey, Dr. M. J. Kelly, Lieut.-Col. D. S. Mackay (since deceased), Dr. H. A. Matheson, Dr. D. McF. Millar, Dr. A. R. Morton, Dr. J. E. O'Donnell, Dr. Rupert Palmer, Dr. W. E. Peck, Dr. R. R. Scott, and Dr. F. W. Vint. *As Serving Brothers:* Dr. J. B. Adamson, Dr. F. H. Alexander, Dr. H. C. Altwood, Dr. W. S. Booth, Dr. A. C. Brown, Dr. H. S. Brown, Col. A. L. Buchanan, Dr. A. Byrne-Quinn, Dr. P. T. Cairns, Dr. R. Chester, Major H. Davenport, Dr. L. S. Debenham, Lieut.-Col. C. G. L. van Dyk, Dr. W. S. Ghal, Lieut.-Col. H. M. Jamieson, Dr. J. F. Jarvis, Dr. S. H. Keshen, Dr. J. W. Mackay, Dr. H. N. Middleton, Dr. R. T. E. Naismith, Dr. T. J. Nicholl, Dr. B. Sweeten, Major L. G. Tassie, Dr. R. Tudor-Edwards, Dr. C. W. Walker, Dr. Arthur Walson, Capt. E. M. B. West, and Dr. R. N. P. Wilton. *As Associate Serving Brothers:* Dr. B. Gopal, Dr. J. V. Reuben, and Capt. N. J. Vazifdar. *As Serving Sisters:* Dr. Gwendolen M. Brown, Dr. G. A. Dancy, and Dr. G. M. B. Totland.

The Organization of a Hospital Rehabilitation Department is the title of E.M.S. Memorandum No. 6 recently issued by the Ministry of Health. While the memorandum recognizes that each hospital must be left to consider the scheme best suited to its own particular problems, it nevertheless outlines a general programme, lists the various procedures commonly employed at different stages of rehabilitation, and indicates the facilities—equipment as well as personnel—essential to carrying out this programme. The Ministry states that it is desirable that all these activities should be under the personal supervision of one member of the medical staff. This, it is held, in no sense interferes with the continuity of control exercised over the individual patient by the original physician, surgeon, or obstetrician who orders rehabilitation treatment and with whom the medical supervisor will work in close association. The memorandum includes details of courses on rehabilitation arranged by the Ministry of Health; for instance, week-end courses for doctors are held from time to time at certain selected centres, where lectures and demonstrations are given by experts. Full particulars of these can be obtained from the Regional or Sector Hospital Officer. The memorandum itself can be obtained through any bookseller or from H.M. Stationery Office (2d.).

## Correspondence

### India's Population Problem

SIR,—Prof. Blacklock's reasoned statement of the problem of population and food supply in India has had a reception which is strikingly reminiscent of that accorded to Mr. Churchill's pre-war efforts to arouse us to a sense of the dangers that threatened this country. The critics of Prof. Blacklock's paper have seized the opportunity of repeating the parrot cry, "Malthus has been discredited." Obviously they have never read what Malthus wrote; his great "principle," briefly and largely in his own words, was that in man as in other animals there is a universal tendency for population to out-run food supply, so that the checks imposed by famine, war, pestilence, misery, and vice must continue to maintain the balance unless preventive checks in the form of delayed marriage, celibacy, and sexual restraint are applied. The teaching of Malthus has been completely misrepresented by persons who were ignorant of the proviso, which is an essential part of the doctrine. The above methods of birth control advocated by Malthus, and others which he would have condemned, have been applied so thoroughly in this country that if he were alive to-day he would be as outspoken in the denunciation of race suicide as he was in advocating the application of the checks which he grouped under the term "moral restraint." As Guillebrand has pointed out, the "principle" of Malthus still seems to reign supreme in the East.

The critics have said little about the hard facts of the situation in India, but at least two of them have made grossly misleading statements regarding the outstanding fact, which is the growth of population. One of them stated that this was by only 18.9% in 50 years. The census figures show an increase of 10.6% from 1921 to 1931, and a further increase of 15% in the next ten years. The increase in the past 25 years must, therefore, have been more than 30%. The actual increase between 1931 and 1941 was 50 millions.

Other facts are as follows: the recent famine in Bengal, where the population had risen from 50 millions in 1931 to 60 millions in 1941; the fact that girls in India begin to cohabit with their husbands at the average age of about 14, and give birth to their first baby at the average age of about 16; these estimates are based on the replies of 571 Indian doctors in rural areas to a questionnaire issued by me in 1931. Among the replies to other fact-finding questions is one in which the same doctors estimated that 60% of the people in their villages were either "poorly" or "very badly" nourished. This percentage would have been much higher if it were not that far lower standards of nutrition are regarded as normal in India than in this country. The only other fact that need be mentioned is the average duration of life in India; this is about half what it ought to be. The explanation of these facts will be clear to anyone who stops to think what conditions in England would be to-day if Oriental marriage customs had prevailed during the past hundred years, and if there had been no outlet in the shape of large-scale emigration.

Although the critics have belittled the gravity of the situation they have offered certain remedies. One of them points out that India could produce more than four times as much food as she does at present. Even if this fantastically optimistic estimate were accepted, it must be clear that people cannot be fed on what might, could, would, or should be produced but only on what can, and will, be produced. Another interesting remedy is suggested—namely, that in accordance with the terms of the Atlantic Charter an ample supply of food should be brought in from outside; the resultant freedom from want would promptly check the potential fertility of the people. The same remedy would have to be applied to China and other over-populated countries, so that this remarkable biological experiment would make heavy demands on the resources and on the altruism of the rest of the world. There is so little chance of the carrying out of this experiment that there is no need to speculate about what would happen if the natural fertility were not checked and if the survival rate were greatly increased.

Complete independence for India is another remedy; this has the great advantage that it will soon be available, but none of the aspirants to the political control of India has given any hint of the existence of a plan for dealing with the baffling problem, and although the Provinces, which have been autonomous for several years, have made commendable efforts in promoting medical relief and public health, none of them has shown signs of attacking the root of the trouble any more than did the British administration which was formerly in charge.

In view of the disquieting facts already mentioned the question will naturally be asked: What have medical men in India been doing to cope with the problem? One example of their action is that the medical research workers at four successive annual conferences from 1923 onwards unanimously adopted resolutions proposed by myself in which they pointed out that India was in a state of grave emergency, and they made an urgent appeal to Government to appoint a strong commission, chiefly non-technical, to investigate the causes of the wastage of life and the economic depression from which India was suffering. Similar representations have been made from time to time, but evidently those who expressed anxiety about the existing conditions and the future prospects of India were regarded as alarmists. At last an investigation has been started under the chairmanship of Sir Joseph Bhore, who is not likely to find the situation so satisfactory as some of Prof. Blacklock's critics seem to do.

The solution of the problem is easy to find: it lies in increasing the production of food and in regulating the rate of reproduction of children so as to maintain a satisfactory balance between food supply and population. It is in the application of the remedy that appalling difficulties will be encountered. There are many who believe that the people of India will never be prepared to make the necessary changes in their social customs. On the other hand, several educated Indians have assured me that if the people can be shown how to improve their conditions of life they will not allow religious or other prejudices to stand in their way. This, however, is a matter for Indians themselves to deal with; they will properly resent any dictation from outside. One thing is clear: most of the educated Indians welcome a frank discussion of the problem and take a more realistic view of the situation than Europeans seem to think.

The following tragi-comic incident related by Lieut.-Col. G. Waters in his privately published *Reminiscences* illustrates this point and shows that the population problem is not a recent development. During a period of famine, about 1875, the Minister of a South Mahratta State read an address to Sir Richard Temple, Governor of Bombay, "praying him to use his high character and transcendent ability to restrain, in some measure at all events, the inordinate aptitude of the people to increase the population." The Governor was very indignant and protested that he "would do everything in his power for the increase, and nothing for the diminution, of the number of Her Majesty's subjects." The Minister and his friends were amazed that His Excellency should have taken offence at so reasonable a request.—I am, etc.,

Hawkhurst, Kent

J. W. D. MEGAW.

### Nursery Schools and Classes for Young Children

SIR,—In view of the Education Bill the Executive Committee of the Medical Women's Federation wishes to draw attention to points connected with the provision of nursery schools and classes for children under the age of 5 years. As a result of reports from doctors having personal experience of the care of young children in many different districts of England, Scotland, and Wales, it has become evident that great importance must be given to the following considerations:

1. It is generally agreed that children between the ages of 3 and 5 years benefit from some form of community life, but serious doubt is felt as to the advisability of making extensive provision for children under the age of 3 years.

2. A nursery school forms a suitable environment for the majority of children in the 3-5-year-old age group provided: (a) that it is an independent unit with proper safeguards for the health of the children; (b) that the responsible staff have had special training and experience in the handling of these children both from the mental and physical aspects, and have

also had a grounding in practical hygiene; (c) that emphasis is laid on the fact that up to the age of 5 years the main consideration is health of mind and body, and that to ensure adequate health supervision there must be the closest co-operation between the nursery school and the various health services—i.e., child welfare centres, health visitors, school nurses, and doctors.

The nursery school can satisfy these desiderata, but we would deprecate any scheme of nursery classes. In these it is very doubtful that the right emphasis can always be secured, the class being a subsidiary element in the whole primary school in which the main interest must of necessity be centred on education rather than on health.—I am, etc.,

JANET K. AITKEN,  
President, Medical Women's Federation.

### Babies in Glass Cages

SIR,—To understand the reason for the new infant wards at the Birmingham Children's Hospital, Dr. H. C. Scott need only read the first sentence of the letter which immediately followed his in your issue of Feb. 19. This is, "I am in complete agreement with Dr. Margaret Dunstan in her opinion that under present conditions it is dangerous to admit infants into hospital." For many years it was my practice to admit infants into "open wards," and I have only too often proved the truth of that statement—an experience shared by every paediatrician. On the other hand, in the two to three years during which our new wards have been in use, I have had convincing evidence that our technique, if rigidly carried out, removes much of that danger and saves the lives of many infants. Am I right in assuming that because of what he considers "the ultimate consequences to mental health" of this treatment Dr. Scott would prefer that these children should die? As a matter of fact, he has not a shred of evidence of the results, good or bad, upon their mental health.

The journalistic interest in this experiment is the result of the Charles West Lecture recently delivered by me before the Royal College of Physicians. In that lecture I pointed out that the common infections from which young infants suffered were those affecting the gastro-intestinal and respiratory tracts; surgical sepsis, which Dr. Scott appears to think is the commonest form of infection, is an insignificant factor in infantile and neonatal morbidity and mortality.

Dr. Scott's description of the lives of these infants while in hospital is purely hypothetical, and to answer all his points would make this letter too long. I would, however, give him a cordial invitation to visit Birmingham and see how the system works. He would then not only be in a better position to criticize or praise but would find that the babies are given that "mothering" which is so essential either by their mothers or by a group of devoted nurses who strongly resent the suggestion that their work is "barely humane." Finally, a perusal of Prof. Garrod's paper on "Light as a Hygienic Safeguard," which appears in the same issue of the *Journal* as Dr. Scott's letter, might persuade him that there is something to be said for an extensive use of glass in hospital wards.—I am, etc.,

Birmingham

LEONARD G. PARSONS.

### Rehabilitation: Its Terms of Reference

SIR,—Dr. Jeaffreson Lloyd's letter on rehabilitation (Feb. 19, p. 264) is a refreshing commentary on a subject which, in its concept and connotation alike, has been accepted uncritically. There seems to be a grave danger of losing sight of the end to which it is designed, of mistaking the gymnasium for the factory, an artificial crowd of potential litigants for the normally integrated industrial community. Only in the factory can full psychosomatic readaptation be accomplished in the sense of restoring the human organism to its biological environment. The word "rehabilitation" itself has often been found difficult, even for a county court judge to pronounce, and for that reason alone should be abolished. But more important still is the suspicion that those who first made use of the term in its modern application were more technically than philosophically minded, and their chief concern was with the restitution of *habilitas* instead of regregation, the return to the *grex*.

Why is rehabilitation always confined to those surgical cases of occupational origin? True, we are about to witness the inception of an institution for the rehabilitation of the neurotic workmen, but what of the tuberculous, the psychotic, the dys-

peptic, the cardiac, the silicotic, and the ataxic? We must not deny occupational therapy to these; society must be prepared to receive back all its casualties, whole as well as maimed. All factories should, in proportion to their size and capabilities, aid in the re-education of those muscles and joints and the reorientation of those mental and moral attributes which enable a man to earn his living and take his place in the community. Larger units might find it necessary to create special departments with special conditions of administration, hygiene, and safety. Effective medical supervision for grading and nutrition would, of course, be indispensable.

Francis Galton defined energy as the capacity for labour, as the measure of the fullness of life, and in the darkness of his pre-Freudian mind conceived of fleas instead of libido. Of idle moments in animals he says that "in those blank times there is little for them to attend to besides their varied cutaneous irritations." Scientific advance in another field has given us benzyl benzoate, with the result that we have not even left our casualties anything to scratch, no stimulus to their atrophied muscles and no content to their blank minds. A new and wholly scientific national medical service might conceivably produce impressive therapeutic results and yet leave the gregarious instincts of the sick person unsatisfied. Like the ox of Damara who wanders from the herd "his glance is restless and anxious and is turned in succession to different quarters; his movements are hurried and agitated and he becomes a prey to the extremest terror." Human beings in like circumstances have an unfortunate predilection for looking inwards.

Rehabilitation, as at present understood, will, if unchecked, fall into the pre-Raphaelite error of attempting to solve an industrial problem by altering its terms of reference. The satisfaction of a native reaction tendency in creative art cannot be applied to the processing of materials. Otherwise, the result is something like William Morris's chairs, which pleased the aesthetic sense but to which no one could comfortably approximate his glutei. In other words, while the constructive instinct is of importance in modern industrial life, the gregarious instinct is more manifest. Everyone who is not moribund can and should work, but his capacity to do so and the salvation of his *quintessence* depends upon his spiritual environment. The answer to overproduction is the realization that an abundance of goods is an abundance of wealth, and that for the one to become the other requires the substitution of the human intellect for that of the fox among the hens.

Amnesia bought at a cost of thirty pieces of silver is not only betrayal of the victim but has pathological repercussions in the life of the community, such as political amblyopia, motor anaesthesia, and production palsies. True rehabilitation, therefore, is the essence of "positive health." Any scheme for a national medical service which ignores it in its wider implications will only perpetuate the custom of placating the blind and festering gods of human misfortune with 8-oz. bottles of libations. Meanwhile the vision glorious which has been vouchsafed to this generation will become a cold and pallid Platonic abstraction.—I am, etc.,

Dagenham.

H. WYERS.

### Methionine and Casein Digests in Liver Dysfunction

SIR,—There is a growing body of evidence from careful experimental work on animals to suggest that methionine and casein digests may be valuable therapeutic agents in diseases of the liver, and proof of similar action in man will be most helpful. Some of the opinions advanced by Prof. Beattie and his co-workers in their interesting article on carbon tetrachloride poisoning (Feb. 12, p. 209) are, however, contestable. They give four reasons for their opinion that their patient would probably have died had he not been treated with methionine and casein digest.

1. The large size of the dose (30 to 40 ml.). It is true that this is much larger than the therapeutic dose, and that deaths have occurred with smaller amounts, but there are cases on record in which survival has followed much larger doses. In 1935 Lehnher reported a patient who recovered after swallowing between 140 and 150 ml.

2. There was no vomiting until 45 minutes after swallowing. From this it is assumed that the poison had been completely absorbed. In Lehnher's case, however, vomiting was postponed for 3 hours.



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3. The speed with which the liver enlarged. In a recent investigation of "chronic" carbon tetrachloride poisoning<sup>1</sup> the certifying surgeon responsible for routine examination of the workers noticed that one man had gross enlargement of the liver during a bout of diarrhoea and vomiting that followed exposure to the poison. The finding was confirmed on admission to hospital, where the liver rapidly returned to its normal size and the patient recovered without ever developing jaundice.

4. The delay of 19 hours between the accident and the institution of treatment. Both the cases cited above had no specific treatment. Thus the patient might well have recovered without the help of methionine and casein digest.

Prof. Beattie and his colleagues suppose methionine to have been effective because they believe that "the liver disturbance induced by carbon tetrachloride is an abnormal metabolism of methionine and related compounds." It is not at once clear from the biochemical data how they reach this belief. They appear to base it on a small transient negative nitrogen balance and a "failure to excrete the major portion of the methionine sulphur as oxidized sulphur within 24 hours." It is probably unfair to assume that renal function is unaffected in a case of carbon tetrachloride poisoning, and a temporary derangement may have influenced the nitrogen and sulphur excretion in their case. In addition the negative nitrogen balance may have been due to the very low protein intake during the first two days (Oct. 2 and 3) and to the fever on Oct. 3. The diuresis observed on the days following the methionine administration may also have complicated the study of the nitrogen balance, as a diuresis tends to sweep non-protein nitrogen from the blood stream into the urine. That this may have occurred in their patient is suggested by the fact that there was no change in level of the non-protein nitrogen in the blood despite the fact that the blood amino-acid rose to 12.7 mg./100 ml. on Oct. 3.—We are, etc.,

ALICE STEWART.  
J. P. O'BRIEN.

Oxford

## REFERENCES

- 1 Lehnbert, E. R., *Arch. Intern. Med.*, 1935, 56, 100
- 2 Stewart, A., and Wills, L. J., *Brit. J. Industr. Med.*, 1944, 1, 11

## Penicillin or Cyllin?

SIR.—In your columns attention has been drawn frequently to the merits of the new remedial agent penicillin. That with it we are better able to combat certain inflammatory conditions cannot be denied. Unfortunately, however, it is impossible yet to obtain it for the treatment of all the cases for which experiment suggests it might be helpful, and its difficulty in preparation makes it an expensive treatment.

After carefully reading the literature in this and other medical journals I am impressed by the fact that for local application to many of the conditions penicillin offers no advantages over cyllin. This is a coal-tar derivative whose effective agent may well have been laid down during the disintegration of its vegetable antecedents. It is miscible in water in all proportions, it does not coagulate proteins, consequently does not produce the superficial necrosis which has been noted in the local application of penicillin and other expensive preparations. It is non-corrosive. It is absorbed to a beneficial extent through the intact skin and is a most effective skin disinfectant. It has a Rideal-Walker coefficient of 18-24. It is cheap and easily obtained. Respecting the latter I would refer to your leading article on skin disinfection (Feb. 5, 1944, p. 188) where it states, "Tests by this laborious method award first prize to tincture of iodine followed by alcohol, and second to alcohol . . . And let it be observed that iodine and spirit are both in very short supply in this country at present; we are in fact asked not to use either when anything else will serve." The preparation of the skin for surgery by thorough cleansing with 4 teaspoonfuls of cyllin to a quart of water will ensure freedom from sepsis. I have used it successfully for many years when there was a liability to skin injury while handling grossly infected material and for the cleansing of wounds sustained during such activities. Used in the water in this proportion for the thorough cleansing of earth-soiled abraded surfaces of the ragged wound, using it in a jet from a large syringe or an elevated douche-can for washing out the deep recesses, will also prevent sepsis. I should regard it as ideal for the cleansing of war wounds.

Distinct from many of the preparations used, because it does not coagulate proteins, it can disinfect material beneath the

surface and prevent the development of sepsis. It is well known as an efficient disinfectant for infected stools. Even when used neat it is not a corrosive.

The proof that it can be absorbed by the skin and used in the treatment of underlying sepsis can readily be obtained by rubbing the neat fluid into the skin over recently infected hair follicles or the early boil. The focus loses its pain and tenderness, the swelling gradually diminishes, and the lesion fades away. I have found it particularly useful in the treatment of early boils at the back of the neck, in the lower nares, and in the external ear. Though the neat fluid or cyllin in olive oil does not burn or cause sensation, the application of water to the surfaces treated will cause a slight burning sensation followed by a localized erythema, but nothing more. Used neat under the nail at the site of an early septic focus it will abolish the pain and throbbing and abort the sepsis. When the lesions have progressed beyond this I have found that repeated immersion of the infected finger in a hot solution of 1 teaspoonful to a quart of water during the day with applications of hot fomentations for the night, using a similar strength, have removed the necessity for surgical intervention. Used locally in this strength, as suggested for penicillin in the septic focus which has been opened, I should expect it to be equally efficacious. Some time ago I saw its cruder preparation used for washing out the uterus of a cow, under conditions of gross infection, from which an impacted full-term calf had been removed bit by bit after multiple insertions of the hand to fix a rope for extraction and for manipulating the wire saw. No indication of sepsis followed, and the cow made an uneventful recovery and exhibited little difference to normal parturition.

Patients referred to me for x-radiation treatment of staphylococcal skin infections of the beard area and other hairy surfaces I have instructed to keep the area clean by the use of 1 teaspoonful of cyllin to each quart of all washing water, and the constant excellent response has always appeared to me to be better than I have found in so short a time when x-radiation alone was given. Infected mucous surfaces as in balanitis respond equally readily to similar treatment. With so effective, harmless, and cheap a preparation would it not be reasonable to use it instead of the expensive penicillin, sulphanilamide, sulphathiazole, alcohol, and such-like preparations for the cleansing and treatment of the skin and its wounds?—I am, etc.,

Birmingham.

JAMES F. BRAILSFORD.

## Teaching of Anaesthetics

SIR.—In spite of great progress in technique and in diminution of patients' discomfort, anaesthetics to-day have two important defects that must be remedied: they are the persistent mortality rate and ineffective teaching. Can anyone doubt that the former is largely due to the latter? Most true anaesthetic fatalities are, as Hewitt insisted years ago, preventable. They happen therefore mostly, not at the hands of those who give most anaesthetics—the experts—but at the hands of those who give fewest—the occasional anaesthetists.

As things are, and probably as they will long be, many anaesthetics all over the country must be given by the occasional anaesthetist. There are not nearly enough experts to go round. It is the business of the medical schools to make this occasional anaesthetist—the general practitioner—a safe administrator. At the present time he is less likely to be so than he was thirty years ago. This is no fault of the teaching anaesthetist. If he does his best for the surgeon and the patient in the theatre he cannot teach the student anything that will help him as an occasional anaesthetist. For this purpose he must be made safe and reasonably competent with the simple methods which alone will be at his disposal.

One suggested solution of the problem is that the student should be much more than at present taught in the casualty operating rooms and in the dental departments. This might certainly help, but the great need, it seems to me, is that the present serious and disappointing state of affairs should be effectually brought to the notice of the medical school committees in all our great schools. They would not, I believe, sit down under the reproach which can now be levelled against them if they fully appreciate its existence.—I am, etc.,

Isleworth.

J. BLOMFELD.

## V.D. and Professional Secrecy

SIR,—With reference to the article entitled "The Modern Treatment of Gonorrhoea in the Female" which appeared under my name in the *British Medical Journal* (Jan. 8, p. 51), there appears to be some doubt as to whether, in the case of a girl under 21, it is always justifiable to tell the parents. Naturally, of course, the consent of the girl should be obtained if possible, but if it is refused it may be that disclosure to the parents would be a breach of professional confidence.

It is generally agreed that a girl living with her parents is under their control, provided she is under 21; where, however, she is living away from them and/or is 18 years old or more and capable of understanding the implications of the disease from which she is suffering, the doctor should, it appears, not communicate the fact that she is suffering from V.D. to the parents against her wishes.

Much, of course, depends on the circumstances of the case, and that is why in my original article I used the words, "In the case of a girl under 21 the parents should be told if the circumstances demand it"; what I had in mind, more especially, was the young girl who is promiscuous and who is in need of care and attention.

I am not a legal expert and should be very glad to hear the opinions of those who are.—I am, etc.,

The War Office, London, S W 1

T. E. OSMOND.

Our Medico-Legal Correspondent writes: In law a person under 21 is not legally competent, and can only sue or be sued in the name of his next friend—usually the parent or guardian. Although a minor could sue a parent in a proper case, in the case supposed by Brigadier Osmond the father is presumably the legal guardian of the girl and would have a right to know any facts on which he ought to take action in the girl's own interest. Therefore the doctor would probably not be breaking any duty owed to the girl if he disclosed her condition to her parents. The whole question of what, if any, duty of secrecy a doctor owes to a patient is quite obscure, and the doctor had far better be guided by his professional conscience. If he does so he is not likely to fall into any legal difficulty. Perhaps the basic question here is, "Would disclosure to the parents be in the best interests of the girl?"

## Regulation 33B

SIR,—Your leading article on Regulation 33B (Feb. 12, p. 223) was, I thought, disappointing. It tended to dismiss the complaints of the voluntary workers who operate it and should know, and was concerned to make excuses for the regulation itself, ignoring the main issue—the treatment of all V.D. cases.

The futility of the regulation you have adequately pointed out: "The number of patients and contacts affected by the regulation is still lamentably small." Of course it is, and it will continue to be so until we make up our minds to grasp the nettle firmly and produce a regulation which will bring V.D. into line with other diseases that are considered sufficiently a public menace as to make them notifiable. The reason for the failure of 33B will be obvious to anyone who has worked in a treatment centre. Patients are, of course, questioned as to the source of infection, and it is rare indeed for a man to admit to any precise knowledge, although women are sometimes more outspoken; the most one can get is a vague promise that the suspected consort will be urged to come up for investigation. So, in the absence of any record of the identities of infecting consorts, how can it be possible, except in rare instances, to apply Regulation 33B to any of the large number of untreated carriers?

If we are honestly concerned about V.D. it should at once be made an offence to have the disease untreated. This would provide for two types of notification: in the first place a private one to the doctor or clinic, thus preserving the present confidential nature of the service; in the second, a public one to the medical officer of health in the case of the recalcitrant and neglectful. This course has the added advantage that private doctors would have to make a return of the numbers they treat, thus giving a much more exact figure of incidence. Further, it would enable us to deal, among others, with the large class who default while still uncured—the husband who

infects his wife while refusing treatment for himself, and those parents who refuse or neglect to have children treated who are congenitally or accidentally infected. The threat of publicity and penalty would bring for investigation large numbers whose consciences, in spite of lack of definite symptoms, are not quite easy; recent propaganda has certainly had its effect, but it does not touch the "don't care" and "it can't happen to me" classes of carrier.—I am, etc.,

London, W. I.

KEITH DUFF, F.R.C.S.

SIR,—Your leading article (Feb. 12, p. 223) deals with Regulation 33B in practice and deplores criticism by lawyers and voluntary workers on the ground that it is unreasonable, although it admits that the criticism that the regulation covers such a minute class that it is practically ineffective is "more reasonable."

In this connexion my committee notes with interest that the objections raised against Regulation 33B by this association when it was introduced in November, 1942, have been justified not only by the criticisms of lawyers and voluntary workers but by the latest statement on the working of the regulation by the Minister of Health in the House of Commons on Feb. 4. He reports that 213 men and 3,131 women had been reported as alleged sources of infection by persons under treatment for V.D. Of this total, 200 men and 2,907 women were the subject of one report only, leaving a total of 4 men and 224 women who were presumably the subject of the two (or more) reports needed to bring them within the scope of Regulation 33B. But of this total of 228 persons only 2 men and 150 women have been brought (compulsorily or voluntarily) under treatment, leaving a balance of 2 men and 74 women who have for some reason evaded treatment. A few women have been imprisoned or fined; a number, according to the Minister, are persons who cannot be traced. Are the remainder uninfected persons who have been victims of careless or malicious accusations?

In any case it is obvious that Regulation 33B does not facilitate to any appreciable degree the tracing of contacts. The majority of these who have been brought under treatment have been reached by the usual methods employed by doctors and workers in any efficiently run clinics long before the introduction of Regulation 33B.

The article, while deploring the lack of results, confronts the legal and medical critics of Regulation 33B with the argument that it must be accepted because it belongs to a class of law hitherto unknown in this country—that is, "administrative law"—which has come to stay. Actually there is growing criticism, both in the House of Commons and the country, of this type of legislation. There is no indication that it will be accepted with complacent acquiescence as a permanent part of our legislative system. The late Lord Chief Justice Hewart was acutely apprehensive of this growing danger to the ordinary citizen, and foretold "the formidable consequences" which inevitably result when Government Departments place themselves "above the sovereignty of Parliament and beyond the jurisdiction of the courts" (*The New Despotism*, 1929). There are signs that this warning from a great lawyer has not fallen on deaf ears.—I am, etc.,

E. M. TURNER.

London, S W 1 Secretary, Association for Moral and Social Hygiene

## Vaginal Ulceration and Vitamin C Deficiency

SIR,—I was interested in the article on this subject by Drs. Lawlor and Richardson (Feb. 19, p. 254). In their discussion of the two cases cited they said smears and cultures revealed no evidence of gonococcal or treponema infection, but they did not indicate whether or not they had excluded the presence of *Oidium albicans* of thrush or *Trichomonas vaginalis*, the latter of which I found to be present in 148 out of a series of 408 consecutive patients complaining of vaginal discharge at the Simpson Maternity Pavilion of the Royal Infirmary, Edinburgh, and who exhibited punctate haemorrhagic spots of the vagina and introitus with irritation.

A cure in these cases, showing absence of the parasite, was associated with reappearance of Döderlein bacilli and of the normal amount of deposition of glycogen in the epithelial cells, together with a return of the pH from between 5 and 6 to the normal pH of the vagina of between 3.8 and 4, as demonstrated by Liston (*Brit. J. vener. Dis.*, 1940, 16, 113).

It may be that deficiency of vitamin C causes alteration in these normal conditions of the vagina which would allow of the growth and development of such a parasite. Investigation of this might prove useful owing to the intractable nature of such an infection.—I am, etc.,

Perth

F. B. CUTHSHAM

### Induction of Labour by Separation of Membranes

SIR.—The memorandum by Mr. D. Chalmers Wiseman (Feb. 12, p. 221) concerning induction of labour by digital separation of membranes contains, I think, too many controversial statements, put forward as facts, to be allowed to pass unchallenged. To deal with them as they occur:

1. "Caesarean section . . . limits the number of pregnancies to three." This is definitely not so with the lower segment operation. I have seen a patient have her fifth, and have personally carried out a third without sterilization.

2. "Surgical induction by rupturing the hind-waters contraindicates Caesarean section." With careful technique and the use of Drew Smythe's catheter, this is not so. I have several times carried out Caesarean section after this induction, with neither qualms nor untoward results. Surely this operation was devised so as not to rule out subsequent Caesarean section?

3. "In cases of pelvic contraction in which bimanual examination is being carried out at weekly intervals . . ." Is this a common practice? Surely once, or occasionally twice, is sufficient. If there is as much doubt as all this, is not x-ray pelvimetry strongly indicated?

4. "Medical induction is started the same day." Which induction has in fact induced labour—medical or separation of the membranes?

5. ". . . Labour failed to come on within a period of ten days in only three." If Mr. Wiseman allows ten days' grace he will return good figures with almost any method of induction. I consider an induction has failed if labour does not commence within seventy-two hours.

Lastly, I am not decrying separation of the membranes. I employ it along with Drew Smythe's catheter in all cases when the dilatation of the cervix permits.—I am, etc.,

Stockport

WALTER CALVERT

### Heroin and Pethidine during Labour

SIR.—I was much interested in the letter of Dr. James Ross (Jan. 8, p. 59) on the use of heroin in labour, and the two recent articles on pethidine as an obstetric analgesic (Feb. 5). I have recently been using either heroin or pethidine in conjunction with a mixture of pot. brom. and chloral hydrate for practically all the patients admitted to hospital under my care, with excellent results. I have, like Dr. James Ross, never found that heroin had any ill effects on the infant, even though delivery followed very shortly after an injection, nor have I found any ill effects following the use of pethidine. I have not, however, given either heroin or pethidine as a routine to every patient admitted to hospital, as not every patient seemed to require it, and occasionally an injection of morphine or omnopon and scopolamine seemed preferable.

The procedure which has been adopted as a routine is as follows. As soon as labour pains have been established, but before the patient is in any way distressed, a dose of pot. brom. and chloral hydrate, of each 30 gr., is given and the patient encouraged to relax and sleep if possible. When the pains become more severe and the patient shows signs of becoming distressed either the pot. brom. and chloral is repeated or heroin 1/6 gr. or 1/12 gr. is given, according to the condition of the patient, degree of severity of pains, degree of dilatation of the cervix, and whether she is a primipara or a multipara. This may be sufficient with or without the use of Minnitt's gas-and-air apparatus at the end of the second stage, but if the first stage is prolonged more than 3 to 4 hours after the initial dose of heroin, then either heroin 1/12 gr. is given or the pot. brom. and chloral is repeated. As a rule with this medication the patient sleeps through most of the labour, and on being questioned next day has very little recollection of what she has been through. For the past few months pethidine has been used in place of heroin: 2 c.cm. (100 mg.) pethidine has been given intramuscularly in place of heroin 1/6 gr., and 1 c.cm. (50 mg.) pethidine in place of heroin 1/12 gr. The patients do not sleep after pethidine as they do after heroin, but they are, as a rule, drowsy after the pot. brom. and

chloral and remain relaxed and quiet. We have, however, continued to use heroin at night to ensure sleep and for nervous and apprehensive patients.

It is difficult, I think, to state exactly a routine method of medication to be given in every case, because individuals vary greatly, both with regard to their appreciation of pain and the rapidity or otherwise of the progress of labour, but the procedure outlined above does give very good results. In my opinion the value of these drugs lies mainly in their sedative and analgesic action rather than in any other property they may possess. To anyone who has spent much time in the labour wards it is obvious that mental and physical exhaustion of the patient prolongs the first stage of labour, and I am sure that if drugs were used in labour more freely and more adequately the bogy of the "rigid cervix" would disappear almost entirely, and many more trial labours would end successfully; also that the incidence of instrumental deliveries would be reduced. I cannot, however, agree with Dr. James Ross that heroin should be used by midwives in domiciliary practice, at the present time at any rate, but I would urge the greater use of a mixture of pot. brom. and chloral hydrate, which, even by itself, is most useful and effective.—I am, etc.,

MARGARET VENTERS,  
Obstetric Consultant, Barrow-in-Furness.

### Infant Mortality in Scotland

SIR.—Your correspondent S. F. Markham, M.P., draws attention to the fact, shown by Table VIII of the Beveridge report, that the average Scottish household of 3 to 5 persons spends 13% less on coal, gas, or electricity than the same household in Southern England. From this he deduces the entirely fallacious conclusion that less coal, etc., is actually consumed in Scotland, and that it is considered heroic and spartan to be cold. A glance at the table referred to will show that the amount spent on coal depends on the price, and the price on the distance from the coalfields. The main portion of the population of Scotland is gathered round the mining areas—Lanarkshire, the Lothians, and Fife—where, compared with the South of England, transport costs to the consumer are low indeed. The same holds good of the mining areas in England and Wales.

As shown by the table the amount spent by the average household in the north and north-east of England, and in Wales, is less than in Scotland, as would be natural in the more homogeneous and restricted areas. It would be strange indeed if households in the mining areas consumed the least coal.—I am, etc.,

Lancaster

R. T. RANKIN.

### Prevention of Goitre

SIR.—My attention has been drawn to a recently published memorandum of the Goitre Subcommittee of the Medical Research Council entitled, "Endemic Goitre in England: Argument for Preventive Action." This memorandum draws attention to the great prevalence of goitre in England and strongly urges the adoption of a national policy of adding a trace of iodine to all common salt consumed in the country.

Of course I am gratified to learn that our expert advisers have at long last recognized facts which I have been continuously stressing for the past fourteen years. In 1933 I published an article on the "Prevention of Disease," concluding it with these words: "The leading nation, from the point of view of health, will be that which realizes the value of salt iodization and puts it into general practice." More recently, however, I have recognized the fact that the wholesale introduction of iodine-containing salt in the diet of the whole community is a somewhat crude method of correcting the evident deficiency. I have practised a simpler, surer, more accurate method of accomplishing this object which is free from certain drawbacks and rests on an entirely voluntary basis.

The primary cause of goitre is iodine deficiency, and since this element is essential to normal thyroid function and, furthermore, to that of the endocrine system in general, it follows that its persistent deficiency is liable to pave the way to the various manifestations of disease in general; moreover, it becomes evident that most of our people are functioning at a lower level of real health than that of which they are

inherently capable, and that from conception onwards. We know that simple goitre *per se* is but rarely associated with serious symptoms, but, nevertheless, it is indicative of an underlying constitutional disorder affecting the harmonious working of the endocrine system, and so goitre may be looked upon as a "key disease" and iodine as the "key element."

Many years ago I noted the marked and increasing prevalence of goitre in our midst, and observed the great value of minute doses of iodine in the prevention and treatment of acute and chronic infections and of constitutional disease in general and its beneficial effects upon the general health—its value as a "food" rather than as a drug. During the past fourteen years I have published numerous articles on iodine deficiency and its deleterious effects upon the health of our people. On several occasions stress has been laid upon the great eugenic value of an iodine supplement to expectant mothers to protect them from miscarriage and puerperal complications and to ensure that the offspring be not handicapped in physical or mental development.

I am of opinion that iodine deficiency is the primary cause of goitre and thyrotoxicosis—of defective natural resistance to acute and chronic infections, and of constitutional disease in general in its various manifestations, including those two great killing diseases—cardiovascular degenerations and cancer. Apart from malnutrition due to insufficient nourishment or to a very restricted dietary—the cause of such diseases as rickets, scurvy, etc.—one may state that an ordinary rational diet has but one fault—namely, its evident iodine deficiency—and if this be corrected there is no need to worry about any mineral or vitamin supplement.

In the near future one may hope that medical attention will concentrate on the prevention of disease rather than merely on its treatment—on health rather than on disease.

Penarth, Glam.

W. MITCHELL STEVENS, M.D., F.R.C.P.

### Periarteritis Nodosa

SIR.—Dr. MacKeith, in his report (Jan. 29) upon three cases of periarteritis nodosa, leaves one with the impression—indeed the subtitle of the article implies—that the condition described is a distinct clinical entity. Would it not be more correct to say that its presence should always be regarded as a manifestation of an underlying hyper-ergy? Its association with rheumatism seems now to be well established. Neale and Whitfield (1934) discuss the clinical manifestations of periarteritis nodosa and conclude that it may be a variant of acute rheumatism; while Middleton and McCarter (1935) review the literature in some detail and consider the suggestion that it should be placed in the rheumatic group to be warranted.

My interest in the condition has been aroused by the observations of Rich (1942), and Rich and Gregory (1943) upon which you commented in your issue of May 15, 1943. Rich originally reported the study of material from several fatal cases which had received before death (a) serum alone, (b) serum + sulphonamides, or (c) sulphonamides alone. In all the histological picture was that of a periarteritis nodosa; and he suggested that the latter might well be the essential pathological lesion in those who had become sensitized to such materials. Later, in collaboration with Gregory he was able to reproduce the lesions in experimental animals. Clinically, there can now be little doubt that some of the "side-effects" of the sulphonamide series are of a "sensitization" type; and the ability to reproduce the rash and fever with a single dose of the offending drug in an individual who has shown these reactions is well known. I therefore interested me to find that in MacKeith's third case a biopsy performed on admission showed no lesion, but a repeat examination one month later after a course of sulphathiazole showed the typical histological picture. Further, all of his patients had a past history of chronic cough; it would have been valuable to have elicited precise information that this had never been treated with a sulphonamide. It would be a pity if such occasional findings were to be interpreted as raising yet another "bogy" to frighten the clinician against effective chemotherapy; and that is not the purpose of my letter. It is surely necessary to emphasize that periarteritis nodosa may occur as a result of a variety of exciting causes; that the reaction, it would seem, can frequently be related to a state of hyper-ergy on the part

of the patient; and that chemicals of the sulphonamide series may be incriminated.

One final consideration is worth recording in this connexion. It has been found that the sulphonamides are not only ineffective but may indeed be harmful when administered to cases of acute rheumatism. Can such an observed clinical result not perhaps be correlated with, on the one hand, the association of rheumatic disease and periarteritis nodosa, and, on the other, that of periarteritis nodosa and drug-sensitization?—I am, etc.,

THOMAS ANDERSON,

Annicland, Glasgow.

Physician-superintendent, Knightswood Hospital.

### REFERENCES

- Neale, A. V., and Whitfield, A. G. W. (1934). *British Medical Journal*, 2, 104.  
Middleton, W. S., and McCarter, J. C. (1935). *Amer. J. med. Sci.*, 190, 291.  
Rich, A. R. (1942). *Johns Hopk. Hosp. Bull.*, 71, 375.  
— and Gregory, J. E. (1943). *Ibid.*, 72, 65.

### Exomphalos

SIR.—My friend Mr. D. B. E. Foster (Feb. 12, p. 230) emphasizes the value of early operation, and is to be congratulated on the successful result in two of his three cases of partial exomphalos. He apparently regards operation for complete exomphalos, however, as futile, and is supported in his opinion by the references he quotes and a statement in a recent edition of a well-known textbook that "exomphalos is merely of pathological interest." That this is not invariably the case, however, is shown by the one and only example on which I have operated. The condition was complete and the liver outside the abdomen. Operation was performed without anaesthetic when the baby was only twenty minutes old. The child survived, and when last heard of was 6 years old and healthy. This case was reported in the *British Journal of Surgery*, 1941, 29, 37, and I draw attention to it here merely to encourage surgical effort in what may at first sight appear to be a hopeless condition.

"The abyss is worth a leap, however wide,  
When life, sweet life lies on the other side."

—I am, etc.,

LAMBERT ROGERS.

### Tonsillectomy in Children

SIR.—In your issue of Feb. 19 (p. 268) Mr. Carew Shaw has written an excellent letter on this subject. My experience at a provincial hospital endorses his findings.

During the past 6 months I operated on 25 children, ages ranging from 5 to 9 years, who had had their tonsils and adenoids removed under ethyl chloride anaesthesia—the guillotine being employed for the tonsils. These cases were seen by the school doctor, who recommended removal of the tonsils and adenoids, and were admitted to the hospital under the county council. In every case which was returned to the E.N.T. department by the local practitioner, the patients were suffering from nasal catarrh and obstructed nasal breathing; in 10 of these cases there was impaired hearing, and 4 were suffering from bilateral otorrhoea. On examination, the anterior pillars of the fauces were damaged in 22 instances, and tonsillar remnants were present in 12. In all 25 adenoid tissue was found in the nasopharynx.

On Mr. Norman Patterson's suggestion I continued the investigation on the weight of adenoid tissue removed in cases which had been previously operated on—using his curette to remove the lymphoid tissue from the region of the Eustachian cushion (see *British Medical Journal*, Nov. 28, 1936). The largest mass of adenoid tissue removed weighed 6.5 g., and the average weight was approximately 3.5 g. The weighing took place immediately after operation. In the cases with impaired hearing and otorrhoea, adenoid tissue was found in the fossa of Rosenmüller. Following operation patients with impaired hearing soon recovered this function. Of the 4 cases suffering from otorrhoea, the discharge became negligible in 2 within 10 days; the other 2 were operated on for drainage of the mastoid. In every instance on examining the nasopharynx at operation the Eustachian cushions were found to be hypertrophied.

I agree with Mr. Carew Shaw that little reliance can be placed on articles which have appeared in various medical journals, "purporting to show that tonsil and adenoid removal in children is at best useless, and even may be harmful." As operations are so often incomplete, statistics are founded on quite unreliable material. If I had followed the advice of these articles I doubt whether I should have had the tonsils and

adenoids removed from my own child. The tonsils and adenoids, however, were removed in an efficient manner by dissection and complete removal of all adenoid tissue. Since operation my child has put on weight, does not snore at night or suffer with nasal catarrh; her appetite has improved; but she still catches cold—the colds when they do occur are of a trivial nature, lasting 3 to 4 days. Recurring attacks of cervical adenitis accompanied by toxæmia and difficulty in swallowing are now things of the past.

I am in complete agreement with Mr. Carew Shaw when he says that "all the tonsils and nothing but the tonsils" should be removed, and that the adenoids should be removed without damage to the Eustachian tubes. I would like to stress that in my experience the "smash-and-grab" operation, which often results in incomplete removal of the tonsils, frequently accompanied by damage to the faucial pillars, coupled with very partial removal of the adenoid tissue, is much to be deprecated. —I am, etc.,

Royal Bucks Hospital, Aylesbury

S. W. G. HARGROVE.

### Doctor and Patient

SIR.—One man's editorial is another man's red rag, but humanitarians will be comforted by the thought that, in Coventry at any rate, even in wartime, it is still possible to obtain plenty of "charity" (in the shape of other people's money) and holidays-while-you-wait in return for the nimble shilling. Meanwhile let us hope that the Editor is not unduly depressed at receiving a lesson in the use and meaning of the King's English, to say nothing of a castigation for stating the truth.—I am, etc.,

Highams Park

FREDERIC SANDERS.

SIR.—In a vital industrial centre such as Coventry, the venue of Dr. K. E. Barlow's philanthropic labours (Feb. 19, p. 265), one hopes that the local doctors do not view the vexed question of absenteeism merely as a matter of science v. charity. Patriotic sentiment is wanted—an eventuality foreseen by the "Wandering Minstrel" of operatic fame, but a factor omitted from Dr. Barlow's admirable dissertation. The civilian practitioner must feel that he can do little directly to further the war effort, but it was unconscionable of him not to use his influence (if any) for the purpose of getting convalescent patients back to work as soon as possible.

Dr. Barlow's indictment of the "industrial set-up" may be unexceptional on every count; it is largely a question of political persuasion. Our cities are hideous; life in great centres of population probably fails to develop the best in man, and until recently there were over two million unemployed. But should not the inevitable attack on these "Satanic mills" be postponed until they cease to be the anvils of Vulcan which are still forging weapons for the defence of civilization?

Women will never be psychologically adjusted in large factories, but we trust their sojourn there will be short. For the most part they accept the present phase in a philosophic spirit, but too many are ready to ascribe a transient cold to the smoke and metal dust of the factory, and to seek to enlist the doctor's aid in getting out, temporarily or permanently. Even if one must eventually accede to the demands of these importunate widows, matrons, and spinsters there is no harm done by gently pointing out that the atmosphere of a battlefield can be smoky on occasion, and perhaps charged with even more harmful metallic particles. I have known it impress, but not often.

The man or woman who seems to regard six weeks as an average period of incapacity for a common cold is the more usual problem. Here again tactful exhortation on the same lines may be indicated, for sympathy with the patient must be counterbalanced by sympathy with the rest of mankind—the Forces, our Russian ally, the occupied nations, etc. Does one inadvertently pander to this tendency by labelling the smallest of colds with the grandiose title "coryza"?

Science reigns supreme in the realm of organic disease: this can usually be accurately measured and rationally treated, no two surgeons or physicians disagreeing over much. "Functional elements" form a vast hinterland, mainly uncharted and left

to the G.P., and here his manner of dealing with cases will largely reflect his personality. Dr. Barlow is rejoiced to find the G.P. so kind-hearted by nature that scientific justice is liberally tempered by charity. We may trust they are also public-spirited men and women, and that the charity is tempered in its turn by wider considerations.—I am, etc.,

Birmingham.

PETER PARRY.

### A Health Magazine for the Layman

SIR,—Dr. Joseph Parness's comments (Feb. 19, p. 270) are timely, and many doctors, and still more patients, will be in agreement with his outcry against so-called "health magazines" and his plea for a proper journal for lay reading.

There must be others besides myself who look forward to the arrival each month of *Hygeia* (the health magazine of the American Medical Association), but regret that we have to send to America for a periodical which gives our patients what they want. The American Medical Association realizes the demand for reliable instruction on health and disease, and appreciates also that there are many people who have a genuine interest in such matters, an interest which is not based on morbid curiosity. My own copies of *Hygeia* pass through many hands before they reach the waiting-room table, and thereafter are sent on to others whose chief request previously was for old copies of the *British Medical Journal*. While *Hygeia* is produced on typically American lines, its articles are contributed by properly qualified people, the style and subject-matter are appropriate, and the information given is reliable.

That there is a demand for knowledge and guidance on health and disease is shown by the avidity with which the average layman reads the pseudo-health journals and articles in the popular press. I am fully aware that there are some reasons against the publication in this country of such a journal as *Hygeia*, but a time has come when steps should be taken to satisfy the acknowledged appetite of the laity by providing a periodical, officially sponsored, attractively produced, written in popular style, and giving accurate information of topical interest. Such a magazine must help the American reader to understand his body, keep well, tolerate disease with less apprehension when it overtakes him, contribute to national health, and, by rendering the patient more enlightened, help his doctor.—I am, etc.,

Leicester.

F. S. AIREY.

\* The Central Council for Health Education publishes two journals for the layman: *Health Education Journal*, a quarterly (1s. 6d. per copy, 6s. per annum, post free), which is of special interest to those concerned with health education; and *Better Health* (2d. per copy, 3s. per annum, post free), a monthly, containing a variety of articles on health topics of interest to the general public.—ED., *B.M.J.*

### Trilene Hazard

SIR.—Dr. H. Joules invited me to the Central Middlesex Hospital to help to investigate the cause of cranial-nerve palsies which developed in some patients following general anaesthesia. These, I learn, are reported in this issue of the *Journal* by Humphrey and McClelland.

R. Milton and J. Graham, working in the laboratories of this department, have shown that dichloroacetylene is the only substance formed in any quantity when trichlorethylene is passed over soda-lime, as evidenced by the isolation of the "dibrom" derivative, which has a well-defined boiling-point—172° C. With K. M. A. Perry they have performed experiments on rats. Two control rats were placed in a chamber and were anaesthetized by sucking trilene through it for thirty minutes; they both recovered. Three others were similarly exposed to a trilene-dichloroacetylene mixture for 30 minutes, and all three died in convulsions after being removed. Further experiments and histological studies are being carried out.

These experiments support the evidence of Humphrey and McClelland that trichlorethylene reacts with soda-lime to form a toxic substance, dichloroacetylene. Trilene should therefore never be used in a closed-circuit anaesthetic apparatus.—I am, etc.,

DONALD HUNTER.

Department for Research in Industrial Medicine,  
London Hospital, E.1.



## First Aid for Thermal Burns and Scalds

SIR.—A forthcoming issue of the *British Journal of Industrial Medicine* will contain a report by Mr. T. Gibson, Prof. J. P. Todd, and myself on an investigation recently carried out at the Glasgow Royal Infirmary on behalf of the Medical Research Council. We had been impressed by the absence of any agreed policy with regard to first aid for burns, and we have attempted to find a satisfactory basis for such a policy. The experimental data can await publication within a few weeks, but, in view of the recent renewal of enemy activity against our civilian population and the likelihood of a large number of burning injuries, it seems expedient to submit the conclusions we have reached. They are, briefly, as follows:

1. In all severe or extensive burns no first aid should be attempted, other than keeping the patient warm and giving morphine, if required. Immediate removal to hospital is the first consideration.

2. Small burns which are accessible without removal of clothes—e.g., of the hand or forearm or head—should be covered with a recently laundered clean towel or, better, if it is available, with a sterile cloth. (Industrial premises or private houses in areas likely to be attacked by incendiaries should keep a supply of such cloths, previously baked in an oven and stored in a tin.) The burn thus covered should be sent without delay to the factory surgery or a hospital or a private doctor.

3. When quite superficial small burns are treated at home, or when, in the case of more severe burns, their full-dress treatment cannot be carried out without considerable delay, the burned area and the skin around should be freely smeared with a water-soluble antibacterial cream. The cream which is recommended ("Glasgow No. 9"), on the basis of extensive clinical and bacteriological trials, has the following formula:

Cetyl trimethyl ammonium bromide	.. .. .	1.0 g.
Sulphanilamide	.. .. .	3.0 g.
Castor oil	.. .. .	25.0 g.
Beeswax	.. .. .	1.8 g.
Wool fat	.. .. .	1.8 g.
Cetyl alcohol	.. .. .	5.0 g.
Glycerin	.. .. .	10.0 g.
Water	.. .. .	52.4 g.

**Preparation.**—Melt the castor oil, beeswax, and wool fat and cetyl alcohol at as low a temperature as possible. Dissolve the CTAB in the water with the aid of heat and mix with the oil, etc., at about 60° C. and stir till set. The sulphanilamide is then rubbed up with the glycerin and incorporated, with thorough mixing, in the cream. A "peerless mixer" with bent arm at slow speed has given the best results, but it is quite possible to make the preparation by hand, although not quite so well. [NOTE: This cream cannot be heated to sterilize it, but it can be regarded as self-sterilizing for the ordinary non-spore pathogens. Samples experimentally contaminated with *Staph. aureus*, *B. proteus*, and *Ps. pyocyanea* have always been found free from viable organisms after 24 hours. It is possible that spores of pathogenic clostridia, including tetanus, might survive in it (this point is being investigated), but the risk of such contamination may be regarded as extremely small. When the cream is to be kept for long periods chlorocresol (0.2%) could be added to it to prevent any growth of moulds.]

his cream should be applied with a knife-blade or spoon iously sterilized by dipping for 2 minutes in boiling water passing through a flame. The burn should not be washed before the cream is applied, nor the blisters be snipped. It should not be left on the burn for more than two days, because prolonged application involves a slight risk of inducing a sensitization dermatitis.

4. All first-aid procedures should be carried out with due precaution against the transfer of streptococcus to the burned surface. (Apart from "shock," this is by far the most serious risk for the burned patient.) Hands should be washed and dried before carrying out any treatment, and a mask or clean handkerchief should be worn over the mouth and nose.

If cream is applied the burn should afterwards be wrapped in a sterile cloth and bandage, or in a recently laundered towel. On no account should blankets be allowed to come into direct contact with the burns, because they are frequently contaminated with pathogenic organisms.—I am, etc.,

Birmingham.

LEONARD COLEBROOK.

## Obituary

JOHN FAWCETT, M.D., F.R.C.P., F.R.C.S.

Dr. John Fawcett, consulting physician to Guy's Hospital, who died in London on Feb. 18, aged 77, was the son of John Bisdee Fawcett of Lloyds and was educated at Dulwich College and at Guy's Hospital Medical School. He graduated M.B., B.S. Lond. in 1890 and took the M.D. in the following year, and soon afterwards the F.R.C.S. At Guy's Hospital he held a succession of posts, and for a time he was assistant physician to the Royal Free Hospital and Beane research scholar in materia medica. His early teaching appointments at Guy's were those of demonstrator in morbid anatomy and curator of the Museum; later he became Dean of the Medical and Dental Schools, and after retirement a Governor of the Medical School. In 1902 he was elected F.R.C.P., and he served the College as examiner for four years, councillor in 1920, censor for the three following years, and representative on the Senate of the University of London; he also examined in medicine for the universities of London, Sheffield, and Wales. During the last war he held a temporary commission in the R.A.M.C.

Dr. Fawcett joined the B.M.A. in 1893 and was vice-president of the Section of Medicine at the Annual Meeting at Nottingham in 1926. Two good causes in which he took a keen personal interest were Epsom College, on whose council he served, and the Invalid Children's Aid Association, of which he was vice-chairman. For four years he was the representative of the Board of Education on the General Nursing Council. He was also a member of the departmental committee on morphia and heroin addiction, and of the Ministry of Pensions disability committee.

We are indebted to Sir WILLIAM HALE-WHITE for the following appreciation:

John Fawcett had many sterling qualities: perhaps the most conspicuous was his efficiency. Whatever he undertook he did well. This was shown in his student days both at football and in his examinations, for not only did he take his Fellowship of the College of Surgeons but also his M.R.C.P., later becoming F.R.C.P. He had a very strong sense that, at whatever inconvenience to himself, he must carry out to the best of his ability that which he had undertaken. This outstanding sense of duty led to his nickname among the students of "honest John," an affectionate title well deserved. They looked up to him as an example of what a physician should be.

It is easy to understand that such a man was of the greatest value to a teaching hospital; he was always punctual in his visits, and his house-physician could depend upon his advice at any hour. He rightly considered that he was not only to look after the patients but also the students, and he took great pains to teach them. He had considerable ability as a teacher, and many generations of students owe much to him. It was a pleasure to him also to help them in their recreations by presiding over many of their clubs, such as the football. He was likewise always willing to serve conscientiously on the many committees connected with the hospital and school. For a time he was dean. Guy's Hospital and Medical School could not possibly have had a more devoted servant than John Fawcett, who always considered both of them to come before everything else. They, too, owe him much. Everyone felt that he took so much trouble, not in the slightest degree to benefit himself: it was said of him that he was one of the few who never had an enemy.

After he retired from active work at Guy's his old school Dulwich, the Invalid Children's Association, and Epsom College were fortunate enough to secure his help. He laboured for them all with his characteristic unselfishness and devotedness, and they all benefited. To Epsom he was treasurer: this meant much hard work not only at the London office but at Epsom. He took regular holidays, mostly in Scotland; whenever he could he got a day's shooting or golf or a good walk, but during the later years of his life he suffered miserable health. Many would have given in: not so John Fawcett: he strove hard at his voluntary tasks whenever it was physically possible. Like Johnson, he said, "I will be conquered, I will not capitulate."

## W. R. CAMMOCK, M.B.Glas., F.R.C.S.Ed.

Mr. W. R. Cammock, who was widely known as an aural surgeon in the Oldham and Rochdale districts of Lancashire, collapsed while driving his car on Feb. 4 and died shortly afterwards in hospital. His death in the prime of life has come as a great shock to his friends and has robbed South-East Lancashire of a very able surgeon.

Born in 1886, he was the only son of a Glasgow solicitor, and in that city he was educated, first at Hutchison's College and later at the University, graduating M.B., Ch.B. in 1906. After holding house appointments in Glasgow, where he was house-surgeon to Sir William Maclewen, he went to Stockton-on-Tees Hospital as resident surgical officer, and in 1911 took the F.R.C.S.Ed. Then followed a brief period in general practice, but, deciding to make aural surgery his career, he became resident aural surgeon at the General Infirmary at Leeds. He continued his studies for some months in Vienna, and in 1914 settled in Oldham, where he was soon appointed to the staff of the Royal Infirmary. There he rapidly developed a large and efficient ear, nose, and throat department and gained a wide reputation as an able clinician and operator. He was also on the staff of Boundary Park Hospital, Oldham, and, in more recent years, was appointed aural surgeon to Rochdale Infirmary and Birch Hill Hospital. In developing his specialty in this district of Lancashire Cammock worked single-handed and was something of a pioneer. He worked with great zest and read widely, keeping himself abreast of all modern developments. There was nothing stereotyped and rigid about him, and he was always willing to abandon old methods to achieve improvements. In recent years he had adopted the intrameatal approach to the mastoid with excellent results. He held, too, that it was the surgeon's job to adapt himself to human needs. It was this view which led him to take up thyroid surgery and to regard it as coming within the province of the laryngologist. When he settled in Oldham the incidence of goitres was very high indeed, and he addressed himself to the problem with characteristic zeal, becoming a real expert in the surgery of the thyroid. In all his work he set a most high professional standard.

Mr. Henry Poston, a colleague for many years, writes: He died as he would have wished, working at full pressure and at the height of his power. It seems hard for us who have long known and appreciated the man and his work to realize that no more will we hear him discuss and discourse on current surgical literature. For Cammock's reading and knowledge were catholic, and he was invariably *au fait* with the major advances in surgery. Essentially a clinician, he possessed an infinite capacity for taking pains and for attending to the detail of his work. In his heavy clinics he would listen as carefully and sympathetically to the last patient as he did to the first. He was a careful and courageous operator, keeping his eye on the patient and ignoring the clock. For many years he struggled obstinately against the bridle of Theages—chronic ill-health. He might perhaps have taken things more easily, but the line of least resistance was not his choice, and he gave the unforgiving minute its full sixty seconds' worth of distance run. To the Oldham Royal Infirmary he devoted the greater part of his long and strenuous professional life, and actually, at one period, supervised the x-ray and physiotherapeutic departments of that institution in his own serious and scrupulous way. Cammock had the inestimable gifts of being able to teach and inspire his house-surgeons, and not a few of those whose Gamaliel he was now occupy positions of influence and eminence in the realm of aural surgery. He was gentle but firm, knew what he wanted and saw that he got it. He never did any ill, and the good he did cannot be interred with his ashes.

## FRANK HINDS, M.D.

Dr. Frank Hinds, consulting surgeon to the Worthing Hospital, died in retirement on Feb. 5, aged 82. He had been president of the Brighton and Sussex Medico-Chirurgical Society in 1910, president of the Sussex Branch of the B.M.A. in 1922, and chairman of the Chichester and Worthing Division in 1927-8.

Mr. Herbert H. Brown writes: Frank Hinds entered University College Hospital as a student in 1880. At that time strict Listerian methods were practised by two of the younger surgeons, Marcus Beck and Rickman Godlee, and accepted by most of the younger men, including the resident staff. Victor Horsley was Frank Hinds's most intimate friend from childhood, a friendship which continued without interruption until Horsley's death in Mesopotamia in 1916. Hinds held the posts of H.P. and H.S. at the hospital and deputized for the R.M.O. He was a good diagnostician and surgeon, but his most outstanding quality was his unfailing courtesy and consideration for others: he was by far the most universally popular man of his time. He left in 1887 after taking his M.D.Lond., and became R.M.O. at the Hospital for Sick Children in Great Ormond Street, and then spent two or three years travelling about the world. On

his final return to England he accepted a pressing invitation from a U.C.H. friend, Dr. W. A. Gosling, to join him and his partner at Worthing. He was at once asked to serve on the staff of the hospital, at that time a small institution of only 27 beds. His great diagnostic ability and surgical skill and resourcefulness in any emergency brought him patients from all parts of Sussex, and during the course of his career at Worthing he performed with complete success several strikingly original and formidable operations. Perhaps the most remarkable was the complete and successful eradication of a large myeloid sarcoma of the femur at the Worthing Hospital in 1895. The case was recorded in the *B.M.J.* in April, 1908; it aroused great interest among American surgeons, and inquiries were made about the patient. Following an attack of encephalitis lethargica in 1920 Dr. Hinds's health, which had hitherto been good, began to fail seriously. From this disease and its sequelae he never completely recovered, and in 1922 he resigned from the hospital and from active surgical work, though continuing to see some of his patients until 1928, when he finally retired. He never lost the affection of any of his patients, nor of his medical colleagues and other friends.

A former colleague writes: No name in Worthing stood higher in public esteem than that of Frank Hinds in the prime of his career. He held a record at the Worthing Hospital remarkable alike for quality and length of service. It was a well-deserved tribute to his work that when in 1927 No. 1 Ward, the male surgical ward, was opened as part of a major reconstruction it was named after him. In his life-work we have seen general practitioner surgery brought to its highest development and highest scope of usefulness. Courtesy and kindness marked his dealings with professional colleagues; to him they turned as a friend and wise counsellor. He was ever ready to give encouragement to his juniors and to help with his opinion on a difficult case.

## THE LATE DR. G. C. ANDERSON

Sir Stanley Woodward, Master of the Society of Apothecaries of London, has sent the following letter to Viscount Dawson of Penn as President of the British Medical Association: "I had the unhappy duty of informing the Court at their recent meeting of the death of Dr. George C. Anderson, and I was asked to convey to you as President of the British Medical Association an expression of the Court's most sincere sympathy in the irreparable loss which the Association has suffered by the passing of its able Secretary. Not only the Association but the nation has suffered a great loss, and his innumerable friends, both in and out of the profession, a personal bereavement. His foresight enabled him in peacetime to prepare for the situation which would inevitably arise in the event of war, and his untiring efforts to ensure that the transition from war to peace should be accomplished as smoothly as possible will long be remembered. I shall be grateful if you will convey to your Council this Society's deep regret."

Dr. T. C. Routley, General Secretary of the Canadian Medical Association, has sent the following letter to Dr. Charles Hill: "We were deeply grieved to learn from your wire that Dr. Anderson had passed on, and we immediately sent you the following message: 'Very sorry to learn of Dr. Anderson's death. On behalf of Canadian Medical Association may I express sincere sympathy to the bereaved family and the British Medical Association.' Dr. Anderson was a grand fellow and one whom a great many of his colleagues on this side of the water were proud to claim as a friend. No doubt pressure of work and anxiety in recent months hastened his end, adding one more to the appalling toll of this terrible conflict. He will long be remembered with admiration and respect. On behalf of the Canadian Medical Association may I convey to officers and members of the British Medical Association sincere sympathy."

## The Services

Sir Morton Smart has been appointed civil consultant in physical medicine to the R.A.F.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Surg. Lieut. R. M. Macintosh, R.A.N.R., for courage, endurance, and devotion to duty; and Temp. Surg. Lieut. C. F. Cooper, R.N.V.R., has been mentioned in dispatches for services to the wounded after an enemy air attack.

The *London Gazette* has announced the award of the M.C. to Capt. H. M. Jones, R.A.M.C., in recognition of gallant and distinguished services in Italy.

## Universities and Colleges

### UNIVERSITY OF OXFORD

An election of two members of the Board of the Faculty of Medicine will be held on May 31. The members elected will come into office on the first day of Michaelmas Term, 1944, and will hold office, the senior for two years and the junior for one year from that day. The General Medical Electorate consists of all Oxford graduates in medicine who are members of Convocation. The Board of the Faculty of Medicine includes two members elected by the General Medical Electorate who must be members of that body and of whom one at least must be a person engaged in teaching one or more of the clinical subjects of the Faculty. Nominations of duly qualified candidates for election will be received by the Secretary of Faculties at the University Registry up to 10 a.m. on Wednesday, May 10. Each nomination must be signed by six members of the General Medical Electorate, and no candidate will be eligible whose nomination has not been received by that date.

### UNIVERSITY OF CAMBRIDGE

The following have been examined and approved for the degree of M.Chir.: B. N. Brooke, A. G. McPherson.

### UNIVERSITY OF LONDON

At a meeting of the Senate held on Feb. 23 the title of Professor Emeritus of Bacteriology in the University was conferred on Sir John C. G. Ledingham, F.R.C.P., F.R.S., on his retirement from the professorship of bacteriology at the Lister Institute of Preventive Medicine.

The degree of D.Sc. has been conferred on A. G. McDonnell Weddell, M.D., an internal student at St. Bartholomew's Hospital Medical College.

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

Prof. A. J. E. Cave will give a series of Arnott demonstrations and museum lecture-demonstrations, open to advanced students and medical practitioners, at the College (Lincoln's Inn Fields, W.C.) on Mondays, Wednesdays, and Fridays, from March 6 to 24, at 4 p.m.

## Medical Notes in Parliament

### Report on Infant Mortality in Scotland

Major MARKHAM drew attention on Feb. 16 to infant mortality in Scotland. He recalled that up to 1941 this mortality rose rapidly, and that on July 8, 1942, the Secretary of State for Scotland had said the figure per 1,000 births rose from 68 in 1939 to 83 in 1941. The Minister then announced that he had asked the Scientific Advisory Committee of the Department of Health for Scotland, under the chairmanship of Sir John Boyd Orr, to consider and report quickly on the causes of this rise and to suggest remedial measures. Major Markham asked who had changed those terms of reference. Changes in diet, housing, employment, and medical services had a profound effect on infant mortality during the war years, and if the committee had carried out its original terms of reference its findings would have assisted not only Scotland but the Empire generally. He understood that Sir John Orr denied that he had anything to do with the subcommittee which drew up the report. Major Markham contended that much information relating to the war years was available. He complained that the report made no detailed comparison with Iceland, which was comparable to Northern Scotland, nor to great American cities that might be compared with Glasgow, nor to Australia. He objected to the declaration in the Minister's introduction to the report that remedies for infant mortality must be found in the immediate post-war years. The obvious question was, Why not now?

The statistical basis of the report, he continued, was poor. It did not mention that changes were due to war conditions, such as reduction in employment and poverty and change in diet. There was no reference to the fact that calcium and vitamin B<sub>12</sub> had been added to national bread. There was no reference to problems caused by evacuation nor to the effect of fuel shortage on infant mortality. There was no mention of vitamin E, the reproduction vitamin. There was no information on the difference between infant death rates in ordinary homes and in institutions. Most of the overseas comparisons were from 6 to 10 years old. There was no mention of the new Simpson Memorial Hospital in Edinburgh, which had air-conditioned

wards; whether these were successful or not. The report should have paid attention to environmental condition including smoke and fog and temperature.

Mr. JOHNSTON, in replying, said that although Major Markham had raised the subject on the adjournment the Government's promise to afford facilities for an adequate discussion on it still held good. The Boyd Orr Committee did not analyse the wartime trend because there was little published information for the war years. They said that the most important environmental conditions of diet, housing, employment, and medical services were highly abnormal in most areas. That was true. They said it was impossible to judge to what extent changes since 1939 were likely to be permanent. Mr. Johnston thought it would have been desirable to analyse wartime trend because Scotland last year had the lowest infant mortality in its history—65 per 1,000. Five members of the committee had knowledge of the conditions abroad. Dr. Douglas, chief maternity and welfare officer of the Department of Health, had knowledge of New Zealand; other members had been to Scandinavia and knew conditions there. As for fuel, the Scottish consumer saved about 13% less coal than the English householder, but Titmuss had shown that fuel conditions were not the cause of the infant mortality in Holland, and had drawn attention to the fact that in Iceland the rate was 28.3 per 1,000 live births. Titmuss therefore judged that the heating of the household was not a primary factor. It was true that the New Zealand figure was 29, but that excluded the Maori, which was 97. In July 1939, the unemployment figure in Scotland was 11.5; in January 1944, it was down to 1. Mr. Johnston believed that a factor causing a reduction in the infant mortality was that more purchasing power was coming into the home. Maternity homes had gone up by 50% during the war, although 108 maternity beds in rural areas were being put to wartime uses. Local authority associations promised to do all they could by increasing the intake of orange juice and vitamin tablets and by requisitioning more large houses.

### Shelling of Field Medical Units

On Feb. 22 Mr. SORESENSEN asked the Secretary of State for War if he would make a statement respecting the bombing and shelling of field hospitals respectively on Feb. 7 and 10 in the Anzio area; and whether, generally, the immunity of the Red Cross was being observed. Sir J. GRIGG: I could not give a categorical answer to this question without considerable investigation. There have been certain incidents, but, generally speaking, so far as field medical units are concerned the immunity of the Red Cross emblem has been respected. No official report has reached me that it has in fact been violated in the Anzio area.

### Penicillin

Mr. ATTLEE told Sir William Davison on Feb. 24 that he knew Prof. Fleming had made no financial profit from his discovery of penicillin. Others had played an important part in showing the full value of Prof. Fleming's original observation and in developing it as a discovery capable of practical application. The question of financial rewards for medical discoveries had been carefully examined on earlier occasions, with the conclusion that any such system, even if desirable, could not be administered equitably in practice. The policy of the Government was to support medical research work in progress and not to offer payments on the basis of results.

In reply to Commander Locker-Lampson on the same date Mr. CHARLES PEAT said penicillin was not a proprietary article. It was at present being manufactured only under Government auspices. Manufacture would be controlled so long as that was necessary in the national interest.

Mr. LAW announced on Feb. 23 that, owing to the interest taken in penicillin, several hundred copies of the current number of the *British Medical Bulletin* had been printed for distribution to members of the medical profession in the United Kingdom. This *Bulletin* was produced by the British Council to keep medical circles abroad informed of medical research work in the United Kingdom. Owing to paper shortage only a few copies of each number were available in this country.

*Cholera and Smallpox in India.*—Mr. BUTLER, replying for Mr. Amery on Feb. 17, stated that in India the cholera and malaria situations were improved, but incidence was still abnormally high. Smallpox also presented a problem. He had no complete figures for cases treated, but up to Jan. 29 over 2,000,000 cholera inoculations and 1,500,000 vaccinations had been performed. Mr. Amery was endeavouring to obtain exact figures of deaths in India from starvation and resulting diseases.

*Disability Claims for Pneumococcosis.*—Mr. HERBERT MORRISON told Mr. Henry White on Feb. 9 that since July 1, 1943, when the Pneumococcosis Compensation and Benefit Schemes came into operation, the Medical Board granted certificates of disablement or suspension in two cases under the compensation schemes in the North Midland Region and refused 25. One death was certified

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## Economy in Disinfectants

### USE OF HYPOCHLORITES RECOMMENDED

In a statement on economy in the use of certain types of disinfectants in short supply the Therapeutic Requirements Committee of the Medical Research Council emphasised the necessity of selecting "those materials which are most readily available." Among the substances recommended to replace those in short supply for special purposes are "hypochlorites."

*Milton*, the Hypochlorite Antiseptic, has been recommended in recent medical and pharmaceutical literature or in statements by authoritative bodies for many uses including the following:—

#### *As an antiseptic and therapeutic agent*

In the Envelope Irrigation treatment of wounds, burns and ulcers.

Treatment of simple boils, carbuncles, whitlows and any septic wounds.

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For the sterilisation of the new standard Jaconet, Battiste and Artificial Silk Waterproof Dressings.

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For the emergency sterilisation of water.

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## MILTON THE STANDARD HYPOCHLORITE

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## INCOME TAX

## Cost of Laying up Car

R. M. since joining the Army has incurred sundry expenses in connexion with the car he formerly used in civil work. Can he claim an allowance for such expenses?

\* No; they are not incurred in the performance of the duties for which he is now being remunerated.

## "Pay as you Earn"

W. S. asks as to the effect in his case of Clause 8 of the new Bill.

\* The effect is that if his increase of salary is not in the ordinary course of events, he can be charged tax on the amount of the increase and, as regards that tax, will have to pay it in full—i.e., without the benefit of the 7/12ths "discharge" (or forgiveness) which will apply for 1943-4 to the normal ease and to the original assessment.

J. M. is employed in the E.M.S. at a salary of £650 a year and asks how he stands as regards "pay as you earn."

\* Presumably tax is being deducted from his salary under the provisions applicable to persons in the employment of the Government, and not under the general deduction scheme applicable to persons in private employment. If that is so he is not affected by the "pay-as-you-earn" scheme.

## Service in India

W. C. is serving in the Indian Army Medical Corps and is entitled to a reduced share in the profits of a British practice. What is his position generally?

\* In the first place he is not liable in respect of his Indian Service pay. In the second he cannot claim the full amount of the personal allowances, but only the proportion which his British—i.e., liable—income bears to his total income (whether liable or not). Thus if his only other income is, say, £1,000 from Indian pay, he will be entitled to 500/1,500 of the allowance for children, the personal allowance of £140, and so on. Further advice cannot be given without details; W. C. is recommended to get into touch with the Inspector of Taxes for the area in which the practice is situated.

## Flat Provided—Schedule A Tax

"LAMBDA" is employed as an assistant; his principal provides him with a furnished flat, rent and rates free. Who should pay income tax on the annual value of the flat?

\* The tax on the value (as unfurnished) is assessed under Schedule A on the statutory "occupier." In the case of a furnished flat the person to whom the furniture belongs is regarded as the "occupier" and is no doubt the person named in the assessment. He, and not "Lambda," is legally responsible for payment of the Schedule A tax.

## LETTERS, NOTES, ETC.

## The Record in Urinary Calculi

Mr. T. L. CHAPMAN, F.R.C.S., writes from Glasgow: Your correspondents on this subject may be interested in a note which I published (*Brit. J. Urol.*, 1942, No. 3, p. 131). This concerned a case where an enormous number of well-formed, almost spherical, calculi were removed from the bladder and diverticula of the bladder: 750 of them were arranged and photographed for me by a colleague and the photograph was published. In such cases it is difficult to say what constitutes a calculus, and there is not much to be gained by discussing the record number. We may find ourselves "numbering sands" like the "poor duke" in "Richard II."

## Professional Confidence

Dr. D. SAKLATVALA (West Bromwich) writes: The correspondence in the *Journal* of Feb. 12 on the Mosley affair has brought to my mind a problem which has long puzzled me. Ever since I embarked on medical practice ten years ago I have wondered why I must put clinical details on panel certificates, work certificates, school certificates, and similar documents. I have always felt that a simple statement that the patient is unfit for work, school, or what not, should, if given in writing by a medical man, suffice. At some time in the dim past the profession has failed to insist on this—it rightly could have insisted—and the present widespread demands for clinical details of our patients, as cited by Dr. Noordin, are no more than the natural result of our past laxity. Can we not even now, and at the risk of much opposition, put our house in order in this respect?

Dr. C. W. F. MCKEAN (London, W.6) writes: I was disappointed to see that only one correspondent replying to Sir Farquhar Buzzard's letter took up the vitally important point of patients' loss of professional secrecy and confidential treatment through the present-day universal demands for medical certificates giving the nature of the incapacity. Although full information should be given

to medical boards, the majority of certificates are for lay person who should have no concern with the complaint. They may know the patient socially or live in the same district. In any case a little knowledge is a dangerous thing. As a worker in venereal diseases I am particularly interested in this question of privacy, but apart from this, I would ask the profession to consider this point and to demand that patients should be given secrecy for all complaints as a matter of course. A step in the right direction was made with milk certification, but after that success the matter hung fire.

## Marginal Gingivitis in School-children

Dr. A. E. W. MILES, L.D.S. (London, W.1) writes: In the reply under this heading (Feb. 5, p. 207), attention is correctly drawn to the fact that mouth-breathing is the commonest cause of anterior marginal gingivitis in children. But no details are given of the methods to be adopted to correct this habit, which is harmful to the health of the gingivae and inimical to the growth of the jaws, and removes the intermittent positive intra-oral pressure of nasal respiration, to mention only the dental aspects of mouth-breathing. Nasal patency being present, nasal breathing is re-established in the daytime by lip exercises, which consist of holding a small flat object, such as a button, lightly between the lips for at least one hour a day, the more frequently the better; at night, by the wearing of an oral shield, which is easily made by a dental surgeon.

## Halitosis

Dr. A. D. McDWYER (Dublin) writes: In the answer to the query on halitosis (Jan. 29, p. 172) no reference was made to the excellent annotation in the *Journal* (1942, 1, 530) on the experimental work of Crohn and Drosd. Briefly, odorous substances are mainly absorbed in the small intestine and stored in the liver, from which they go into general circulation for 48 hours. In unexplained halitosis a low-fat diet (40 to 60 g.) gives relief. It is thought that certain offensive volatile products of fat digestion pass to the liver and from there are slowly given off in general circulation. May I also add that either dental sticks or floss provide the best method of removing food particles retained between the teeth where both a toothbrush and mouth washes fail. An early atrophic pharyngitis is a common unrecognized cause and can be reduced to a minimum and prevented by a well-ventilated bedroom during sleep.

Dr. W. STUART THOMSON (Edinburgh) writes: Referring to the answer to a question on halitosis in your issue of Jan. 29 (p. 172) I venture to suggest that the connexion between halitosis and the alimentary canal distal to the pharynx is not sufficiently stressed. Surely we are all aware of cases of a temporary halitosis accompanying (? due to) a temporary digestive disturbance. Why should not chronic indigestion, constipation, colitis, etc., be accompanied by fetor oris in a similar manner? Might I also suggest that once a sensitive type of person is aware of having a fetor oris it tends to be accentuated or perpetuated by the mental factor.

## An Old Midwives' Tale

Dr. W. RADCLIFFE (Wivenhoe) writes: Referring to the note entitled "An Old Midwives' Tale" in the *Journal* of Feb. 19 (p. 271), the idea that an 8-months foetus is less viable than one of 7 months goes back at least 200 years. In Spencer's *History of British Midwifery* John Maubray is quoted as stating in 1724 that a 7-months foetus is favoured in astrology because of the magic number 7; but the eighth month is peculiar to the planet Saturn, and a child born under this planet is always weak and, if it survives, has a tender constitution, if it is not indeed half-witted also. Perhaps the modern astrologers have something to say about this.

## Retarded Speech

Dr. DOROTHY RICHARDSON (Cornwall) writes: With reference to your answer to the question on retarded speech appearing in the *Journal* of Jan. 29 (p. 171), I should like to mention that my eldest boy, with normal hearing and perfectly intelligent, didn't speak a word until the age of 3½, when within a week he tackled dozens of words, many quite long ones such as "periwinkle," "elephant," etc. I am told my husband's cousin, who is a successful chartered accountant, never said a word until he was 4, so possibly there is some familial trait. I have also heard of similar cases in other families. I am writing this so that the questioner may, if he is satisfied that the child is not deaf or mentally deficient, reassure the parents that there is still hope until the age of 4. In the cases mentioned above no treatment was given and the children were brought up as ordinary children are.

## Tuberculosis Associations

We are asked to state that the National Association for the Prevention of Tuberculosis, the Tuberculosis Association, and the Spero Fund for the Industrial Welfare of Tuberculous Persons have no connexion whatever with an organization called the "T.B. Association," whose registered office is at 195, Fore Street, Angel Place, Upper Edmonton, N.18.



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## TOXIC EFFECTS IN WOMEN EXPOSED TO INDUSTRIAL RUBBER SOLUTIONS

BY

J. L. HAMILTON-PATERSON, M.D.  
*Pathologist at Redhill County Hospital, Edgware*

AND

ETHEL BROWNING, M.D.  
*H.M. Medical Inspector of Factories*

This paper is the result of two years' investigation of the effects of industrial rubber solutions on the workers using them. Nowadays these are almost exclusively women. The solutions contain varying amounts of benzene and of the aromatic hydrocarbons benzene, xylene, and toluene; xylene and toluene are less toxic than benzene, but the latter is still used because of the difficulty of obtaining the former in sufficient amounts. Factory conditions have been much improved in recent years, and fatal cases of benzene poisoning are fortunately extremely rare; but even mild benzene intoxication may lead to irreversible changes in the haemopoietic bone marrow; also some people seem particularly susceptible, and develop signs of poisoning with only a limited exposure, particularly pregnant women (Meda, 1922; Hamilton, 1925; Smith, 1928; Hamilton-Paterson, 1941). It was hoped that as the result of this investigation it would be possible to identify early cases of benzene absorption and remove them from contact before any permanent changes ensued. That this is possible will be clearly shown, and also that, with suitable periods of "rest," no harm will accrue to those who continue to work under these conditions.

Rubber solutions are used for a variety of purposes in industry, but this investigation was confined to their employment in a special manufacturing process in the aircraft industry. The examinations were carried out in 13 factories scattered over the country. The investigation has been conducted in two parts. In the first, sample groups in each factory, totalling 200 women, were clinically examined and had blood counts made. These counts have been compared with the counts of 200 control women. In the second part of the investigation all the women working in one factory have been similarly compared with a group of women in the same factory who had never been in contact with rubber solution. The effects of "rest" were also studied in this group of women. The manufacturing process in question involves the use of rubber solution and adhesive "cements" which contain aromatic hydrocarbons varying in strength from 5 to 20% in practically all some proportion of this is benzene. Even though adequate ventilation is provided, as required under the India-rubber Regulations, 1922 (S.R. & O. No. 329), it is almost impossible for a woman working in certain positions with a brush and an open pot of solution, not to inhale the fumes. In this way she is probably exposed to a concentration of benzene nearly as high as that in the solution itself. The practice in some workshops, under intensive production, of allowing large numbers of treated articles to remain in the workroom until perfectly dry may result in a further increase of the general atmospheric content of benzene. It should be remembered in this connexion that the general atmospheric concentration of benzene is by no means an entirely reliable criterion of benzene exposure, since individual workers may at any time be exposed to localized "pockets" of high concentration, particularly when working over open containers.

### Clinical Results

A routine clinical examination, including condition of teeth, throat, lungs, heart, skin, and in many cases blood-pressure readings, was

carried out, and a careful case history taken. The chief points to which attention was paid in the case history were:

1. *Previous Occupation.*—A history of previous exposure to any toxic substance would naturally have to be taken into account in evaluating any disturbance of health or deviation from the normal blood picture. Since many of these women were in the 35-45 age group the previous occupation of a large proportion (about 40%) had been domestic. Among the other occupations represented were clerks, telephonists, waitresses, shop assistants, hairdressers, dressmakers, mill-bands, weavers, and machinists. Only in two cases was there a history of occupation which possibly involved exposure to toxic solvents—one a rubber worker, the other a cleaner of aeroplanes. In both, the blood picture was within normal limits and there were no complaints of ill-health.

2. *Previous Illness.*—No history of previous illness likely to produce haematological disturbance was obtained except "long-standing anaemia" in one case, with a blood picture of mild microcytic hypochromic anaemia only. In 84% of all cases, in fact, no history of illness other than "childish diseases" was elicited; the remaining 16% gave a history of bronchitis (7 cases), tonsillitis (4), appendicitis (3), pneumonia (2), jaundice (1), rheumatic fever (3), heart trouble (2), gastric ulcer (1), gastritis (1), asthma (1).

3. *Symptoms.*—In all, 72 of the 176 women examined (approximately 41%) complained of symptoms probably referable to their occupation. These were in most cases not severe, and were in the following order of frequency:

(a) Lassitude (35).—Many of the women emphasized the fact that their fatigue, especially at night, had been particularly noticeable "since being on this job." It is possible, of course, that this symptom—particularly in women previously engaged in domestic work only, and now doing 47 to 55 hours a week in the factory, with some domestic duties in addition—may be attributed to excessive exertion rather than to benzene absorption; but many of the women appeared to relate their fatigue definitely to their occupation.

(b) Headache (27).

(c) Dizziness (25).—In one factory this symptom took an acute form, 18 women being overcome in one day by what they described as "fainting attacks" and "feeling drunk." Investigation showed that these attacks were very similar to the "benzene intoxication" reported by Kobert (1906) and others, and that the solutions used did in fact contain a high proportion of benzene. A combination of heavy fog, poor ventilation, and intensive production on the day on which this incident occurred was probably responsible for a sudden increase of the benzene content of the air of the workshop.

(d) Nausea (15).—The nausea and vomiting are probably not due to benzene but to other fumes evolved during the process. They seemed to be most pronounced in the mornings, particularly Monday mornings, when the shops had been closed over the week-end, and the fumes from the drying treated articles had accumulated.

(e) Vomiting (4). (f) Dyspnoea (6). (g) Loss of weight (3). (h) Gastric pain (2). (i) Bleeding from the gums not accounted for by local oral conditions (2).

An unusual complaint, for which no satisfactory explanation can at present be given, was that volunteered by several women that the faeces smelt strongly of the rubber solutions used.

4. *Menstrual Disturbance.*—Of these women 45 were between the ages of 40 and 55, and 7 of them complained of menorrhagia; this may probably be attributed to menopausal or pre-menopausal disturbance rather than to a benzene effect. Of the 131 younger women (aged 19 to 39) 4 complained of increased frequency of periods (which may have been associated with the change from domestic to factory life), and only one of recently increased loss. Five women were pregnant, but their health did not seem to be affected.

## Haematological Results

The blood counts of the 200 women working with rubber solution have been analysed and compared with the counts of a group of 200 women, of similar age and conditions of life, who, so far as was known, had never been in contact with rubber solution. The results are shown in the accompanying Chart, in which frequency

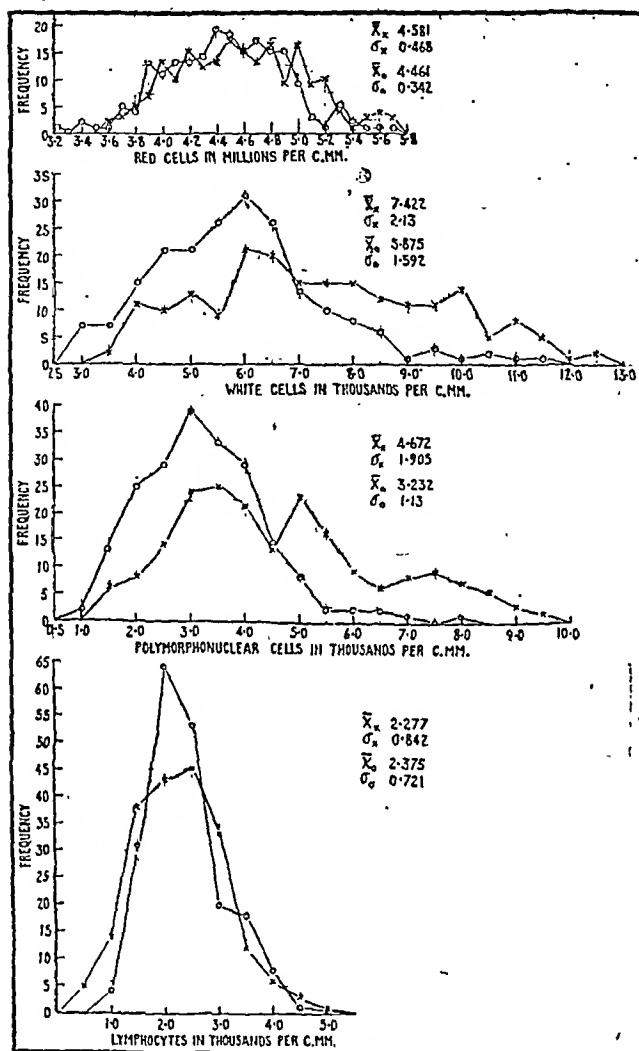


Chart showing frequency distribution curves of red cells, white cells, polymorphs, and lymphocytes in the control group (x—x) and the group exposed to fumes of rubber solution (o—o).

distribution curves of the red cells, white cells, polymorphs, and lymphocytes are shown. It was impossible to treat the haemoglobin results in a similar manner, because the method of determining these varied with the conditions obtaining in the different localities where the investigation was pursued, and the methods employed did not all have the same degree of accuracy. This, with the possible variations in the standards used, introduces a degree of error which would render statistical analysis valueless. The differential counts were calculated on a basis of 200 cells where there was no deviation from the normal; 400 were counted in any doubtful case.

In the Chart the mean and its standard deviation for each set of observations are recorded, and from these the probable significance of the difference between means of the red cells, white cells, polymorphs, and lymphocytes of controls and rubber-solution workers can be calculated. If the difference between the means is greater than twice its standard error, then the difference is significant, and the chances are 19 to 1 against such frequency distribution curves being obtained from the same population of cells by random

sampling—i.e., if  $\bar{X}_x - \bar{X}_o > 2 \sqrt{\frac{\sigma_x^2}{N_x} + \frac{\sigma_o^2}{N_o}}$  the difference is significant, where  $\bar{X}_x$  and  $\bar{X}_o$  are the means,  $\sigma_x$  and  $\sigma_o$  their standard deviations, and  $N_x$  and  $N_o$  the numbers of observations in the samples. The daily variations in the various elements of the blood count introduce a possible source of error into comparisons of this

kind, but so far as is possible this has been corrected by taking the counts at the same time of day. However, to allow for this and other errors arising from dilution and counting, we decided not to call a difference between means significant unless it was more than 5 times the standard error of the difference.

The results of these comparisons are shown in Table I, from which it will be seen that significant decreases in the mean values of the total white counts and the polymorphonuclear cells (a decrease in

TABLE I.—Comparison of Blood Counts of 200 Female Controls with those of 200 Females Working with Rubber Solution

	Controls		Rubber-solution Workers		$\bar{X}_x - \bar{X}_o$	
	$\bar{X}_x$	$\sigma_x$	$\bar{X}_o$	$\sigma_o$	$\sqrt{\frac{\sigma_x^2}{N_x} + \frac{\sigma_o^2}{N_o}}$	
R.B.C.	4.581	0.468	4.461	0.342	2.9	Not significant
W.B.C.	7.422	2.130	5.875	1.592	8+	Significant
Polys.	4.672	1.905	3.232	1.130	9+	Not significant
Lymphs.	2.277	0.842	2.375	0.721	1+	

polymorphonuclear leucocytes will hereafter be referred to as "neutropenia") are present in the women working with rubber solution. It will be seen that the standard deviation of the means is always larger in the control group, and this may be because the counts in this group were performed by several persons, whereas in the group being tested all the counts were done by one of us (E. B.). However, the final effect of this is to increase the value of the standard error of the difference between the means and thus decrease the ratio of the difference to the standard error; this will reduce the possibility of getting significant differences and not increase it. The monocytes, eosinophils, and basophils have not been included in this statistical comparison because their numbers are relatively small. Eosinophilia is, however, a recognized feature of the syndrome of severe chronic benzene poisoning.

In considering the individual cases of the test group the following scheme was followed in judging whether the woman should be considered as a possible case of benzene intoxication (Hamilton-Paterson, 1941). A plus sign was given for any of the following abnormalities: Hb below 80% Haldane or its equivalent, with either a macrocytic or microcytic anaemia; white cells below 5,500 per c.m.m.; polymorphs below 3,000 per c.m.m.; eosinophils more than 160 per c.m.m., with a white cell count less than 5,500 per c.m.m.—suggestive symptoms. The presence of three plus signs is suggestive of benzene poisoning, and that of four or more plus values diagnostic in the absence of any obvious causation other than exposure to benzene.

Benzene absorption may of course be present with only one or two plus values, but true benzene poisoning in such a case is rare and is usually accompanied by well-marked clinical signs. The analysis showed that 34 women (17%) were possible cases of benzene poisoning, and that 19 women (9.5%) had four or more plus values and were probable cases; a total of 53 out of 200 (26.5%). The frequency with which the abnormalities occurred in these cases was: neutropenia 50 times, leucopenia 44 times, anaemia 41 times, suggestive symptoms 27 times, and eosinophilia 15 times.

In the second part of the investigation all the women in or factory working with rubber solutions were tested and compared with women in the same factory who had never been in contact with such solutions. In all, 92 subjects were tested—62 contacts and 30 controls. Blood counts on the contacts were done after six months' work with rubber solutions, and those who showed changes suggestive of severe benzene absorption were removed to another part of the factory, where they had no contact with the solutions. After such a "rest" period of three months they again had blood counts to see what improvement, if any, had occurred.

The results are shown in Table II. The numbers involved were too small to compare statistically; averages have therefore been taken and the maxima and minima in each group recorded. It will be seen that the results for the 30 control women agree quite well with the 200 controls in the first part of the investigation. Also, the averages for the 62 contacts are similar to those for the 200 contacts already recorded, except for the red cell count, which is higher than in the control group. The variations in the control and contact groups, as estimated by the maxima and minima, are of the same order. The results in this factory therefore agree well with those of the random samples from the larger number of factories, and, conversely, they suggest that the samples from the other factories closely represent the state of each factory as a whole.

Of the contacts 18 were removed and "rested" because of abnormalities of the blood counts. The averages of this group are shown in Table II, and also their averages at the end of the three months rest period. The difference is striking: the white cell count has increased from 3,680 per c.m.m. to 6,140 per c.m.m., and the polymorphs from 1,750 per c.m.m. to 3,410 per c.m.m. The counts

from showing a gross leucopenia and neutropenia, have returned to within normal limits. These results, indicating recovery from the depressive effect of benzene on the leucopoietic system, are closely comparable with those observed (e.g., Goodfellow, 1935) in radium and x-ray workers. To enhance the value of this observation three

TABLE II

30 female workers not in contact with rubber solution												
	Irb	R.B.C.	W.B.C.	P	L	M	E	B				
				e.mm.	%	e.mm.	%	e.mm.	%	e.mm.	%	%
Aver. ...	88.3	4.50	7,500	4,440	59.5	2,600	34.3	343	4.5	103	1.5	18
Max. ...	106	5.50	12,400	8,920		4,450		1,060		330		116
Min. ...	78	3.73	3,100	1,540		990		31		0		0
62 females after 6 months' work with rubber solution												
Aver. ...	90.7	4.71	5,400	3,100	56.25	1,900	36	290	5.45	102	2.1	4
Max. ...	112	5.64	10,700	6,950		4,620		1,000		448		62
Min. ...	78	3.75	3,100	1,120		750		48		0		0
18 females with blood change suggestive of marrow hypoplasia, after 6 months' work with rubber solution												
Aver. ...	86	4.54	3,650	1,750	47.7	1,630	44.2	202	5.5	73.5	2.1	15.5
Max. ...	104	5.92	4,800	2,740		2,310		360		192		40
Min. ...	64	3.73	3,000	1,120		1,180		48		0		0
The same 18 females after 3 months' rest away from rubber solution												
Aver. ...	86.3	4.61	6,140	3,410	55.5	2,360	35.4	276	4.5	92	1.5	6
Max. ...	100	5.49	8,100	5,750		3,900		576		300		132
Min. ...	74	3.66	4,000	1,580		1,340		100		0		0
3 females showing improvement of count with rest, and deterioration on further contact with rubber solution												
Case 1												
12 contact	88	4.16	4,200	1,680	40	2,310	55	168	4	42	1	0
1/12 rest	85	4.49	7,400	4,440	60	2,520	34	296	4	74	1	0
12 contact	88	4.4	4,100	1,480	36	2,540	62	492	12	0	0	0
Case 2												
12 contact	104	5.0	4,000	1,680	42	1,840	46	320	8	120	3	40
1/12 rest	90	4.47	3,800		38		48		11		3	0
12 rest	88	4.2	8,100	5,180	64	2,590	32	243	3	81	1	0
12 contact	86	4.3	5,500		40		52		4		4	0
12 contact	88	4.4	4,500	1,800	40	2,610	58	90	2	0	0	0
Case 3												
12 contact	90	4.81	4,400	2,640	60	1,450	33	308	7	0	0	0
1/12 rest	86	4.80	6,700	3,220	48	3,020	45	400	6	67	1	0
2/12 contact	82	3.92	4,100	2,050	50	1,600	39	370	9	82	2	0

of these women were put back on to the benzene process and again examined in two to four months' time. Their counts are shown in the lower part of Table II, and require but little comment. In each case further contact with rubber solution has led to deterioration of the count.

#### Urinary Sulphates

It has been suggested (Yant *et al.*, 1936) that the determination of the ratio of inorganic to organic sulphate in the urine would be useful in discovering early cases of benzene poisoning. Of the absorbed benzene 90% is excreted in the lungs (Feil, 1933). The remaining 10% is oxidized in the body, conjugated with sulphates in the liver, and excreted in the urine, thus lowering the inorganic/organic urinary sulphate ratio. The lowest normal ratio is about 80/20 (Schrenk *et al.*, 1936; Kammer *et al.*, 1938). Yant *et al.* (1936) state that a decrease in inorganic sulphate in the urine is a constant and early sign of benzene poisoning in animals. A distinct decrease occurred even with conditions of exposure which did not produce anaemia or leucopenia. They suggest that the striking nature and reliability of the change in animals exposed to benzene should serve as a measure of the exposure and potentially harmful conditions in workers, before injury to the organism has occurred. It is emphasized that the changes are merely indicative of exposure and not of poisoning or damage.

Seventeen women with neutropenia, in the factory which was completely surveyed, submitted specimens of urine. The sulphates

were estimated by the method of Peters and van Slyke (1932). All the results were within normal limits: the lowest ratio recorded was 81/19; all the rest were 85/15 or over. Twenty controls similarly examined gave readings ranging between 82/18 and 97/3.

These results would suggest that Yant's findings in animals cannot be applied to man, since in the series recorded here neutropenia certainly preceded urinary changes. In well-marked cases of chronic benzene poisoning the test is useful for confirming the diagnosis, as the inorganic sulphate may fall to below 50% of the total.

#### Discussion

As has been shown in the analysis of the results, the most striking changes in the blood counts are the leucopenia and the neutropenia. These are, of course, well known as the most common changes in the syndrome we call chronic benzene poisoning, before the development of the classical picture of aplastic anaemia, but it can be shown that they may occur in workers who show no clinical abnormality. Out of the 200 women exposed to rubber solutions and examined, 167 (83.5%) had white counts below the mean of 7,422 per c.mm. for the control group; 50.5% of the controls were below this mean. These figures are calculated from the frequency distribution curves (see Chart), and indicate that 33% of the test series have abnormally low white cell counts: 184 (92%) had lower polymorphs than the normal mean of 4,672 per c.mm., 55.5% of the controls being below the mean. Here 36.5% of the test series show an abnormally low polymorph count. In the analysis previously made 53 women (26.5%) of the test series were shown to be either suspicious or definite cases of severe benzene absorption; 44 of the series (22%) were suffering from leucopenia, and 50 (25%) had abnormally low polymorph counts. Thus it is clear that the white cell count has been lowered in 11% and the polymorph count in 11.5% of the test series where there was no indication of benzene poisoning.

It seems obvious, therefore, that there is a definite change in the white cell and polymorph counts before the appearance of other criteria which make a diagnosis of benzene absorption possible. The leucopenia and the low polymorph count run hand-in-hand—33% abnormality in the former and 36.5% in the latter; that is, the leucopenia is directly due to a reduction in the number of polymorphs. This is confirmed by the observation that there is no significant difference in the mean number of lymphocytes in either the test or the control group. The primary change is therefore the reduction in the number of polymorphs. This reduction is reflected in the bone marrow in a case reported by Piney and Hamilton-Patersoo (1943) in which the myelogram showed a reduced percentage of myelocytes and metamyelocytes. To sum up, we may say that the essential change recorded in the test group of women is a neutropenia and that this makes its appearance before there is enough evidence to justify a diagnosis of benzene poisoning.

We have already shown that there is no significant difference between the means of the red cell counts of the exposed and control groups. On the other hand, 41 (20.5%) of the women picked out as possible cases of benzene poisoning showed anaemia—i.e., haemoglobin less than 80% and a colour index outside the limits of 0.85 to 1.10. The probable explanation of this anomaly is the different methods of haemoglobin estimation used—e.g., Haldane, Sahli, an alkaline haematin method (Clegg and King, 1942), and, on some occasions when no other was available, Tallqvist papers. It is possible that many of the results obtained by the last method were unreliable and may have caused us to mark a case as anaemic when in fact no such anaemia existed. It was because of this possible source of error that no attempt was made to compare the haemoglobin results statistically. In severe benzene poisoning, anaemia—either macrocytic and hyperchromic or microcytic and hypochromic—may develop, but the results of this investigation do not suggest that anaemia in any form is a constant early feature of the malady. Iron-deficiency anaemias may be difficult to distinguish from benzene anaemia because they may show a low white count with an abnormally low polymorph count; but administration of iron will probably separate them, because the few cases of benzene anaemia which we have been able to treat in this way have shown no improvement in the haemoglobin percentage and no reticulocytosis.

Eosinophilia has been stressed by some authors, particularly Dimmel (1932-3), as a feature of benzene intoxication. In the present series 18% of the exposed workers and 16% of the controls had more than 160 eosinophils per c.mm., while of the 53 affected workers 14 (26%) showed a similar change. Whitby and Britton (1942) give the normal maximum for eosinophils as 400 per c.mm. This may be so with a relatively high white count; with a white count of less than 5,500 per c.mm. 160 eosinophils should be regarded as the maximum.

Since this investigation has shown neutropenia to be the characteristic change found in early absorption of benzene, an examination of the incidence of neutropenia in the cases showing suspicious symptoms has been made. It may be stated at once that no such consistent relationship exists. Twenty-six (36%) of the 72 women presenting symptoms and 39 (37%) of the 104 symptom-free women had polymorphonuclear counts below 3,000 per c.mm.; that is, neutropenia occurs as often in women without symptoms as in those with them. Again, while three of the lowest polymorph counts recorded (1,600, 1,790, and 1,850 per c.mm.) occurred in three women complaining of more than one symptom—e.g., headache, dizziness, and nausea—even lower values (1,380 and 1,440 per c.mm.) were found in women with no apparent disturbance of health.

Menorrhagia has often been stated to be a leading symptom in chronic benzene poisoning. Eight cases occurred in this investigation, and seven of these were in women between the ages of 40 and 55. Is this menorrhagia due to benzene or to the menopause? As most of the cases occur between the ages of 40 and 55 it would appear at first sight as if the symptom was menopausal; it may be, however, that women at the menopause are more susceptible to benzene poisoning. Menorrhagia, in the absence of malignancy or endometrial abnormality, is a rare complication of the climacteric (Hamblen, 1939). We found 7 out of 43 women (16.2%) of the appropriate age group to be suffering from menorrhagia. This figure of incidence is higher than one would expect from a rare complication, but, as no attempt was made to exclude local disease of the uterus as a cause of the menorrhagia, it cannot be said definitely to be the result of increased susceptibility to benzene; it may, however, be suggestive. It should also be noted that the average polymorph count in these women (3,059 per c.mm.) is lower than in the younger women (3,603 per c.mm.).

There is no agreement in the literature about the subjective symptomatology of the climacteric. Norris (1919) states that 90% of healthy women experience no severe symptomatic disturbance; Hawkinson (1938), however, expressly states that 75% of all women suffer from distressing symptoms during this period. The personal factor is of course difficult to assess. Twenty-four of the 43 women examined (55.8%) complained of one or more of the following symptoms—lassitude, headache, giddiness, and menorrhagia—any of which may have been due to the climacteric or to the absorption of benzene. As this figure falls nicely between the two quoted, it cannot be said to indicate that benzene workers show more disturbance during the menopausal period.

The length of exposure to the fumes of rubber solution ought to be related directly to the neutropenia which has been shown to develop—that is, the longer the exposure the more marked should be the resulting fall in the polymorph count. An attempt was made to demonstrate this with the figures at our disposal, but it appeared that 59% of the women had been exposed for one year or less, and only 13% for a period between 2½ and 3 years. The average polymorph counts for these two groups were 3,163 per c.mm. and 3,445 per c.mm. respectively. As this last figure was calculated from only 26 women it is impossible to say that it presents a true picture of the whole population so employed. If, for argument's sake, it is assumed that the length of exposure does not increase the neutropenia, and therefore does not increase the risk to the worker, it would still have to be shown that the polymorphonuclear count returned to normal with rest after three years' exposure as well as after one year's exposure. Unfortunately all our figures for recovery were obtained on women with only six months' exposure, and at the moment none are available in respect of those with longer exposure.

The figures in the second part of the investigation, dealing with the changes in the blood counts after removal from

exposure to the solution, speak for themselves. After periods of rest up to three months the polymorph and white cell counts have risen and lie within normal limits. In the three women who were again exposed the counts very soon dropped. This observation, taken in conjunction with the previous observation that a lowering of the polymorph count is the earliest and most constant indication of benzene absorption, immediately suggests a method of controlling the absorption—particularly since, as already shown, there is no relation between symptoms and neutropenia. We would suggest that white cell counts should be done on all workers after an initial exposure of, say, six months; and that any who show neutropenia should be transferred to other work and recounts made after two months. If the count is then within normal limits the woman can be put back on her original work for a further period of six months and then be retested. If, however, there is no improvement in the count after the "rest" period the affected woman should be advised to give up work with benzene altogether, as it is possible that her bone marrow may be permanently depressed.

### Conclusion

The toxic effects of the aromatic hydrocarbons (chiefly benzene) used in rubber solutions make the above precautions highly desirable. The substitution of a relatively non-toxic solvent such as solvent naphtha would render haematological control of the worker unnecessary; but so long as benzene is used it is advisable that the persons exposed should be given the protection of routine blood examinations. It may be noted that as the result of representations by the Factory Department the aromatic content of the rubber solutions used in this process has been limited to not more than 5% as one of the preventive measures required.

The question as to how the women with lowered polymorph counts react to infection is obviously important, and is one which we have not enough data as yet to answer. If the injury to the bone marrow is such that it does not recover with rest, it may be that infection will also be an insufficient stimulus to leucocytosis, and the patient thereby be deprived of an important defence mechanism.

The excretion of increased amounts of organic sulphates in the urine is a feature of severe benzene poisoning, but in this investigation no definite changes were found in people who clinically and haematologically showed definite early signs of the malady. It would seem, on the basis of this study, that benzene will produce haematological changes before it is excreted in significant amounts.

### Summary

The clinical and haematological pictures of 200 women working with industrial rubber solutions are compared with 200 control women. Neutropenia is shown to be the commonest and earliest sign of benzene absorption.

It has been shown that there is no correlation between the symptoms complained of and the onset of haematological changes. This is important because clinical examinations alone are probably useless for the specific detection of early cases; but of course they have great value in the diagnosis of cases of deterioration in health due to other causes.

A possible method of preventing the onset of chronic benzene poisoning by regular white cell counts and suitable periods of "rest" is suggested.

### REFERENCES

- Clegg, J. W., and King, E. J. (1942). *British Medical Journal*, 2, 329.  
 Dimmel, H. (1932-3). *Arch. Gewerbepath. Gewerbehyg.*, 4, 414.  
 Feil, A. (1933). *Presse méd.*, 41, 129.  
 Goodfellow, D. R. (1935). *Brit. J. Radiol.*, 8, 752.  
 Hamblen, E. C. (1939). *Endocrine Gynaecology*, p. 187, Springfield, Ill., and London.  
 Hamilton, A. (1925). *Industrial Poisons in the United States*, New York.  
 Hamilton-Paterson, J. L. (1941). *Lancet*, 1, 73.  
 Hawkinson, L. F. (1938). *J. Amer. med. Ass.*, 111, 390.  
 Kammer, A. G., Isenberg, N., and Berg, M. E. (1938). *Ibid.*, 111, 1452.  
 Kober, R. (1906). *Lehrbuch der Intoxikationen*, 2, 926, Stuttgart.  
 Meda, G. (1922). *Med. Lavoro*, 13, 264. Quoted by Browning, E.: *Toxicity of Industrial Solvents*, H.M. Stationery Office, London, 1937.  
 Norris, C. C. (1919). *Amer. J. Obstet. Gynec.*, 79, 767.  
 Peters, J. P., and van Slyke, D. D. (1932). *Quantitative Clinical Chemistry*, 2, 892, Baltimore and London.  
 Piney, A., and Hamilton-Paterson, J. L. (1943). *Sternal Puncture*, 2nd ed., London.  
 Schrenk, H. H., Yant, W. P., and Sayers, R. R. (1936). *J. Amer. med. Ass.*, 10, 849.  
 Smith, A. R. (1928). *J. Industr. Hyg.*, 10, 73.  
 Whitby, L. E. H., and Britton, C. J. C. (1942). *Disorders of the Blood*, 4th ed., London.  
 Yant, W. P., Schrenk, H. H., Sayers, R. R., Horvarth, A. A., and Reichenbach, W. H. (1936). *J. Industr. Hyg.*, 18, 69.

# THE SULPHONAMIDES IN OPHTHALMIA NEONATORUM

BY  
ARNOLD SORSBY, M.D., F.R.C.S.

AND  
ELIZABETH L. HOFFA, L.R.C.P.&S.Ed.  
(White Oak (L.C.C.) Hospital)

In an earlier communication (Sorsby, Hoffa, and Smellie, 1942) an account was given of the value of the administration of sulphapyridine in 273 cases of ophthalmia neonatorum treated at White Oak Hospital from towards the end of 1939 till Dec. 31, 1941. By comparison with 46 cases treated by the classical local methods, it was concluded that the results obtained with sulphapyridine justified the description of the new method of treatment as a revolutionary advance and that the classical methods of local therapy no longer had any place in the treatment of ophthalmia neonatorum. It was also shown that sulphapyridine proved as effective in non-gonococcal ophthalmia as in the gonococcal variety. The present paper deals with a further 258 cases (out of a total of 269) seen between Jan. 1, 1942, and Dec. 31, 1943. Of the 258 cases, 133 were treated with sulphapyridine, 43 with sulphathiazole, 28 with sulphamezathine, 31 with sulphadiazine, and in the residual group of 23 more than one of these sulphonamides were used as the cases proved resistant or intolerant to the drug employed initially. The results of treatment are set out in the following table.

TABLE I.—Comparative Results of Some Sulphonamides in Ophthalmia Neonatorum

Clinical Cure	Sulphapyridine			Sulphathiazole			Sulphamezathine			Sulphadiazine			Two or More of these Four			Total		
	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total
1 to 3 days	15 (48.5%)	26 (25.5%)	41 (30.8%)	7	7	14 (32.5%)	3	8	11 (39.3%)	5	5	10 (32.3%)	1	1	2 (4.3%)	31 (51.7%)	46 (23.2%)	77 (29.9%)
" 4 to 7 days	13 (41.9%)	64 (62.7%)	77 (57.9%)	4	22	26 (60.5%)	2	13	15 (53.6%)	4	12	16 (51.6%)	—	10	10	—	—	—
" 8 to 14 days	3 (9.6%)	12 (11.8%)	15 (11.3%)	—	—	—	—	—	—	—	—	—	2	7	9	—	—	—
Over 14 days	—	—	—	—	—	—	—	—	—	—	—	—	1	2	3	—	—	—
Totals	31	102	133	11	32	43	5	23	28	9	22	31	4	19	23	60	198	258

\* Including relapses after an apparent clinical cure.

This table confirms the earlier findings as to the efficacy of sulphapyridine both in gonococcal and in non-gonococcal ophthalmia. As was indicated in the earlier study, the results there recorded had to be regarded as an understatement of the value of this drug, for many of the earlier cases received a dosage that later on was recognized as less than the optimum. For this reason it is possible to classify the present data, collected on the basis of uniform dosage, rather more finely than the earlier series: the clinical cures obtained within 8 days are now shown as those achieved within 1 to 3 days and those taking 4 to 8 days. It will be seen from Table I that 85.7% were cured within 8 days (as against 61.9% in the earlier series) and that no fewer than 29.9% were cured within 3 days.

## Relative Value of the Different Sulphonamides

As to the relative value of the various sulphonamides, the only substantial study on the subject has come from Wong (1942), who found that on the average sulphanilamide effected a cure in 7.2 days in 20 cases of gonorrhoeal ophthalmia, while sulphapyridine was effective in 4.8 days in 10 cases and sulphathiazole in 3.4 days in a further series of 10 cases. The results recorded here do not cover a sufficiently large number of cases to allow fine distinctions to be drawn. However, it does not appear that any one of the four sulphonamides studied gives strikingly different end-results. Sulphadiazine has the advantage of being the best-tolerated of these four drugs, and sulphamezathine is probably as good. It is possible—but this requires confirmation—that sulphathiazole, while gratifyingly effective in such cases as respond

to it, is apt to be more selective in effect. Sulphapyridine is probably the least satisfactory owing to its greater tendency towards toxic manifestations; for the present, at any rate, its use as the routine drug has been discontinued.

Though the present series shows more favourable results than the previous one with its many early cases treated before a definite routine had been established, it is of some interest to summarize the findings in these two series, comprising together 531 cases (Table II).

TABLE II.—Results in 531 Cases of Ophthalmia Neonatorum treated by Sulphonamides (273 Cases published earlier and 258 in the Present Series) contrasted with the previously published 46 Control Cases treated locally by the Classical Methods

Clinical Cure	Local Treatment (Classical Methods)			General Sulphonamide Treatment		
	Gonococci-positive	Gonococci-negative	Total	Gonococci-positive	Gonococci-negative	Total
Well in 8 days	2	5	7 (15.2%)	97 (73.0%)	293 (73.6%)	390 (73.4%)
" 9 to 30 days	6	21	27 (58.7%)	26 (19.5%)	96 (24.1%)	122 (23.0%)
" more than 30 days	7	5	12 (26.1%)	10 (7.5%)	9 (2.3%)	19 (3.6%)
Totals	15	31	46	133	398	531

## Gonococcal and Non-gonococcal Cases

In the previous series the incidence of gonococcal infection was 27.3% (89 cases in a consecutive series of 322). In the total present series of 269 cases it constituted 23.8% (64 cases).

The ophthalmia was confined to one eye in 89 instances, or 33.0%—a close approximation to the incidence of 30.5% observed in the previous series. The difference in unilateral incidence as between gonococcal and non-gonococcal ophthalmia is not great, being 28.1% (18 out of 64 cases) in gonococcal ophthalmia and 34.1% (70 out of 205 cases) in non-gonococcal ophthalmia.

The present evidence suggests that, while the sulphonamides are effective in non-gonococcal ophthalmia as well as in ophthalmia due to the gonococcus, rather quicker cures are obtained in the gonococcal variety. Cures within 3 days were obtained in 51.7% of gonococcal cases, against 23.2% in non-gonococcal cases (in 31 out of 60 cases and in 46 out of 198 cases respectively). In both groups the bulk of cases did not require treatment beyond 8 days, 90.0% of all gonococcal cases and 84.3% of all non-gonococcal cases, which included organismal, non-organismal, and the inclusion varieties of ophthalmia neonatorum, having become resolved by that time.

## Delay in Initiating Treatment, and Protracted Cases

As in the earlier series, delay in starting sulphonamide therapy did not affect its efficacy: 85 cases first received sulphonamide treatment after the infection had been established for more than 8 days; these cases responded as well as the 173 less-established infections did. Seven cases had corneal ulcers (all unilateral) on admission. They all cleared quickly and well, leaving hardly perceptible or no scars, and in no case did a corneal ulcer develop while treatment was being given, though a number of infants had hazy cornea on admission.



In cases that take longer than 8 days for cure sulphonamide treatment is generally not needed, as the affection is no longer one of purulent ophthalmia but of a rather resistant conjunctivitis with some muco-pus. The proper treatment of such cases is still a matter of doubt; some, at any rate, are best left alone. In one case (non-gonorrhoeal) profuse purulent discharge continued for nearly a month in spite of intensive treatment with the various sulphonamides. In another, also non-gonococcal, a false membrane formed on the palpebral conjunctiva of the two lids of one eye, and is disappearing only now, three months later; all active treatment was suspended at the end of the first month, and at no time was there any apparent danger to the cornea.

Few relapses have been seen in the present series, and this is perhaps due to the greater initial dosage (0.25 g.) and maintenance dosages of 0.125 g. four-hourly, not only during the active phase of the affection but for three days after apparent clinical cure. Apart from minor toxic effects no untoward results were observed.

### Causal Organisms

The 198 non-gonococcal cases in the present sulphonamide series included 50 in which pus cells only, but no organisms, were found, 52 with various bacilli (mostly diphtheroids), 88 with staphylococci, and 8 with other coecal organisms. Inclusion bodies were found 27 times; they occurred twice in association with organisms and 25 times in cases in which no organisms could be found. The actual distribution of the various organisms in this series, taken together with the 11 cases not treated by sulphonamides (but by newer methods of local therapy), is shown in Table III, which includes comparative figures from the previous series.

TABLE III.—Differential Incidence of Organisms in 269 Consecutive Cases of Ophthalmia Neonatorum treated in the Period Jan. 1 1942, to Dec. 31, 1943, with Comparative Findings for 322 Cases seen during Sept., 1939, to Dec., 1941

	Sept., '39, to Dec., '41	Jan., '42, to Dec., '43	Total
No organism found in smear or culture	53	51	104
Gonococcus	89	64	153
Staphylococcus:			
Staphylococci	56	48	
and diphtheroids	25	20	
Staphylococcus albus	17	13	
Staphylococcus aureus	13	11	
Other coecal organisms:			
Gram-positive cocci	6	2	
Meningococci	3	2	
Pneumococci	3	2	
Streptococcus haemolyticus	2	3	
Streptococcus viridans	1	—	
Micrococcus catarrhalis	2	—	
Micrococcus tetragenus	2	1	
Bacilli:			
Diphtheroids	20	31	
Koch-Weeks	8	2	
Coliform	6	2	
Gram-positive	3	1	
Gram-negative	3	10	
Xerosis	3	—	
Morax-Axenfeld	3	3	
Hoffmann	2	—	
Friedländer	1	4	
Total	322	269*	591

\* Inclusion bodies found 27 times: twice in association with organisms and 25 times without organisms.

### Summary

In the earlier series of 273 cases of ophthalmia neonatorum treated by the oral administration of sulphapyridine, 61.9% showed clinical cure within 8 days.

In the present series, in which a standard dosage was used in 258 cases, 133 were treated with sulphapyridine, 43 with sulphathiazole, 28 with sulphamezathine, and 31 with sulphadiazine; two or more sulphonamides were used in the remaining 23 cases, which were either resistant or intolerant to the sulphonamide used initially. In these 258 cases clinical cure was obtained within 8 days in 85.7%.

A high proportion of cases (29.9%) showed clinical cure within 3 days; 55.8% required from 4 to 8 days for clinical cure; and 14.3% showed a protracted course.

There was no appreciable difference in the action of the four sulphonamides used. Clinical cures within 8 days were obtained in 88.7% of cases treated with sulphapyridine, 93.0% of those treated with sulphathiazole, 92.9% of sulphamezathine cases, and 83.9% of

sulphadiazine cases. Sulphapyridine, because of its greater toxicity, appears to be the least desirable of these sulphonamides.

Gonococcal cases responded more rapidly to sulphonamide therapy than did the non-gonococcal cases; 51.7% of the 60 gonococcal cases showed clinical cure within 3 days, against 23.2% of the non-gonococcal cases. By the end of 8 days 90.0% of all gonococcal cases and 84.3% of non-gonococcal cases were clear.

In the present series inclusion bodies were found in 27 instances: twice in association with organisms and 25 times without such association. These cases responded well to sulphonamide therapy.

Only exceptionally is a case completely resistant to sulphonamide therapy. It is more a matter of sluggish response than of total resistance.

The routine at White Oak Hospital now includes administration of the sulphonamides for 3 days after clinical cure; fewer relapses are now observed.

We are indebted to Dr. E. N. Young of the Southern Group (L.C.C.) Laboratories for her painstaking bacteriological examinations. We are also obliged to Dr. G. Heister, and to the Matron and Sister Condon of White Oak Hospital, for their collaboration.

### REFERENCES

- Sorsby, A., Hoffa, E. L., and Smellie, E. W. (1942). *British Medical Journal*, 1, 323.  
Wong, R. T. (1942). *Arch. Ophthalmol.*, Chicago, 27, 670.

## THE BLOOD PRESSURE IN MIDWIFERY

BY

WALTER RADCLIFFE, M.B., B.Chir.

A study of the blood pressure during the later months of pregnancy is a recognized part of adequate ante-natal care, yet often it is neglected as soon as labour begins. This is all the more surprising since the value of blood-pressure records has been well established on the operation table and in the prevention and treatment of traumatic shock, and the same influences—drugs, haemorrhage, and trauma—are present to some extent in most labours.

The literature on this subject is very scanty; the most useful articles in the English language are those by Cook and Brigg (1903), Bailey (1911), Donaldson (1913), Schwarz (1923), Simon and Rasmussen (1925), and Matthews (1939). The subject is also practically ignored, apart from mentioning the blood pressure in eclampsia and toxæmia, in all the recent textbooks on midwifery that I have seen.

I have made records of the blood pressure, both systolic and diastolic, in all my midwifery for over two years, and I find them very instructive in assessing the effects of management and treatment, especially analgesia and anaesthesia. The technique is simple and well within the scope of the general practitioner, even when working alone. The chief difficulty arises when the doctor is distracted from the mother to attend to urgent foetal asphyxia, for it is at this time during the third stage of the labour that the most important changes in blood pressure take place. I firmly believe that, if more attention were paid to the blood pressure incipient shock would be recognized earlier while still amenable to simple treatment, and the lives of many of our mothers would be saved.

### Types of Blood-pressure Curve

The first problem to be solved is that of the normal—that is to say, the blood-pressure curve in a straightforward delivery uninfluenced in any way by drugs or obstetric manipulations. It has been stated by Halls Dally (1936) that "during labour there is a progressive elevation of blood pressure, even to considerable heights as the pains become more intense, reaching a maximum as the head of the infant is expelled. After delivery the pressure rapidly falls." In my experience this description is very misleading, and there is far less disturbance of blood pressure than one would suppose.

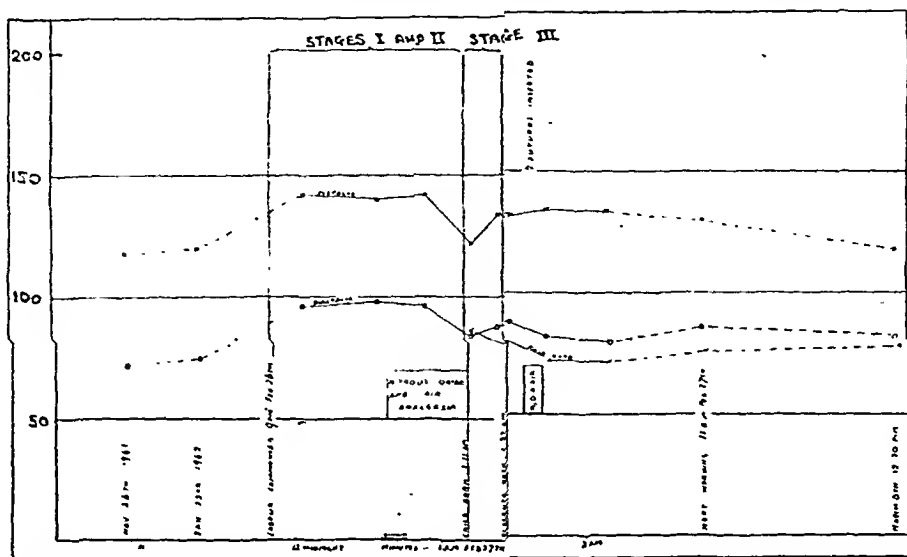
Graph A is a typical blood-pressure curve, and probably approximates to the normal, even though nitrous oxide analgesia was given towards the end of the second stage. Exactly similar curves are recorded when no form of analgesia is given, and also when the agent used is weak chloroform or trichlorethylene. I will be seen that in labour there is a rise of about 20 mm. H followed by a short-lived fall after delivery, partly due to reduced pulse pressure, but also shown in the diastolic pressure as well. This particular case the blood pressure as the head was being born was not recorded, but I have rarely found it much higher.

after delivery the blood pressure rises again, and this coincides with the return of uterine contractions. After the first day there is a gradual fall during the puerperium, but Donaldson (1913) has pointed out that this fall is no more than one would expect to find in any patient who was confined to bed.

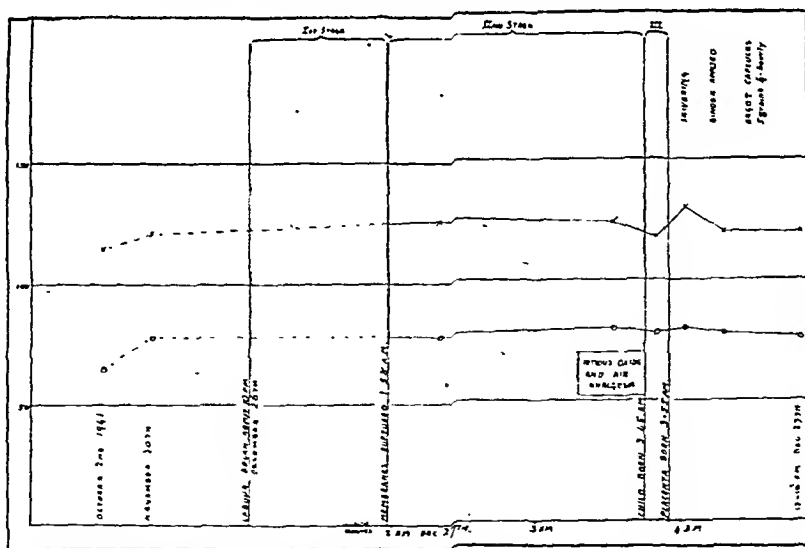
I have recorded not only the systolic pressure but also the diastolic, and no account has been taken of the rise in pressure during pains, the recorded figures being taken only between each contraction. Although it may not be strictly accurate, I have assumed for all

delivery is also negligible, but soon afterwards there is a sharp increase in the pulse pressure. In my experience such an increased pulse pressure soon after delivery invariably coincides with a sharp bout of shivering. This is an observation which, so far as I am aware, has not previously been made, but I think it is of considerable importance in explaining the changes which take place in the third stage of labour.

A theory has been handed down from the time of William Smellie that the sudden emptying of the uterus at birth tends to cause



GRAPH A.—Primipara aged 23. Labour Feb. 26-27, 1942. R.O.P. rotating spontaneously to R.O.A. Dry labour. No drugs given other than  $N_2O + O_2$ . Full-term male child, 6½ lb.



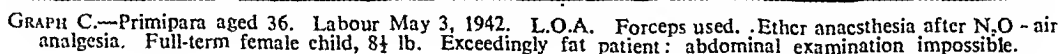
GRAPH B.—Primipara aged 23. Labour Dec. 26-27, 1941. Persistent R.O.P. Full-term female child, 7 lb.

practical purposes that the diastolic pressure is a measure of the peripheral resistance to the circulation, and therefore an index of the vasomotor tone, and that the systolic pressure represents the sum of this peripheral resistance plus the pulse pressure, representing cardiac output. In studying these records I would stress the value of the diastolic pressure, and point out that the systolic pressure alone tells us only part of the story.

Graph B is a second type of blood-pressure curve, and is nearly as common as the first example. In this type there is very little or no increase in the blood pressure during labour, and the fall after

collapse. His pupil, John Harvie (1762), described it as "too great quantity of blood rushing into ye relaxed vessels of ye abdominal contents, whereby ye head is robbed of its due proportion, and dangerous faintings ensue." This phenomenon was thought comparable with the collapse which sometimes follows paracentesis abdominis. To it has been attributed not only obstetric shock but also the fall in systolic pressure (Cook and Briggs, 1903) and the shivering bout (Phillips, 1931). It is interesting to note that the splanchnic pool theory of shock has only recently been discarded. Bailey (1911) was the first to doubt the theory, and suggested that

Graph E affords, a marked contrast, for although there was a small post-partum haemorrhage, the picture was completely overshadowed by shock, shown by faintness, giddiness, and a cold perspiration, and a very severe drop in both the systolic and the diastolic pressure to 80/60 mm. Hg, which is within the limits described by Hewer (1943) as critical hypotension. Fortunately energetic treatment brought about a prompt recovery. A point of practical importance arises in such cases; it will be seen that no attempt to repair the perineum was made until the blood pressure had been restored to normal limits, and then a local anaesthetic was used in preference to a general one rather than run any risk of upsetting the vasomotor balance again. It has been pointed out by Miles Phillips (1931) that even the small amount of trauma caused



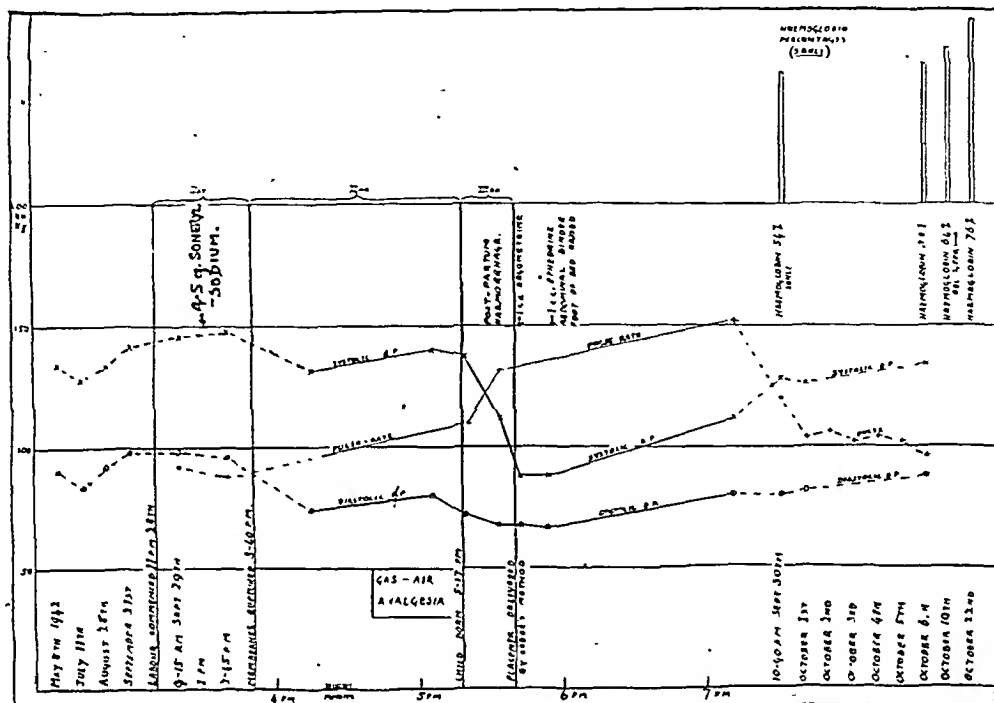
Apart from example C, in which a mild degree of toxæmia before labour is shown to have responded rapidly to treatment, I have

A valuable clinical lesson which may be learnt from these records is the depressant effect of drugs used for analgesia and anaesthesia. The barbiturates are the worst offenders, and a drop of 20 mm. Hg, both systolic and diastolic, is commonly recorded after the normal doses. Graph C is an example of such a fall after the use of nembutal, and I have seen just the same after seconal. This graph, in addition, shows well the effect of prolonging ether anaesthesia, given in the first place for low forceps, through the third stage of labour to cover a small perineal repair operation. While it is well known that chloroform anaesthesia produces such hypotension, it is not always realized that ether does so too once the initial stimulant effect has passed off. The importance of hypotension under anaesthesia as a precursor of shock has recently been stressed in an article by Dodd and Prescott (1943). If such hypotension can be demonstrated in the mother, what must be the effect on the foetal circulation? Among the causes of foetal asphyxia anaesthetics and analgesic drugs administered to the mother play a very considerable part (Shaw, 1943). One is justified, I think, in assuming that any depression of the maternal circulation must be reflected in that of the foetus, at least up to the moment when independent respiration begins. Further research along these lines might lead to a reduction in the stillbirth rate.

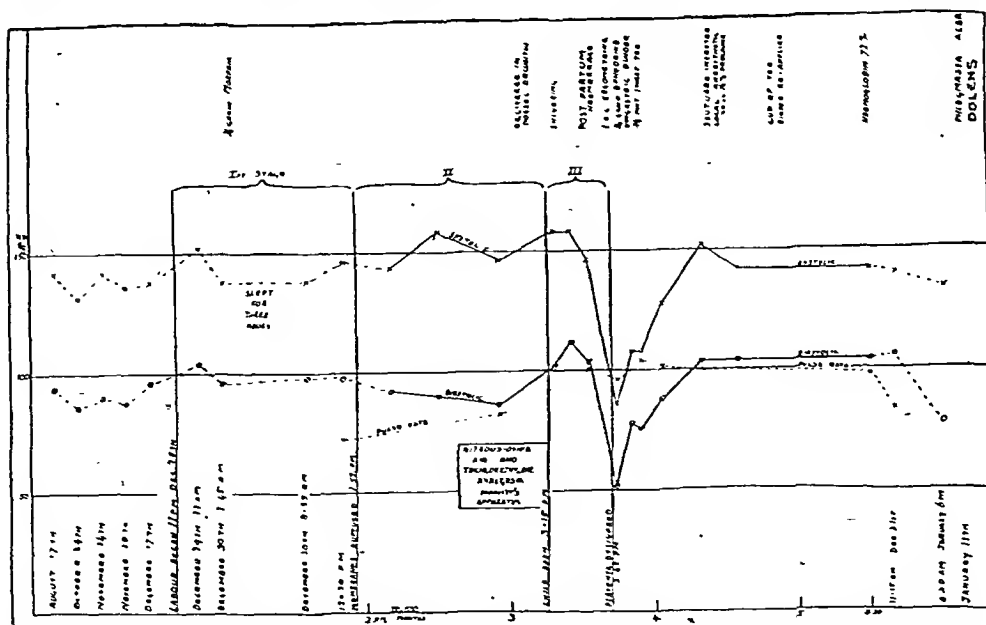
given no examples of the blood-pressure changes in toxic cases. I consider myself fortunate in not having seen an eclamptic fit in twelve years of practice. This aspect of the subject is fairly well covered in the literature, especially in papers by Hirst (1910), Bailey (1911), Bailey and Driscoll (1926), and Adair, Hunt, and Arnell (1936). The last-named authors have been so impressed by the grave danger of shock in toxic elderly multiparae that they have coined the very graphic expression "vascular collapse" for this association.

# Conclusion

There are thus many practical lessons to be learnt even from my short series of about 40 cases. Obviously, since they produce such marked hypotension, the barbiturate drugs should be used only in the early stages of labour, and are best avoided within a short time of delivery. Also any hypotension which may be present during the third stage of labour is to be



GRAPH D.—Para-1 aged 34. Labour Sept. 28-29, 1942. L.O.A. Full-term male child, 7½ lb. Post-partum haemorrhage.



GRAPH E.—Primipara aged 26. Labour Dec. 28-30, 1942. L.O.A. N<sub>2</sub>O + air + trichlorethylene. Full-term male child, 6½ lb. Small p.p.h. Later developed phlegmasia alba dolens.

regarded as a danger sign, and the blood pressure should be restored before anything else is done, the only exception to this rule being the minimum steps necessary to stop haemorrhage. It is not always appreciated that in cases of traumatic shock the precipitating injury precedes the secondary factors, such as pain, exhaustion, drug depression, and injudicious rough handling, which join in to complete the clinical picture; whereas in labour most of these factors will have been present for some hours before the final trauma which determines and initiates shock. The ultimate state of shock is the same, but the sequence is different. When, therefore, a long and difficult labour is anticipated we have a particularly favourable opportunity of controlling these accessory factors, especially if we study the blood pressure.

I would therefore urge the general practitioner to use his sphygmomanometer at the bedside in his midwifery, and cannot do better than quote in support of my plea the words of Prof. Miles Phillips (1936), who made it his practice to do so, although he has not published his figures. Speaking before an American Association of Surgeons, he said: "Neither she nor her husband was concerned with the maternal mortality rate—only four, five, or six in a thousand—but they did expect you to take every precaution."

May I record my thanks to Mr. Shields, librarian of the British Medical Association, for his indefatigable help in supplying me with the available references.

## REFERENCES

- Adair, F. L., Hunt, A. B., and Arnell, R. E. (1936). *J. Amer. med. Ass.*, 107, 1036.  
 Bailey, H. C. (1911). *Amer. J. Obstet.*, 64, 260.  
 — and Driscoll, W. F. (1926). *Amer. J. Obstet. Gynec.*, 11, 287.  
 Cannon, W. B. (1929). *Bodily Changes in Pain, Fear, Hunger and Rage*, New York.  
 Cook, H. W., and Briggs, J. B. (1903). *Jahns Hap. Hosp. Reps.*, 11, 451.  
 Dally, J. F. Halts (1936). *Brit. Ency. med. Pract.*, 2, 505, London.  
 DeLee, J. B. (1938). *Principles and Practice of Obstetrics*, Philadelphia.  
 Dodd, H., and Prescott, F. (1943). *British Medical Journal*, 1, 345.  
 Donaldson, M. (1913). *J. Obstet. Gynec. Brit. Emp.*, 24, 133.  
 Harvie, J. (1962). Manuscript Lectures at the Liverpool Med. Inst. Library.  
 Hewer, C. L. (1943). *Recent Advances in Anaesthesia*, p. 215, London.  
 Hirst, J. C. (1910). *N.Y. St. J. Med.*, 91, 1204.  
 McDowall, R. J. S. (1941). *British Medical Journal*, 2, 41.  
 Matthews, H. B. (1939). *J. Amer. med. Ass.*, 113, 1183.  
 Moir, Chassar (1933-4). *Trans. Edinb. obstet. Soc.*, 54, 93.  
 Phillips, Miles (1931). *British Medical Journal*, 1, 833.  
 — (1936). *Trans. Amer. Ass. Obstet. Gynec. abd. Surg.*, p. 14.  
 Schwarz, O. H. (1923). *Amer. J. Obstet. Gynec.*, 6, 155.  
 Shaw, Wilfred (1943). *Textbook of Midwifery*, p. 493, London.  
 Simons, E. J., and Rasmussen, C. C. (1925). *Minnesota med. J.*, 8, 303.  
 Wiggers, C. J., and Werle, J. M. (1942). *Amer. J. Physiol.*, 136, 421.

## NERVOUS BREAKDOWN IN THE NAVY DOMESTIC DIFFICULTIES AS A CAUSAL FACTOR

BY

GEOFFREY TOOTH, M.B., B.Ch., D.P.M.

Temp. Surg. Lieut.-Cmdr. R.N.V.R.; Neuropsychiatric Specialist;  
late Assistant Medical Officer at the Maudsley Hospital

While it is generally agreed that prolonged psychotherapy has no place in the treatment of psychiatric casualties in the Services in wartime, this need not mean that the psychiatrist should concern himself only with diagnosis and institutional efforts at rehabilitation. In this paper the part played by the domestic affairs of the sailor in determining the onset and gravity of nervous breakdown is considered and suggestions are made for investigating and treating these difficulties more effectively. Psychological motivation is said (Kretschmer, 1934) to be due to combinations of causes, of which the least socially and morally acceptable possesses the greatest driving force and is furthest removed from consciousness, whereas that which the patient considers to be the most easily acceptable is in the forefront of consciousness and is the manifest cause of any reaction. Wartime propaganda is directed towards assigning to patriotism and devotion to duty the highest ethical values and stressing the subordination of the individual and the family to the State. In this present struggle, waged by conscript armies and navies, such a fundamental change of outlook might well give rise to conflicts, of which the most potent cause need not be the most obvious.

### Actiological Classification of Naval Psychiatric Material

In classifying the causal factors in mental illness it is usual to make a broad distinction between those that are determined mainly by the personality of the patient and those that are chiefly environmental. Though it is seldom possible to make a

rigid distinction between endogenous and exogenous, yet for purposes of treatment and prognosis it is almost essential to divide the facts of the history in this way. Exogenous factor can be considered as forming a graded series, the members of which will vary in their closeness to the centre of the patient's personality. On theoretical grounds it would be reasonable to assume that those factors which most intimately affect this hypothetical nodal point of the personality would have the greatest strength in causing a nervous breakdown: the effect of domestic trouble are explicable on this basis.

Wartime psychiatry is greatly simplified because the individual environmental stresses in war are much more constant than they are likely to be in peacetime; for example, the living conditions of a sailor in his ship, which may be his home for years at a stretch, are so invariable as to be comparable to those artificially produced in a psychological laboratory. The effects of stress are evenly distributed throughout the ship's company, and, although there are differences in responsibility among the various ranks and ratings, so far as exposure to what are usually termed "the hazards of life afloat" are concerned all can truly be said to be in the same boat. The realization of this has led to the conception that the breakdown of a small percentage of a ship's company following an action is an indication of the poor morale of those who succumbed, and because the majority stood up to the test, cannot be attributed to the conditions of the action. In some cases this may be true but it is probable that this assumption accounts for only a small number of the men who break down under the stress of action.

On the basis of the observation of fairly large numbers of these cases, it appears more likely that unfavourable reactions to stress are due, in order of frequency, to the following causes: (1) constitutional weakness of the personality; (2) combinations of environmental factors; (3) simple bad morale, in the sense of "yellowness" or lowered social responsibility. It is with the second of these groups that this paper is chiefly concerned.

### Effects of Stress

By the time a man becomes a frank psychiatric casualty, unless he belongs to the low-morale group, he has usually had to readjust or repress his former scale of ethical values, and the ease with which he does this depends upon his personality. Both in the last war and in this it has been noted (Beaton, in *The Naval Medical History of the War*; Curran and Mallinson, 1941) that the better types suffer affective changes in the direction of either depression or elation, usually combined with anxiety, whereas their less meritorious messmates react with hysterical symptoms. It has been observed, moreover, that affective disturbances in good personalities, when they are due to the effects of war service uncomplicated by other factors, respond surprisingly well to ordinary hospital conditions. It is those cases in which the causal factors are multiple that sometimes present unusual clinical states and, on the whole, do badly. In the Services, the return of a man to duty is a fair measure of the success of treatment; invaliding usually implies failure, and the invaliding rate may be regarded as an indicator of the virulence of a condition.

In the Navy there appear to be two groups of exogenous factors, which are not directly connected with the hazards of war: (a) the conditions and type of service, including reactions to authority, disappointments over promotion or the lack of official recognition of services, and other specifically Naval determinants; (b) domestic difficulties. Of these two groups the former is the commoner; but the latter, as will be shown, can give rise to the most virulent and intractable reactions, leading to invaliding in a high proportion of cases.

The home life of the sailor has been the subject of ribaldry and a cause of unhappiness for as far back as the lives of seagoing men are recorded. Among sea-faring peoples the subject has become part of the national mythology; it is not recorded that Jason or Ulysses suffered from anxiety states, but their behaviour on landing after long voyages showed considerable apprehension as to what might have happened at home in their absence, and the Norse sagas abound with references to these additional hazards of sea life. The Admiralty has evidently given much thought to this matter, and in peacetime every effort is made to enable the sailor to lead a double life with the minimum of discomfort and disruption of his material home.



But in wartime, although opportunities for reunion with the family are given whenever possible, many men must be separated from their homes for long periods. It is hardly surprising that such unusual conditions should sometimes lead to difficulties. I have had the opportunity of observing the results of these factors under two widely different conditions—for the first eighteen months of the war on the South Atlantic station, and for the past two years in a Naval hospital at home.

The total number of cases seen during the first period was too small to be of use for statistical analysis, but those seen during 1942 are given in the following table. In order to reduce any effect due to personal bias the figures are taken from the returns of two separate Naval hospitals and represent the combined opinions of at least five different psychiatrists. Only those cases are included in which the aetiological factors were quite definite, and these form, of course, a small proportion of the total number seen during the year.

Number of Cases during 1942

Aetiological Factor	Returned to Duty	Invalided	Proportion Invalided
Domestic difficulties ..	58	32	35.6%
Enemy action (E) ..	137	56	29.0%
Conditions of service (C)	89	26	22.6%
Total .. ..	284	114	28.6%

It will be seen from these figures that the percentage of men invalided from the group in which domestic trouble was the main causal factor is higher than in the other groups. The difference is not quite significant. Bearing in mind that a man is not invalided on compassionate grounds but because he shows symptoms of mental illness and is medically unfit for further service afloat or ashore, even though he may be in part responsible for his home difficulties, it is clear that domestic worry is at least as effective a factor as exposure to enemy action in causing breakdown leading to invaliding.

Where two or more factors, of which one is domestic trouble, are combined, the virulence of the reaction is considerably higher than when domestic worries alone are responsible. The following table illustrates this point, and the difference between the groups is significant, although the numbers are small.

Aetiological Factor	Returned to Duty	Invalided	Proportion Invalided
Domestic difficulties alone ..	37	12	24.4%
Domestic + E or C ..	21	20	45.7%
Total .. ..	58	32	35.6%

Although this observation might appear to be self-evident, it helps to explain some puzzling clinical pictures. It is a common experience for men to be sent into hospital with a psychiatric diagnosis and a history of exposure to enemy action which may be more or less recent; the history points to war experience as the cause of their breakdown, and the patient is often content, for various reasons, to allow it to be thought that this is the whole story. It is only after the condition has failed to respond to the usual treatment that a more thorough investigation and the interviewing of relatives reveal a sometimes long-standing anxiety over domestic affairs, to which war service has merely served as a catalyst in precipitating a psychopathological reaction.

The early recognition of the cause is of some importance both for treatment and in the assessment of attributability; for in these cases, if war service alone is considered responsible, the patient may become eligible for a pension. The following record illustrates this type of case:

*Case 1.*—A stoker petty officer, aged 32, with a previously stable personality and a clear record of twelve years' Naval service, had been abroad since Dec., 1940. He had been involved in the evacuation of Greece and Crete, and was subsequently employed in running supplies to Tobruk until Nov., 1941. He stood up to this long and continuous spell of hazardous work without feeling any ill effects, and carried on until Nov., 1942, when, following the loss of some merchantmen in the convoy his ship was escorting, he broke down and was admitted to hospital in Jan., 1943. On examination he was very depressed and agitated, and blamed the long spell of sea service for his condition. He made no mention of home worries, but in

an interview with his sister the following facts came to light. In 1939 he had married against the wishes of his family, and was very devoted to his wife, who during the time he had been abroad had been sharing a flat with her sister, of whom the patient did not approve. Towards the end of 1941 she had written asking his permission to adopt the alleged illegitimate son of this sister by a foreign sailor, and to this the patient raised no objection. There was a hitch in the adoption proceedings when the man who had been, unbeknown to himself, cited as the father of the child proposed to the alleged mother and was accepted by her. As this might have led to a difficult family situation, fresh adoption papers had to be taken out and the name of another man given as the father. It was at this stage of the proceedings that the patient returned home, and, although he gave no indication of suspecting his wife of double-dealing, there was no doubt from his letters to her that he was extremely worried about the whole affair. The true facts, as attested by the patient's sister, were that the child was born to the patient's wife during his absence.

A welfare society was supplied with the facts of the case but took no action, which, considering the complexity and delicacy of the situation, was hardly surprising. At no time could the problem of the parentage of the child be discussed with the patient or his wife, but, no doubt relieved by the prospect of going home for good, he improved sufficiently to be discharged from hospital, and was invalided.

It is possible that, as the result of his war experience, this man would have broken down in any case, but it seems more likely that the sense of insecurity and anxiety over his home affairs was the primary factor and that the war experience served as a face-saving device. His reticence and his unwillingness to face up to the realities of the domestic situation, of which he could hardly have been unaware, support this view.

#### Types of Domestic Trouble

An analysis of the types of domestic trouble that have led to breakdown shows that the real or suspected infidelity of a wife or fiancée heads the list by a clear margin, followed by the illness or death of near relatives, including the prospect of childbirth; financial stress and the more concrete situational problems appear to give little trouble. In this connexion it was observed that out of the 42 patients whose breakdown was attributed to domestic factors during the eighteen months from Jan., 1940, to July, 1941, on the South Atlantic station, anxiety due to enemy action at home was given by only one as the cause of his condition. This period includes, of course, the time during which the "blitz" of England was at its height. To explain this curious fact on the basis of "out of sight, out of mind" would probably be incorrect; it seems more likely that an anxiety shared by many is easier to bear and its virulence is in inverse proportion to the numbers who have to put up with it. This is possibly analogous to the rarity with which sea-sickness, from which so many of the sea-going population suffer, is given as the primary factor in breakdown. It also appears to be easier to accept philosophically the personal share of a common disaster when it is at a great distance than when, as in the case of home-based personnel, it is spatially close to them. Again, the relatively lower virulence of the effect of enemy action is probably due to the fact that it is rarely a solitary experience, and morale can therefore be built up against it. By contrast with these communal stresses, which may be said to affect only the periphery of the personality, the infidelity of a wife affects the husband's self-esteem and is aimed at its very centre.

#### The Need for Thorough Investigation

The record below illustrates the difficulties that may be encountered in the investigation of a case of this kind:

*Case 2.*—A South African stoker, aged 35, was admitted to hospital ship for the investigation of an intractable dyspepsia, which rendered him useless for duty. No organic abnormality was discovered, but the patient stated that he was very worried about the behaviour of his wife, who, he alleged, was living with another man, squandering his money, and neglecting his home and child. His story, which had some documentary support, was vouched for by the captain of his ship, who had already given him a spell of compassionate leave on the same grounds. On the strength of a recommendation backed by his commanding officer, the Commander-in-Chief granted a further period of leave to enable him to divorce his wife and arrange for the care of his child. On his arrival in Capetown, investigation by the chaplain at the base failed to confirm the man's story, and his subsequent desertion made it probable that the whole tale was a tissue of lies.

This case is instructive in showing the necessity for thorough social investigation, and also because it demonstrates how misguided would have been the alternative measure of invaliding such a man on the grounds of his dyspepsia.

#### Methods of Investigation

The inquiry into the circumstances and the treatment of such cases is by no means easy; under the existing system the divisional officer is responsible to his captain for the individual welfare of his men; this responsibility is shared to some extent by the chaplain in a big ship or at a shore base. That more men do not go sick from this cause under the exacting conditions of Naval service is a tribute to the efficiency of the system as much as to the stability of the men themselves. The introduction of airgraph letters and cheap cable rates has undoubtedly done much towards allaying the anxiety of men on foreign stations; nevertheless there does seem to be a need for a more specialized branch of social welfare organization to which complex and difficult cases could be referred, especially by the psychiatric specialists in depots, where such cases are usually first seen.

Much can be done, and is being done, by the existing welfare societies, but, since in peacetime it has been found necessary to employ specially trained workers in this field, the need can scarcely be less great in wartime. It is sometimes objected that the Englishman will not tolerate interference in his private affairs, but this prejudice is not borne out by personal experience or by the records of the psychiatric social services. The epic success of a follow-up of 100 families in which both parents had committed suicide marks a high level of achievement, and is a tribute to the workers who carried it out without a single rebuff. The growing demand for trained psychiatric social workers in clinics and voluntary hospitals is an indication that this kind of work is needed and can be effective.

It is possible that a further expansion of the social services—as, for example, by the appointment of a psychiatric social worker to Naval depots—might lead to a reduction in the invaliding rate from this cause. The work of the psychiatrists in hospitals and barracks would be greatly helped by such an arrangement, and it seems possible that the executive branch might also welcome assistance in carrying out what must be a difficult and time-consuming part of their duties.

#### Summary

The role of domestic difficulties in causing nervous breakdown in the Navy is compared with that of other aetiological factors; special note is made of the bad prognosis in these cases and in those in which there are multiple causal factors. The various types of home worry and the possible causes of its virulence are discussed. The need for thorough investigation is illustrated, and a suggestion is put forward for the enlistment of the services of psychiatric social workers to supplement the existing arrangements.

#### REFERENCES

- Beaton, T. *The Naval Medical History of the War*, Admiralty, London.  
Curran, D., and Mallinson, W. P. (1941). *British Medical Journal*, 1, 305.  
Kretschmer, E. (1934). *Textbook of Medical Psychology*, tr. E. B. Strauss, London.

## THE TONIC ACTION OF STRYCHNINE

BY

W. F. ANDERSON, M.D.

(From the Department of Materia Medica and Therapeutics,  
University of Glasgow, and Stobhill Hospital, Glasgow)

Strychnine is often used as the principal constituent of tonic mixtures. This custom is in part dependent on the belief that in therapeutic doses this drug has a beneficial action on the gastro-intestinal tract, promoting the appetite, rendering the digestive processes more efficient, and thereby increasing weight and general well-being. Strychnine, of course, in virtue of its taste has the action associated with simple bitters which reflexly increases the appetite and the flow of gastric juice. Therefore, in order to determine whether strychnine has any effects other than those due to the taste the drug should be given parenterally.

#### Experimental Findings

The present research was carried out with the view of finding whether strychnine administered parenterally had any action on

gastric digestion and whether any evidence could be obtained in support of its use as a tonic.

*Effect of a Single Dose of Strychnine on the Secretion of the Fasting Stomach.*—Four specimens of fasting juice were aspirated at 15-minute intervals. Thereafter 1/20 gr. of strychnine was injected subcutaneously and the juice again withdrawn during the succeeding hour. In four subjects with normal gastric acidity there was an increase both in the volume and in the hydrochloric acid content of the gastric juice after administration of the drug. In three patients with achlorhydria the strychnine failed to stimulate the secretion of hydrochloric acid or to alter significantly the volume of the secretion.

*Effect of a Single Dose of Strychnine on the Movements of the Fasting Stomach.*—Bennett (1923) stated that small doses of strychnine had a beneficial effect on gastric atony, and quoted Berti to show that as small a dose as 0.5 mg., given orally, caused increased gastric peristalsis. Dickson and Wilson (1925) also maintained that strychnine increases gastric motility. Bastedo (1936) stated that it increased the height of the hunger contractions. Clark (1940), on the other hand, affirmed that strychnine had no effect on gastric movements even when given in large doses. In the present investigation 1/20 gr. of strychnine hydrochloride was given after a period of at least five hours without food or water. Gastric motility was recorded by a modification of Carlson's balloon method (Anderson, 1943). In eight subjects the strychnine was given during a period of quiescence, and in each of them strong gastric contractions appeared after an interval of 5 to 15 minutes, and lasted from 20 to 45 minutes. The movements so produced were strong, and the interval between each wave tended to become shorter towards the end of the period of contractions. In two subjects the strychnine was given after a period of contractions had lasted 35 and 45 minutes respectively; in each case a prolonged period of quiescence followed the administration of the drug. The quiescent phase may have been due to fatigue of the gastric muscle.

*Effect of Continued Administration of Strychnine on the Response of the Gastric Secretions to a Test Meal.*—The subjects of this investigation were 2 men with a slight degree of hyperchlorhydria and 5 with achlorhydria. Strychnine hydrochloride gr. 1/30 was given subcutaneously three times daily for three to four weeks. Test meals were given before and at the end of the period of strychnine medication. In one patient with hyperchlorhydria the maximum percentage of hydrochloric acid was reduced, while in one achlorhydric a small amount of free hydrochloric acid appeared. In no other patient was there any significant change in the secretion of acid. In four subjects the emptying-time was shortened, while in the other three it was unaltered.

*Effect of Subcutaneous Administration of Strychnine on the Weight and General Condition.*—Ten patients convalescing from various types of illness were employed for this investigation. In all, the weight had been stationary for three weeks before the drug was given. In addition the haemoglobin had been estimated together with the red and white cell counts. The strychnine was given subcutaneously in doses of 2.9 mg. three times daily for periods of 14 to 28 days. All the patients were on full ward diet and were all encouraged to eat as much as they desired. There were no significant changes in either the haemoglobin percentage or the cell content of the blood. Five patients showed an increase in weight of 1 to 5 lb., while in three patients there was a decrease of 1 lb. and in two there was no alteration.

*Effect of a Single Injection of 1/20 gr. of Strychnine on the White Blood Cells.*—Sollmann (1936) states that *in vitro* phagocytosis is hindered by very large doses of strychnine, while Edmunds and Lloyd (1923) find an increase in the white cells in healthy dogs. In two patients who received a subcutaneous injection of 1/20 gr. of strychnine no significant change in the number or distribution of white cells was noted.

#### Summary

From these investigations on strychnine three positive findings emerge: this drug appears, first, to stimulate the fasting stomach to active contractions; secondly, in some cases to hasten the emptying-time after a test meal; and, thirdly, to increase the volume and acidity of the fasting gastric juice. No evidence has been here

adduced to indicate that the parenteral administration of strychnine leads to any improvement in the general condition of the patient.

I should like to express my indebtedness to Prof. Noah Morris for his help, and to the Medical Research Council for a grant towards expenses.

## REFERENCES

- Anderson, W. F. (1933). *Lancet*, 1, 40.  
 Bastedo, W. A. (1936). *J. Amer. med. Ass.*, 106, 85.  
 Bennett, T. I. (1923). *British Medical Journal*, 1, 366.  
 Clark, A. J. (1940).  
 Dickson, W. H., and  
 Edmunds, C. W., and  
 Soltmann, T. (1936).

63, 392.

## Medical Memoranda

### Mechanical-lung Treatment of Pneumonia complicating Acute Poliomyelitis

The following case is reported because of the excellent results obtained by using the mechanical lung in the treatment of pneumonia in a patient who was almost moribund.

## CASE HISTORY

The patient was admitted to hospital on Aug. 22, 1943, as a transfer from another hospital. His history up to that time is described from the notes which accompanied him and from his own observations.

On the morning of Aug. 20 the patient, a warrant officer aged 25, reported sick with a severe headache. By evening his headache was very bad, he had developed pains in the back, and he felt feverish. On admission to hospital he was found to have coarse rhonchi in the left base of the chest and also a few rales; there was no dullness. He was ordered sulphapyridine 2 g., four hours later 2 g., and then 1 g. four-hourly. The next morning he complained of pain in the back, pains down the front of his thighs, and weakness. His eyes were suffused. By evening the signs in his chest had subsided and he was taken off sulphapyridine, having received 8 g. Headache was slight at the time and he had no bodily pains. In the afternoon he had attempted to get out of bed, but found he could not do so, although he could sit up. Next morning he could neither sit up nor move his lower limbs. Knee- and ankle-jerks and superficial abdominal reflexes were absent. He was transferred to this hospital as a case of acute anterior poliomyelitis.

Aug. 22.—Examination showed a young man of anxious expression and very apprehensive, well nourished, and well developed; his face was a little cyanosed. At 2 p.m. his temperature was 101°, pulse 60, and respirations 26; breathing was entirely diaphragmatic. Abnormalities in muscle power and reflexes were: left and right biceps and right serratus magnus flaccid; deltoids moderately strong; pectorals and biceps strong; biceps reflexes brisk; intercostals and abdominal muscles flaccid; superficial abdominal reflexes absent; back and buttock muscles flaccid; thighs flaccid; knee-jerks absent; slight power in left gastrocnemius, right flaccid; ankle-jerks absent; moderate power in left tibialis anticus and peronei; slight power in right anticus and peronei; plantar reflexes flexor. Muscles were not tender, and there were no abnormalities of sensation. Paresis of the bladder was present, and the sphincters were continent. His white cell count was 10,800 per c.mm.—polymorphonuclear, 82%. The cerebrospinal fluid contained increased globulin, 15 cells per c.mm.—polymorphs—and was sterile. The only other finding was diminished breath sounds at the right base, posteriorly.

Aug. 23.—T. at 6 a.m. 101.6°. Catheterized twice; vomited twice.

Aug. 24.—T. 99.4°. P. 70. R. 24 at 10 a.m. Was more cyanosed. Percussion note dull at right base posteriorly and V.P. increased. Breath sounds faint over right posterior lower third of chest; no adventitious sounds. Apex beat not displaced. Partial collapse of right lower lobe—liver's interference with diaphragmatic action considered the probable cause. The head of the bed was raised.

Aug. 25.—T. 102.8°. P. 86. R. 36 at 6 a.m. Further cyanosed. Chest signs unchanged. Radiograph of chest showed opacity of irregular density of right lower third, with some mottling of middle third and increased right hilar shadows. Lobar pneumonia, right lower lobe, diagnosed. Fowler position adopted and 2 g. of sulphathiazole given, to be followed by 1 g. four-hourly.

Aug. 26.—T. 99°. P. 100. R. 36 at 6 a.m. At 6 p.m. his general condition was worse and he looked a bad colour. Bubbling rales could be heard at some distance and he was unable to cough. Some viscid sputum from time to time collected at the back of his throat and was swallowed out of his mouth. When passing through the larynx it caused considerable respiratory distress, and on two occasions he vomited, bringing up sputum. Respirations 46, shallow and jerky. Oxygen given by nasal catheter. At 11 p.m. was mildly delirious and looked gravely ill.

Aug. 27.—At 2 a.m. he was delirious and ashen in colour. There were loud bubbling rales, and a rattle in his throat. P. 140. R. 44. He was placed in the mechanical lung, head end raised on 9-in. blocks. (The respirator had been completed by the Military Engineering Service only three hours earlier, they having done the job in a

day.) At 5 a.m. there was a dramatic improvement. Cyanosis was slight, pulse 92, and orientation normal, though the patient was apprehensive of the lung and wanted to be taken out. Breathing was quiet and no rales could be heard. The lung was working at 25 respirations a minute and at pressures of -4 cm. H<sub>2</sub>O, +4 cm. H<sub>2</sub>O. At 8 a.m. the patient was removed from the lung to be catheterized and made comfortable. R. 36. P. 116 after 10 minutes, and cyanosis returning. Replaced in lung after half an hour, and pulse soon settled to 96 a minute.

From this time on he made good progress and finally left the mechanical lung on Sept. 8. On Oct. 1 his paralysis remained much as on admission, except that the upper-arm muscles were much weaker. His bladder function returned on Sept. 1.

The striking effect of the mechanical lung was the change it produced in the chest—from a "bubbling cauldron" to quiet breathing; for no rales were audible after 8 a.m. on Aug. 27.

In am indebted to Col C. H. N. Baker, Officer Commanding, for permission to publish this case.

Combined Indian Military Hospital,  
India Command

J. L. REYNOLDS, M.B., CH.B.,  
Captain, R.A.M.C.

### Tuberculous Infection of an Extrapleural Pneumothorax complicated by *Cl. welchii* Infection

It may be of interest to record a case of pulmonary tuberculosis in which a tuberculous effusion in an extrapleural pneumothorax was sterilized by the use of "azo-T." Subsequent infection by *Cl. welchii* was successfully treated by azo-T lavage and sulphathiazole instillations.

## CASE HISTORY

A woman aged 35 had been treated for bilateral pulmonary tuberculosis since June, 1939, by extrapleural pneumothorax on the right and intrapleural pneumothorax on the left, the latter being abandoned in Feb., 1942. The right extrapleural pneumothorax was satisfactory until Oct., 1941, when fluid first appeared. In Dec., 1941, the fluid was thin, straw-coloured, and lymphocytic, and contained scanty tubercle bacilli. In Nov., 1942, the character of the fluid had changed; it was then muco-purulent, polymorphic, and there were numerous tubercle bacilli.

Out-patient treatment by aspiration and injection of azochloramide and sodium-tetradecyl sulphate on the lines recommended by Petroff (*Amer. Rev. Tuberc.*, 1941, 44, 738) was instituted on Jan. 19, 1943. Aspirations were at first carried out on alternate days and later twice weekly. The fluid gradually became thinner, and the number of tubercle bacilli decreased until on Feb. 22 no bacilli were present. The fluid remained thin for the next three weeks, but pus cells were persistent. On March 16 the presence of fungal hyphae was noted, and culture of the fluid gave a moderate growth of *Penicillium glaucum*. This persisted in the next two specimens. On March 22 the patient complained of pain in the right side of the chest, and her temperature was 100° F. Her general condition was quite good, but in view of her symptoms she was admitted to hospital. Aspiration was performed on the same day, and next day the bacteriologist reported the presence of *Cl. welchii* in large numbers. *Cl. welchii* serum was administered at once, 40,000 units being given intravenously and 60,000 units intramuscularly. Sulphapyridine was given by mouth, but was replaced by sulphathiazole on March 25, owing to extreme nausea. A further aspiration was performed on March 24, and the bacillus was still present in large numbers.

On March 25, following consultation with Mr. Fatti, treatment by injection of sodium sulphathiazole into the extrapleural cavity was started. The exudate was first removed as completely as possible and lavage of the cavity with azo-T solution performed. Sodium sulphathiazole 8 g., dissolved in 100 c.cm. of normal saline, was then injected. The process was repeated on March 29 and 31. The fluid on both these occasions was negative for *Cl. welchii* and for tubercle bacilli. On March 29 the sulphathiazole content of the clear fluid obtained after autoclaving was 10 mg. per 100 ml., and on March 31, 17 mg. per 100 ml.

The patient's general condition remained surprisingly good and, apart from the extreme nausea caused by the oral chemotherapy, she had no complaints. Her temperature became normal on March 26, and remained so for the rest of her stay in hospital. The white cell count was not affected by the infection or the treatment, the total counts remaining between 7,600 and 8,200 per c.mm., and the differential counts being within normal limits. Fluid gradually reaccumulated in the extrapleural space, and aspiration was again performed on May 4, when the resulting thin, slightly blood-stained, straw-coloured fluid contained only degenerate polymorphs, but no organisms.

The patient was discharged from hospital on May 8, 1943, and has since attended for two further aspirations—in June and July. On both occasions the fluid was thin and sterile.

My acknowledgments are due to Dr. J. N. Deacon, Medical Director, Redhill County Hospital, for permission to publish this paper, and to Dr. A. S. Hall and Mr. L. Fatti for advice on treatment.

MARY G. TATE, M.D.,  
Assistant Medical Officer,  
Redhill County Hospital, Edware.

## Reviews

### RECONDITIONING BY PHYSIOTHERAPY

*Rehabilitation, Re-education and Remedial Exercises.* By Olive F. Guthrie Smith, M.B.E., C.S.M.M.G. With foreword by Lord Horder. (Pp. 412; illustrated. 25s.) London: Baillière, Tindall and Cox, 1943.

The scope of this book is aptly summed up in Lord Horder's foreword. "Reconditioning and rehabilitation," he says, "are in the air; with many folk who pay lip-service to these ideas they remain in the air. In Mrs. Guthrie Smith's book we 'get down to brass tacks,' we follow the special techniques that are appropriate for particular cases, and we realize the extent and the intensity of modern developments in physiotherapy."

For many years the author has preached the gospel of rehabilitation through active exercise, and has earned for herself a deservedly wide reputation for her pioneer work in this field. In her introductory chapter she outlines the basic principles of exercise therapy and deals with the psychological aspects of rehabilitation. In this latter connexion one sentence deserves to be quoted: "The whole art of rehabilitation is to put the responsibility of his own salvation on to the patient, while at the same time making it possible for him to accept this responsibility."

After reviewing the physical and physiological principles underlying exercise therapy, the author proceeds to a detailed account of the various types of exercise appropriate to the re-education and redevelopment of injured or diseased muscles. One of the most important principles in any exercise system is that of progression. In the earliest stages of extreme weakness, such as in poliomyelitis, the muscles require positive assistance—the exercise must, in fact, be "weightless." At the other end of the scale the muscles of labouring men must be hardened by making them work against resistances approximating to the stresses of their work. The physiotherapist must be able to pass from one end of this scale to the other by almost imperceptible stages, and the main part of this book is concerned with a detailed account of how this is done. The author is a pioneer in the development of "weightless" or "suspension" exercises for the early cases, and this is the first account in book form of her original work.

In dealing with resistance technique the various uses of pulley-and-weight apparatus and of springs are discussed, though it is perhaps not sufficiently stressed that these resistance methods have their dangers as well as their advantages. In certain conditions—e.g., in knee-joint injuries—it is of crucial importance to use the correct amount of resistance at all stages, and we hope that in a future edition the author will have something to say on these important matters of dosage and timing in relation to resistance technique. Supplementary chapters, dealing with recovery after fractures, rehabilitation of chest and maternity cases, recreational therapy, electrotherapy, joint manipulation, and plastic operations, are contributed by experts in these particular fields.

This book is well written, well illustrated, and original and stimulating in its outlook. It deserves to be read not only by the physiotherapists to whom it is primarily addressed, but by every surgeon and physician who would wish his direction of the physiotherapist to be intelligent and progressive.

### CONSPECTUS OF PROGRESS IN MEDICINE

*The 1943 Year Book of General Medicine.* Edited by George F. Dick, M.D., J. Burns Amberson, jun., M.D., George R. Minot, M.D., William B. Castle, M.D., William D. Stroud, M.D., and George B. Eusterman, M.D. (Pp. 754. \$3.00.) Chicago: The Year Book Publishers.

The *Year Book of General Medicine* can be relied upon to give a comprehensive view of its swiftly changing panorama. The current volume is no exception to the rule. It is not surprising that a good deal of attention is paid to problems connected with blood transfusion—hence the discussion of the Rh factor, the dosage of either albumin or plasma after a severe injury or burn, and the causes of severe haemolytic reactions. Epidemiology is represented by a thoughtful paper on influenza by C. H. Andrewes, another on malaria as a world menace, and another on epidemic catarrhal jaundice as typically

a military disease which shows regional variations. It is surprising to learn that 2,500 cases occurred during the short battle of Crete. Deficiency in a particular ingredient of the vitamin B complex, which has been labelled "N," is believed by R. M. Calder to aggravate damage to the liver cells. Ankylosing spondylitis is described as a complication of brucellosis. Kidney diseases come in for consideration, particularly in relation to hypertension, and it is interesting to note that, after several swings of the pendulum, lipoid nephrosis is no longer regarded as a separate entity, but merely as a stage in nephritis through which some cases pass. The derided doubters can now recover their self-esteem.

Wartime conditions add to the clinical importance of acute pulmonary oedema. Luisada argues that the physician should have at hand morphine, atropine, sodium phenobarbital, and papaverine hydrochloride. The first three are best when toxic gases, drowning, or skull injuries are the cause of the attack, while in cardiovascular conditions the first two and the last one are to be preferred. Newer concepts in the diagnosis of congenital heart diseases based on clinical and angiocardiac x-ray studies are fully discussed. We would suggest, however, that a classification based on the embryology (and therefore on the evolution) of the mammalian heart would make more intelligible what many otherwise find a mere collection of bizarre distortions. Industrial medicine has received a recruit in the awkwardly named condition of bagassosis. Bagasse is the broken sugar-cane after the sugar has been extracted and is used in the preparation of board. Although this contains 5.7% silica the symptoms differ in several respects from any known form of silicosis, as shown by Castleden and Hamilton-Paterson in our columns (*B.M.J.*, 1942, 2, 478). These are but a few of the many interesting subjects discussed in the *Year Book* for 1943.

### DR. PARKES WEBER'S WRITINGS

*F. Parkes Weber's Collected Writings.* In Celebration of his 80th Birthday and 50th Anniversary as Visiting Physician to the German Hospital, London. May 8, 1943. Edited by the Medical Staff.

The combination of enthusiasm for clinical research and a profound knowledge of medical literature has given Dr. Parkes Weber a unique position in the profession. It was a happy thought, therefore, for his colleagues at the German Hospital to celebrate the 50th anniversary of his election to their staff and his 80th birthday by planning a *Festschrift*. Wartime restrictions have prevented this from taking the form of printing even a selection of his more than a thousand papers. The reported speeches delivered on that occasion were characterized by sincere admiration rather than by eloquence, and, apart from the bibliography, the principal value of this book is the excellent synopsis of his principal contributions compiled by Dr. K. Blum. Dr. Parkes Weber has collected rare diseases as some have collected rare butterflies, but to imagine that it is merely rarity value which appeals to him would be to misinterpret the whole purport of his work. He has used rarities to help towards the explanation of problems of general interest, as the late Sir Archibald Garrod did in his *Inborn Errors of Metabolism*; though he has cast his net more widely. Thus there are pioneer observations on polycythaemia, erythrocytosis, telangiectases, panniculitis, the "pink disease," and the condition now known as Cushing's syndrome. In some instances he has approached generalizations which cannot yet be fully formulated in the present state of our knowledge. This applies particularly to his work on endocrine tumours and abiotrophies. When the time is ripe for such a synthesis it will be found that much of the material has been provided by Parkes Weber. Nor has medicine exhausted his interests, which include numismatics and archaeology.

It is a striking record of what may be accomplished by a man whose ability is accompanied by perennially youthful joy in research and an insatiable thirst for knowledge. We believe that this must have provided him with a happy life for he radiates generous helpfulness to others. He has received many honours, including the Moxon Gold Medal from the Royal College of Physicians, and, having become the Nestor of medicine, is secure in the affectionate admiration of his colleagues.

## INJURIES OF SKULL, BRAIN, AND CORD

*Injuries of the Skull, Brain and Spinal Cord.* Neuro-Psychiatric, Surgical and Medico-Legal Aspects. Edited by Samuel Brock. Second edition. (Pp. 616; illustrated. \$7.00 or 35s. 6d.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1943.

Though many of the chapters in this second edition have been modified slightly in the process of revision there are only two outstanding additions—references to the use of sulphonamide drugs in the treatment of wounds and of meningitis, and an instructive account of electro-encephalography after head injury. As only three and a half years have elapsed since the first edition appeared, the small amount of alteration of the work as a whole is scarcely to be wondered at, more especially as the authors are experts, who would therefore have contributed material which was fully up to date in the original edition. It remains a book which will prove most useful to neurologists, surgeons, and psychiatrists who take a special interest in cerebral trauma, for they not only will find much that is of value in the text, but will also be greatly assisted by the numerous but carefully chosen references to the literature. It is not intended as a textbook for undergraduate students, nor will it be fully appreciated save by those who frequently encounter the problems with which it deals.

The chapter on the electro-encephalographic changes which occur in cerebral injury is a helpful guide to anyone who wishes to gain an impression of the methods employed and of the pitfalls that must be avoided in the interpretation of the tracings. A great deal is being learnt about cerebral injury during the war, both in the advanced and in the base areas, and we look forward to seeing these aspects of the subject dealt with as additional matter in the next edition.

## Notes on Books

Fifty years ago the late Prof. EMMETT HOLT first published his *Care and Feeding of Children*. Since 1924 its revision has been in the hands of his son, and now a sixteenth edition has been issued (D. Appleton-Century Company \$2.00). It is intended for the intelligent mother and is largely in the form of question and answer. The book remains, in its latest enlarged revision, a most reliable manual of instruction in the difficult art of successful mothercraft.

The Tuberculosis Association of India has published from 20, Talkatora Road, New Delhi (price 12 annas) a *Directory of Tuberculosis Institutions in British India and Indian States* for 1943. This is designed to give ready and reliable information about the facilities for the treatment of persons suffering from tuberculosis in dispensaries, sanatoria, and other institutions. The first part occupies 70 pages and the second part 20 pages, followed by an index of places listed in British India and in Indian States.

A Supplement to the 22nd edition of Vol. I of the *Extra Pharmacopoeia* (Martindale) has been published for the Council of the Pharmaceutical Society of Great Britain by the Pharmaceutical Press, 17, Bloomsbury Square, W.C.1, price 2s. (plus 2d. postage). It is a pamphlet of 48 pages, recording many changes that have been made, chiefly on account of war conditions, in the *British Pharmacopoeia* and the *British Pharmaceutical Codex*. For the convenience of prescribers and suppliers tables are included taking note of the principal changes made by the publication of a *National War Formulary* and of changes made in the *United States Pharmacopoeia* and the new *U.S. National Formulary*. The pamphlet ends with a summary of recent Statutory Orders affecting supplies of drugs, etc., some newer proprietary names, and corrigenda for Vol. I of the *Extra Pharmacopoeia*.

The second edition of *Revelation of Childbirth*, by Dr. GRANTLY DICK READ (Heinemann; 21s.), is certain to be widely read both by doctors interested in obstetrics and by members of the general public. The theme is babes without fears, and the author presents a strong case to show that fear is the root of much evil in obstetrics. This is by no means a new concept, but nevertheless Dr. Read deserves full credit for the publicity he has given it by word and deed. One wonders whether the cause he sponsors—and what nobler one could be imagined than the allaying of the fears and the pains of childbirth?—is aided as much as it could be by this edition. Constant repetition wearies even the most sympathetic reader and is apt to irritate the critical one. A much-condensed volume would present the case more clearly and forcibly. If such a volume were written it would with benefit omit most of the frequent references to the opposition of the "orthodox profession" to Dr. Read's ideas. These references may make entertaining read-

ing to a "Citadel-minded" public, which will also doubtless enjoy the jibes at obstetrical specialists and anaesthetists, but they achieve no positive results. Medical readers will wonder where all this opposition has been found, and may perhaps be forgiven for wondering if Dr. Read has not been unduly suspicious of even his friends.

E. and S. Livingstone of Edinburgh have published a fourth edition, revised and enlarged, of *Diseases of the Eye*, which forms one of the Catechism Series (price 1s. 6d., plus 3d. postage). The strength of this booklet is its concise orthodoxy. The new edition shows evidence of reluctant departure from orthodoxy on several points. Revision of the text for a further edition might with advantage be entrusted to an impenitent iconoclast.

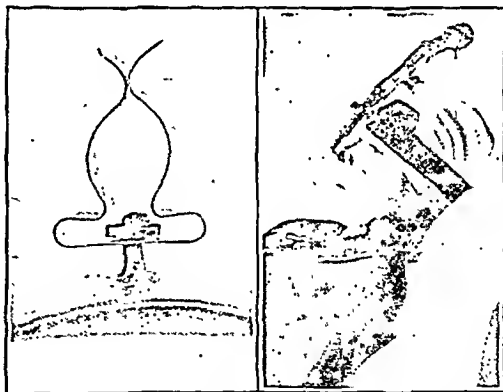
## Preparations and Appliances

### A HEAD HARNESS FOR ENDOTRACHEAL ANAESTHESIA

Dr. A. OWEN-FLOOD (London, N.8) writes:

Most anaesthetists have experienced the annoying episode of the endotracheal tube slipping out of place when applied through either the nasal or oral route. It occurs mostly when the patient is placed in the Trendelenburg position during an abdominal operation. There is an avalanche of pillows, tube, and connecting gear, falling with a loud clatter to the floor. The patient promptly "comes out" and starts to strain his intestines through the incision. The surgeon gives the anaesthetist a glance aptly described in Ireland as "a look like a summons," and the latter's frantic efforts to find and replace another sterilized tube produces an atmosphere described in diplomatic parlance as "tense."

The little device here illustrated avoids all this. Its construction is simple and the cost of materials negligible. Nearly every practitioner has in his possession a laryngologist's reflecting mirror clamped to a forehead plate by a small metal post



surmounted by a knob. Detach the mirror and clamp and file off this knob, leaving as much of the post as possible. Obtain from any hardware stores a good high-grade tempered steel clip (Ferry's is a suitable type) of sufficient size to retain the connecting-tube holder on the Boyle's apparatus or other source of anaesthetic. The clip is placed on to the post of the forehead plate. It is not necessary to use a rimer as the hole in its base fits snugly on the post. Place a small washer over the latter and fix this firmly to it with a blob of solder. Take care that the solder does not fall on the clip. This must not be fixed to the washer, but should be allowed to rotate freely in its horizontal axis around the post.

When in use the plate is attached to the patient's head by its original strap, and the connecting joint to the anaesthetic apparatus is fitted in the clip. This is in turn connected with the tracheal tube protruding from the nose or mouth by any type of connector which ensures a clear airway.

Supplies of "tabloid" brand "iodicin" (capsules), gr. 3, in tins of 50 and bottles of 250, are again available. Wartime conditions have necessitated a change in the shape of the capsules, but the therapeutic activity is unaltered. "Iodicin" is an organic iodine preparation for oral administration in place of the inorganic iodides. Descriptive literature can be had from Burroughs Wellcome and Co., 12, Red Lion Square, W.C.1.



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## THE HEALTH OF NEW YORK

The health department of New York City realizes that the health records of any year lose much of their interest if they are not published promptly. On each New Year's Day, therefore, Dr. Ernest L. Stebbins, the health commissioner, presents to the Mayor and issues to the Press a summary report for the year that ended the night before. War apparently is no obstacle. The report for 1943 is quite a substantial document running to thirteen closely typed foolscap pages, and comparing the more important of the year's statistics with those which have gone before. There appears to be no valid reason why our own public health units should not be able to do the same.

The population of New York is 7,625,000. It is therefore the most populous urban unit for which comprehensive health data are available, and big enough to give its annual figures meaning without the cruder statistical fallacies. For many years the improvement in the mortality from most causes and in the incidence of some diseases has been great and continuous. For instance, the infant mortality rate has fallen from 120 per 1,000 live births in 1900-9 to 30.2 in 1943; and the neonatal rate from 36.2 in 1910-19 to 21.5, a decline of 40% even in this most refractory part of the child mortality. Rates such as these are not exceptional in the U.S.A., or indeed in some British Dominions and foreign countries; but no large city in the United Kingdom can approach them. Both rates were, however, a little higher than in 1942, mainly because of diarrhoea, pneumonia, and accidents. The maternal mortality rate, also, which remained long at a high level in New York, has dropped from 6.0 per 1,000 live births in 1931 to 2.1, and is now lower than the 1942 rate for London. As elsewhere, the greatest decline has occurred since the introduction of sulphonamides in the middle thirties, and it is therefore probably most evident in the septic causes.

There is little interruption in the well-known campaign to *extinguish diphtheria* in New York. In this huge population 281 cases were notified in 1943—the lowest number on record—compared with an annual average of 14,282 in 1910-19 among a much smaller population. Six large districts of New York have recorded no deaths for periods varying from 5 to 8 years. The health commissioner expresses concern that the deaths in the whole city rose from 7 in 1942 to 16 in 1943. In 1942 London County, with fewer than 4 million people, had 1,813 cases and 51 deaths. This is a measure of the leeway we have to make up in immunization. But perhaps even more striking is the falling mortality from measles and whooping-cough, diseases which have not materially changed in their periodical incidence and which have been uninfluenced by any systematic application of specific prophylaxis. The mortality from measles per 100,000 children under 5 years

of age has fallen from 27 in 1930-3 to 2.5 in 1940-3; whooping-cough from 29 to 10.3. As elsewhere, measles, though more common—or perhaps more commonly recognized—is now by far the less fatal of these two diseases.

New York, however, has not entirely escaped the health hazards of war. Meningococcal meningitis had been at a low ebb, with 48 cases and 17 deaths in 1940, when it was ravaging this country. Since then it has increased continuously, and more rapidly during the last two years, when 411 cases with 84 deaths and 1,412 cases with 233 deaths were respectively recorded. The case-mortality rate was 16.5% in 1943 compared with 50% only a few years ago—another instance of the beneficent effect of sulphonamides. The decline of tuberculosis also has been interrupted. The rate for 1942 had been a low record at 46.2 per 100,000 from all forms of the disease; in 1943 it was 47.9, both the respiratory and other forms contributing to the rise. Apparently the exceptional increase in meningeal tuberculosis which was a feature of the British statistics of 1940 has not been observed in New York. The health commissioner attributes the retrogression to the fact that people with previously healed lesions have succumbed to the overwork of wartime. In comparing the New York tuberculosis rates with those of British towns an increment of about 15% should be allowed for residents dying elsewhere without transfer of the death record. Since 1941 venereal diseases have become more prevalent. In the first eleven months of 1943, 23,594 cases of syphilis of all types were recorded. The number of early infectious cases reported in the first ten months of the year was 3,433, representing an excess of 39% over the figure for the corresponding period of 1941; and the 15-24 age group was especially affected. The anti-venereal-disease campaign has been intensified. The health commissioner also expresses concern about an increase in deaths from pneumonia, the rate per 100,000 having risen from 39 in 1942 to 50.5 in 1943. There was an excess in almost every month in comparison with the previous year. He regards it as disturbing in view of the availability of specific means of treatment. The really great increases in certified causes of death, however, are revealed, as in most civilized countries, among the chronic diseases of later life. The rate of diabetes has risen from 25.7 in 1930 to 42.7 in 1943; for cancer (unstandardized) from 117 to 172.7; and from that heterogeneous group which includes diseases of the heart, arteries, and kidneys, and apoplexy, from 381.5 to 533.1. That these increases are due mainly to more accurate certification or classification and to changes of medical fashion, and only to a slight extent to change in the real causes of death, may be concluded from the fact that the crude general death rate has remained virtually stationary throughout these years (10.9 per 1,000 in 1943), although the population affected has been growing older and therefore more likely to swell these categories in the lists of death.

The prompt issue of New York's health statistics each year will make it possible to follow closely the course of events in wartime and perhaps to learn new lessons. Will diphtheria remain at a low level if drafts of medical men and nurses to the fighting Forces make it impossible to keep up the level of immunity of the children? Will tuberculosis increase from wartime strain and, even in America,

from some degree of food shortage? Or will fuller employment and higher wages counteract these latter influences? Will influenza, which touched New York in December as it did here, return with renewed force this year or next and smudge the whole statistical picture? At least we shall not be kept long waiting to know about it. In the meantime it must be recognized that much of the success achieved in New York is due to the vigour and persistence with which both the health department and voluntary organizations have applied themselves to the education of the people in health matters. We need not wait to learn this lesson.

## A TOXIC FACTOR IN TRAUMA

Traumatic shock is the name given to a clinical syndrome fairly common in centres of industry even in times of peace. In war, however, it provides problems which are urgent everywhere. At the end of the last world conflict it was commonly believed that the shock which appeared some time after the injury was the result of some toxic absorption from the damaged tissues, and all that was left unsolved was the isolation of the toxin. Since then this view has lost much of its appeal, and attention has been paid to adrenal exhaustion, loss of fluid, and reduction in the activity of the sympathetic nervous system. Evidence exists which favours every one of these as an important factor in the pathogenesis of shock, and much of the modern treatment of shocked patients derives from the conception that the maintenance of an efficient circulatory volume is all-important. While the need for transfusion is granted, there are records of too many cases in which the loss of fluid, even when calculated generously, is insufficient to explain the clinical phenomena. Recent work by H. N. Green<sup>1</sup> suggests a return to the hypothesis of toxæmia. Using rats with experimentally produced hind-limb ischaemia, he found that survival of the animal depended on amputation of the injured limb as soon as possible after the removal of the clamping apparatus. This fits in admirably with the point emphasized by Grant and Reeve<sup>2</sup> that in cases of traumatic shock surgical treatment must be carried out as soon as possible after the circulation has been adequately restored. Green further demonstrated that restoration of fluid volume in the rats had by itself little effect in diminishing the mortality rate. Another fact of importance which was elicited was that the animal could survive a very long asphyxia provided that it was induced for short periods separated by intervals. As Green points out, this suggests that some toxic factor produced at the site of injury is in some manner got rid of, provided too large a dose is not suddenly thrown into the circulation.

A comprehensive account is given by Bielschowsky and Green<sup>3</sup> of the methods adopted in isolating and determining the nature of this "myotoxin," and it is concluded that it is adenosine phosphate. Of more immediate importance to the clinician is the effect of this toxic factor on the animal. Injection by any of the parenteral routes causes a rapid fall of blood pressure, progressive weakness, and

rapid shallow breathing, followed by slow irregular respirations which precede death. Haemoconcentration is an important feature which is almost certainly associated with the great amount of fluid in the damaged tissues and elsewhere, the marked congestion of liver and great veins, and the haemorrhages into lungs and digestive tract. It is interesting to note that with intraperitoneal administration the lethal dose of the toxic factor is smaller than for other routes—a fact which may be connected with the very large volume of intraperitoneal exudate that is produced. The effect on the kidneys is especially worthy of note. Anuria was always observed even when large amounts of fluid were injected simultaneously, suggesting that the toxic factor had some direct action on the renal cells; and the hypothesis seems worth considering that the permeability of the tubular epithelium is greatly increased, allowing the complete reabsorption of the glomerular filtrate. This view is favoured by the author's impression of pathological changes in the lining cells of both the first and second convolutions. In this context the observation that injection of myohaemoglobin enhances the effect of the toxic factor brings to mind the clinical conditions in which haemoglobinuria is said to play a part in the pathogenesis of anuria. Green displays a natural caution in drawing analogies with the syndrome of shock as seen in man, but it appears justifiable to conclude that the state brought about by the toxic factor is worthy of the designation of shock and that it presents features which are very similar indeed to those presented by the crush syndrome. In any event a new field has been opened to pathologist and pharmacologist, while the clinician's heart is uplifted in the hope that more light is to be thrown on the age-old problem of shock and more help given for its prevention and treatment.

## THE HEALTH OF BELFAST

The report for 1942 of the medical officer of health, Dr. C. S. Thomson, though curtailed, gives a comprehensive review of the health of the city of Belfast. The general death rate was only 11.2 per 1,000; during the preceding 20 years the mortality had ranged from 12.9 to 15.6. The birth rate, 21.7 per 1,000, was the largest for eight years. The infant mortality during 1942 was high—92 per 1,000 births. There has been only a very slight improvement in the infant death rate during the past two decades, and this has been masked to some extent by wide annual fluctuations. The range during this period has varied from 78 in 1930 to the appalling figure of 122 in 1940. As a result of such a high infant mortality there were, in 1942, more deaths recorded in the first year of life than in the forty years from age 5 to 45. The causes of infant mortality are not given in the report, but it is evident that an important factor is diarrhoea and enteritis; during the preceding 20 years the highest and lowest mortality from this cause corresponded with the highest and lowest infant mortality. Deaths from diarrhoea and enteritis under 2 years of age numbered 166 in 1942. In contrast to the high infant mortality the rates for maternal mortality and stillbirths were relatively low, being 3.2 and 38 per 1,000 respectively. Mortality from tuberculosis in 1942 fell to the pre-war level following the rise in 1940–1 which interrupted the almost continuous decline of the interwar period. The deaths for 1939–42 were 365, 412, 426, 369 for pulmonary tuberculosis, and 71, 94, 98, 79 for other forms. During the

<sup>1</sup> *Lancet*, 1943, 2, 147.

<sup>2</sup> *British Medical Journal*, 1941, 2, 293, 329, 332.

<sup>3</sup> *Lancet*, 1943, 2, 153.

29 years 1914-42 mortality from respiratory tuberculosis has been more than halved, while mortality from non-pulmonary forms has been reduced by three-quarters. The results of the campaigns against diphtheria and venereal disease are reviewed in the report. For diphtheria the immunization scheme continues to make steady progress, and over 44,590 children have received a course of treatment. The number of children under 15 immunized was 9,506 in 1942 and was 2,150 fewer than in the preceding year. The proportion of the child population under 15 immunized is only about one-third, and less than one-quarter of the pre-school children have had treatment. In 1942 369 cases of diphtheria with 15 deaths were reported, compared with an average for the preceding ten years of 828 and 40. The results obtained under Regulation 33B from its commencement in the spring of 1943 to the end of July, 1943, are stated to be most disappointing, and no headway whatever has been made in the control of venereal disease, which has increased very much lately. Dr. Thomson considers 33B a failure and advocates compulsory notification, and he suggests the immediate adoption of the New York regulations which became law in January, 1918.

### PULMONARY ABSCESS

Few parts of the body provide so many pitfalls for the uninitiated surgeon as the thorax, and the treatment of a lung abscess can be one of the most difficult problems in thoracic surgery. A recent exposition by Brock<sup>1,2</sup> of the surgical approach to abscesses in the upper lobes is therefore particularly welcome, and stands out from the vast and diffuse literature of this subject because of the characteristic thoroughness and clarity of its presentation. Brock first describes the anatomy of the bronchi of the upper lobes, showing that the successful drainage of a lung abscess can rarely be achieved without a knowledge of this subject. Comparison of other recent accounts of bronchial anatomy (Foster-Carter<sup>3,4</sup>) with this one shows that there is now substantial agreement about the distribution of the upper-lobe bronchi, including those of the axillary regions, the sole exception being the shape of the broncho-pulmonary segments forming the "lingula" of the left upper lobe. Here Brock considers that the division between the two segments is horizontal rather than vertical. He then emphasizes the importance of accurate location of a lung abscess and describes in detail how this can be achieved. Very careful location is essential in order that drainage may be performed with a minimum of damage to the patient at the site of election—where the abscess is nearest to the chest wall. For instance, the commonest site for a right upper-lobe abscess is the sub-apical (posterolateral) segment; it is of the utmost importance for the surgeon to determine whether the abscess is situated in the posterior or the lateral subdivision of this segment, because the surgical approach is completely different in the two cases. Failure to recognize these facts results in what Brock calls the "blunderbuss" method of attacking a lung abscess, with multiple rib resections and extensive damage to the chest wall and healthy lung tissue. An adequate knowledge of the complex bronchial supply of the so-called "axillary" areas is also indispensable when locating and draining abscesses of these regions.

In another investigation Brock<sup>5</sup> has confirmed the pioneer work of Koch and Wieck<sup>6</sup> who showed that the posterior end of the main interlobar fissure on both sides

is at a lower level than is commonly supposed. The apex of the lower lobe is rarely higher than the posterior end of the fifth or sixth rib, and consequently an abscess of this area will require drainage by resection of a rib below this level, commonly the eighth rib. Textbook descriptions, on the other hand, would lead one to expect such an abscess to lie above the sixth rib, because the level of the lower-lobe apex is given incorrectly as the third dorsal transverse process.

The experiments of Quinn and Meyer<sup>7</sup> in 1929 showed that lipiodol introduced into the nose during sleep flowed readily into the lungs, and this has been held to support the theory that lung abscesses are due to the inhalation of infected material. Brock, Hodgkiss, and Jones<sup>8</sup> describe with much more precision the exact areas reached by small quantities of iodized oil introduced into the trachea with the subject in various positions. It is significant that, when the patient lies on his back, the oil flows into the subapical (posterolateral) segment of the right upper lobe and into the apical (dorsal) segments of the lower lobes. When the subject lies on his side the oil gravitates, as would be expected, into some part of the "axillary" region of the dependent upper lobe. These areas are the commonest sites for the occurrence of a lung abscess, and the authors conclude that most pulmonary abscesses are caused by the inhalation of infected material during sleep or anaesthesia. They state also that the lesions of pulmonary tuberculosis commonly affect the same areas, and suggest that these too are the result of bronchial embolism. Without underestimating the value of these experiments, it is still important to preserve an open mind on this subject, remembering that other theories, also supported by experimental evidence, have been advanced. The distribution of the pulmonary artery is very like that of the bronchi, but it has not yet been studied so extensively. The experiments of Cutler<sup>9</sup> on the production of lung abscess and of Chien-Liang Hsu<sup>10</sup> on the formation of tuberculous lesions, to mention only two examples, suggest that infected vascular emboli may also be a factor in the pathogenesis of pulmonary infections. It is therefore unjustifiable to adopt a dogmatic attitude towards this problem at the present time, but in many cases of lung abscess the evidence appears to favour an aspiration origin.

### EXTENSION AT ROEHAMPTON

An extension of the limb-fitting centre at Queen Mary's (Roehampton) Hospital was opened recently by Dr. Wellington Koo, the Chinese Ambassador in London. The extension includes a spacious demonstration theatre, with annexes, and is equipped with cinematograph apparatus, for lectures and classes on the science of limb-fitting. This follows upon a resolve of the governors, largely at the instigation of one of them, Kathleen, Viscountess Falmouth, to bring the facilities at Roehampton to the attention of the representatives of the various Allied Governments now in this country. In this way we may hope that the knowledge and experience gained at Roehampton will become widely available in European countries after the war. A number of new workshops have also been built with a view to dealing with the many limbless cases which are the result not only of war but of injuries in industry and transport. In a graceful little speech in the new demonstration theatre Dr. Wellington Koo said that Roehampton furnished a fascinating story of successful endeavour in practically a new field of service to humanity. He handed the key of the extension

<sup>1</sup> *Guy's Hosp. Rep.*, 1942, 91, 111.

<sup>2</sup> *Ibid.*, 1943, 92, 26.

<sup>3</sup> *Brit. J. Tuberc.*, 1942, 36, 19.

<sup>4</sup> *Proc. roy. Soc. Med.*, 1943, 36, 451.

<sup>5</sup> *Guy's Hosp. Rep.*, 1942, 91, 140.

<sup>6</sup> *Anatomische Analyse des Röntgenbildschattens des Herzens und der Interlobaralven des Lungen*. Jena, 1930.

<sup>7</sup> *Arch. Otolaryngol.*, 1929, 10, 152.

<sup>8</sup> *Guy's Hosp. Rep.*, 1942, 91, 131.

<sup>9</sup> *Amer. J. Dis. Child.*, 1929, 38, 683.

<sup>10</sup> *Amer. Rev. Tuberc.*, 1938, 38, 162.

(made in duralumin, the same metal as that in which the artificial limbs are constructed) to Sir Walter Womersley, Minister of Pensions, who said that numbers of medical men from the Allied nations had already attended at Roehampton, and in the factories some Polish nationals were actually being trained in limb construction with a view to starting a factory under Government auspices at Warsaw on their return. He added that in the extension post-graduate courses would be provided for medical men from this country as well as from abroad, and training would be given to medical auxiliaries and to women who wished to learn the technique of nursing amputation cases. It was hoped also that Roehampton would be the scene of surgical conventions. A film of the work was shown, and a demonstration was given by patients so adept that one realized with difficulty that they were wearing an artificial limb at all.

### SMALLPOX: A WARNING

On Feb. 6 a military patient from the Middle East was admitted to the Mount Vernon Emergency Hospital, near Rickmansworth. He had been vaccinated successfully in infancy and again two years ago. After a few days he had what was regarded by competent medical officers as measles and chicken-pox, and the true nature of the condition was not found out until an unvaccinated nurse who had been in attendance on him, and an unvaccinated visitor to the ward in which he was, developed confluent haemorrhagic smallpox. Both these patients died. Subsequently, four vaccinated nurses developed modified smallpox and had much the same manifestations as the primary case; all are mild cases of the disease. A 52-year-old patient, vaccinated as an infant, died from a severe attack. He was in a ward next to that in which the primary case occurred, the staff being common to the two. All the cases were confined to a small division of the hospital, and, so far as is practicable, all recent contacts have been traced and vaccination or re-vaccination offered. It has, however, not been possible to trace a large number of visitors to the hospital, and practitioners are asked to bear this in mind when called in to see doubtful cases. The strain of virus is intensely virulent, but is obviously so susceptible to vaccination as to obscure the classical picture and make diagnosis difficult. The possibility of diffusion cannot be disregarded, and practitioners and medical officers of health are reminded of the assistance in diagnosis which is available from the medical staff of the Ministry of Health, both regional and central, and from the London County Council.

### THERAPEUTIC ABORTION IN SWITZERLAND

English gynaecologists are familiar with the problem of how far therapeutic abortion is permitted by law. Mr. Aleck Bourne's case<sup>1</sup> brought a little light in Mr. Justice Macnaghten's instruction to the jury, where his lordship stated that pregnancy may lawfully be terminated to save the mother's life, and that "life" includes not only survival but also a reasonable prospect of health. Medical speakers have from time to time demanded that Parliament should give some protection to the qualified medical man who terminates pregnancy in good faith for the protection of his patient's health. The Swiss legislature actually passed a law of this kind in 1941,<sup>2</sup> but it does not seem to have entirely simplified the position; in fact, Dr. Alfred Labhardt has explained<sup>3</sup> at some length the new medico-legal problems which it raises. It provides that a qualified medical practitioner may lawfully intervene if a number of conditions are satisfied. The doctor must be in actual practice, and the patient must consent in writing

(the husband's consent is not required). The reason for the operation must be medical: the immunity does not extend to social, legal, or eugenic grounds. Intervention is justifiable only if the disorder for which it is undertaken directly menaces life or involves great danger of severe and lasting injury to health, and if the danger cannot be averted in any other way. The necessity must be confirmed by a second medical practitioner, who must be a specialist in the disease for which the operation is considered. Dr. Labhardt observes that this is the first time the standing of a specialist has been recognized in a Swiss statute, and says the profession had to fight hard to get it inserted. The specialist is named by a specially appointed authority of the canton—in Basle the chief medical officer—from a panel submitted by the representative professional body.

In towns where several specialists are available the patient's doctor may choose his second opinion; if one specialist does not agree with him he may call in another, but he must disclose the opinion of the first. Differences of opinion may be resolved in consultation with the head of the specialty. The State has no further part in the operation, and professional secrecy is fully maintained. The second opinion must be given in writing after an exhaustive study of the history and personal examination, and must go fully into the prognosis, the need for the operation, and the possibility of using other methods. The specialist must certify in the exact words of the statute the existence of a danger to life that cannot otherwise be averted, or of a great danger of severe and lasting injury to health. The specialist, the patient's doctor, and the operator should, Dr. Labhardt recommends, each keep a copy for at least five years, together with a copy of the patient's form of consent. The second opinion may be dispensed with in an emergency—e.g., in rural practice or on the operating table—but the circumstances must be reported within 24 hours to the health department of the canton. A doctor who intervenes for reasons, however weighty, that are not strictly therapeutic is not exempt from punishment, but the court may take them into account in deciding the penalty. (In England, where no minimum penalty is laid down except for murder, the court could do this without a statutory provision.) Dr. Labhardt thinks, nevertheless, that non-medical grounds should be dealt with in the specialist's written opinion. He also feels strongly that a doctor called in to terminate pregnancy after a formal opinion has been given in favour of intervention should thoroughly investigate the case himself and not rely blindly on the opinion. It is therefore desirable that the chief surgeon of the clinic or department where the operation would be performed should take part in the consultation at which the intervention is discussed, so that he will not have to refuse at the last moment.

Most Swiss gynaecologists probably agree with Dr. Labhardt that the new law substantially improves their position. It enacts in precise statutory form very much the same principles as Mr. Justice Macnaghten enunciated in the Bourne case. The policy in this country, on the contrary, has been deliberately to avoid precision and to trust the integrity of the medical profession to observe loyally a largely unwritten law. The Bourne case so far satisfied the advocates of precision that they have not since made a concerted demand for legislation. Our professional honour is perhaps better served by Mr. Justice Macnaghten's sympathetic statement on what we may do than it would be by a cold statutory formulation of what we may not.

The Council of the B.M.A. at its meeting on March 3 appointed Dr. Charles Hill to the vacant post of Secretary of the Association.

<sup>1</sup> *British Medical Journal*, 1938, 2, 199.

<sup>2</sup> Swiss Penal Code, Arts. 120-1, Jan. 1, 1942.

<sup>3</sup> *Schweiz. med. Wschr.*, 1943, 73, 20.

## MR. CHURCHILL WITH THE PHYSICIANS

The Prime Minister was the principal guest at a luncheon party given on March 2 by the Royal College of Physicians of London. There were two speeches, one by the President (Lord Moran), who proposed the health of the guests, and Mr. Churchill, who in his reply gave the toast of "The College."

## Science, Action, and Character

Lord MORAN, in the course of his speech, said:

"I was under the impression that my wanderings were a new chapter in the long history of the College, but the annals are full of the travels of my predecessors—to the Court of France, to the Low Countries, and to Spain. . . . It is perhaps inevitable, having spent so many hours in the ante-chamber of Councils of War, that I have come to compare the profession of medicine and the profession of arms. Progress in both professions has always come by jumps punctuated by long periods of stagnation. . . . In comparing the professions one asks whether the same qualities are needed in both. For some years now I have come much into contact with soldiers, and as a doctor I see no reason to believe that the scientific mind is more common in my calling than in the Army. At any rate, that is true if I am speaking of practising physicians and surgeons. I hasten to add that qualification, for there are half a dozen creative minds in the profession of medicine who have no counterpart in the Army—Sherrington, Adrian, Dale, Gowland Hopkins, Thomas Lewis, Almoth Wright, all Fellows of our College. There is, too, no machinery in that Service like the Medical Research Council for the discovery of men with a creative instinct at the outset of their careers. Such men would carry out research into tactics and weapons—for example, the limitations of the anti-tank rifle would have been laid down before it was used in battle. But I am not sure if the conditions of the two professions are strictly comparable. I doubt whether the direction of armies in war calls for the creative instinct in the same measure as does research into the origin of disease. . . . There is one other qualification I must make. I am bound to ask if the conditions of the soldier's life and training are friendly to the development of the scientific mind. Discipline does not foster independence of thought, while life in a regimental mess hardly encourages those habits of reflection that are only bred in solitude. Further, there is the fetish, not confined to soldiers, that the mind works best when the body is exhausted by exercise.

"There is one quality which both callings need. The first and the last essential of an efficient soldier is character; without it he will not long endure the perils of modern war. Even in the last war the durability of a general—his survival value—seemed to depend more on character than on capacity. We may doubt the pre-eminence of Foch, Haig, Jellicoe, and Trenchard in their art, but as men they came from the old mould of their race. They wore well, they were built for great occasions. In the fundamental clash between great nations when their existence is at stake the issue is determined by moral and not by intellectual factors. The part that character plays in medical diagnosis is not always appreciated. It is the quality which allows judgment to be exercised irrespective of worldly considerations which may snare the feet of the lighter breed of doctor. I end my comparison with a paradox. The successful doctor sees a stranger almost every hour of the day, and he must not only find out what is wrong with him but must learn to gauge his temperament and his outlook, what he wants to know and whether he is going to do what you tell him, and so the physician, after 30 or 40 years, becomes an expert judge of men, but he cannot use it in devolving his work. He must exercise his lonely art as an individual. Now the soldier who has not the art of selecting his subordinates is lost, but it is the paradox of the situation that, unlike the physician, he gets few opportunities in peacetime of practising this art. Even individual criticism is discouraged in the mess."

Lord Moran ended with a glowing tribute to Mr. Churchill, measuring his contribution to victory by attempting to define more precisely than had been done the exact nature of his task. That task as he saw it was the moral preparation of the youth of England for ordeal by battle. The art of command was the

art of impressing the imagination. When the surge and thunder of the Prime Minister's vast vocabulary were heard no more history would recount how he spread abroad a sense of purpose and direction which gave men hope when there was really none. "More than once I have been with him when news of shattering reverses was brought to him, and in my heart I have come to think of him as invincible."

## The Government's Health Policy

The PRIME MINISTER, who was received with loud cheers, began by thanking his cherished friend, Lord Moran, for all the kind expressions he had used about him. After speaking of some remarkable and inspiring recent advances in medicine, he said that the discoveries of healing science must be the inheritance of all. Disease must be attacked, whether it occurred in the poorest or the richest man or woman, simply on the ground that it was the enemy. The Government had adopted the policy outlined in the words of Lord Beaconsfield on health and the laws of health, and that was the course upon which it had embarked.

"Our policy," said Mr. Churchill, "is to create a national health service in order to ensure that everybody in the country, irrespective of means, age, sex, or occupation, shall have equal opportunities to benefit from the best and most up-to-date medical and allied services available. The plan that we have put forward is a very large-scale plan, and in ordinary times of peace would rivet and dominate the attention of the whole country; but even during this war it deserves the close study and thought of all who can spare themselves from other duties for that purpose. We welcome constructive criticism; we claim the loyal and active aid of the whole medical profession. Any health services must rest on two arches: the first, the general practitioner, the rank and file of the profession; the second, the hospital service, depending upon the staffs of the hospitals, sustained and guided by the consultants."

"The fact that many more consultants will be needed in the future than there are now must not result in dilution or in the lowering of the standard of consultant work. There is a new gap to be filled, and in this new effort the Colleges must play their great part. We ask your aid: we invite your counsel. Tackling together these vast problems we may take a forward movement which will be notable and permanent in its effects long after the roar of cannonade has died away. We have to-day announced the names of the Royal Commission on Population. There is no branch of human knowledge in which we can pierce the mysteries of the future so clearly as in the trend of population. Here you have prophecies which rest on certainty; here the searchlight of statistics ranges with accuracy for 30 or 40 years ahead. The destiny of our country, which after all has rendered notable services to mankind in peace and latterly in war, depends upon an ever-flowing fountain of healthy children, born into what we trust will be a broader society and a less distracted world. Science, now so largely perverted to destruction, must raise its glittering shield not only over the children but over the mothers, not only over the family but over the home. In all this field again you must be active. Your services will be given with devotion and your voice will be heard with respect."

"This College must play its part in keeping alive the historic tradition of the medical profession, and must ever foster those high standards of professional behaviour which distinguish a profession from a trade. This is what you have tried to do as an institution for 400 years. I confess myself to be a great admirer of tradition. The longer you can look back the further you can look forward. The wider the span, the longer the continuity, the greater is the sense of duty in individual men and women, each contributing their brief life's work to the preservation and progress of the land in which they live, of the society of which they are members, and the world of which they are the servants."

Infant mortality in Belgium per 1,000 live births was 81.3 in 1939, 93.2 in 1940, 92.3 in 1941, and 96 in 1942 (*Arch. méd. belges*, 1943, 96, 1). The nutritional condition of children under one year in 1941 and the first half of 1942 was still satisfactory. Diseases are not commoner than formerly except for slight traces of rickets, which occur even in breast-fed children. Altogether 62% of children are breast-fed. Usually, after the third month, only 25% are still breast-fed.



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## Reports of Societies

### THE R.A.F. MEDICAL SERVICES AND THEIR CONTRIBUTION TO THE WAR EFFORT

At a meeting of the Medical Society of London on Feb. 14 Air Marshal Sir HAROLD WHITTINGHAM, Director-General of Medical Services, R.A.F., lectured on the contribution which that service had made to the war, as regards selection of personnel, prevention of disease, treatment of sick and injured, rehabilitation, transport of casualties by air, and the maintenance and improvement of physical and operational efficiency.

#### Selection Tests

He dealt first with the selection tests for pilots and others. A new hearing test, using a pure-tone audiometer with a noise background simulating the noise experienced in aircraft, had been devised with a view to replacing or reinforcing the 20-ft. whisper test. As for visual tests, some maintained that as the pilot flew by instruments at night no night visual standards were necessary. On the other hand, the pilot might be compelled to land on a strange airfield after a long flight over the Continent, or to land even on a familiar airfield when intruder aircraft were about, and he might experience crowding over the target. The possibility of taxiing accidents was doubled at night. Therefore tests and standards for night vision seemed to be necessary. There were also clinical tests for cardiovascular stability in selecting pilots suitable for aerobatics. Those who had a low blood pressure and showed no rise in the diastolic blood pressure in change from the horizontal to the vertical on the tilt table were usually rejected. The Navy was the first Service to adopt mass radiography, but the R.A.F. was the first to use mobile units for this purpose. Since 1941 over 400,000 such examinations had been carried out. Among those examined 2.8 per 1,000 males and 3.6 per 1,000 females were found to have active tuberculosis.

#### Maintenance of Efficiency and Disease Prevention

Sir Harold Whittingham next spoke of the maintenance of flying efficiency. One innovation was the flying personnel medical officer. A number of medical officers had their wings and flew with the men, or piloted aircraft themselves, making observations and linking up with the research team. Some of these officers were sent abroad to the different fronts to study special flying problems from the point of view of human efficiency.

Turning to prevention of disease, he showed a chart illustrating the striking improvement in the health of the R.A.F. The Force was now at the healthiest point in its history in either peace or war. In this respect a 25% improvement was shown in 1941 over 1940, and again in 1942 over 1941, but in 1943 the improvement was only 10%, simply because the position was now so good that the scope for improvement was restricted. A team studied dietetics and assessment of food values. The general instruction was that diet must not be modified in such a way as to increase transport or financial outlay, though now and again some vitamin deficiency was revealed and it was necessary to send special foodstuffs. At Malta during the siege some men suffered from night blindness, which persisted in spite of extra doses of vitamins A and C, but within a week of a surfeit of oranges becoming available night vision went back to normal, suggesting that some factor essential for good night vision is present in oranges. Dental hygienists were now for the first time introduced into the R.A.F.—a quite considerable body of them—and were doing first-class work in scaling and polishing teeth as well as instructing air men and women how to care for their teeth. The breakdown rate from nervous conditions had proved extremely small.

#### Evacuation of Casualties by Air

With regard to the evacuation of casualties by air Sir Harold Whittingham said that the R.A.F. had transported about 28,000 sick and wounded during hostilities in the Mediterranean war zone, including a number from North Africa to the United Kingdom. As was to be expected, Army cases greatly preponderated.

#### Hospital Provision

Hospital provision included specialist centres such as those for plastic surgery, the treatment of burns (specially equipped with brine baths), and orthopaedics. The R.A.F. mobile field hospital usually consisted of 100 beds, expandable to 200 by means of stretchers. The hospital packed up entirely into 28 vehicles, and in the Western zone one was supplied for each 10,000 personnel. In tropical and subtropical zones the provision was one to every 5,000 personnel. He described the flying surgical section—which was in Sicily on the second day of the invasion—and the special scheme for the collection of casualties and sea rescue. To discover the best method of effecting sea rescue of disabled and unconscious men, one medical officer had himself anaesthetized and thrown repeatedly into a swimming bath. The result was an improvement in the design of the "Mae West jacket," but it cost the medical officer four days in hospital afterwards on account of the exposure.

#### Rehabilitation

A first-class system of rehabilitation in the Royal Air Force was started during the Battle of Britain in 1940 and had since been extended and was in practice on every front. A large number of rehabilitation orderlies were employed to see that the necessary exercises, beginning in the hospital, were carried out. Cases were sent from hospital to rehabilitation centres so designed as to remove any hospital atmosphere for psychological reasons. Each patient was required to be taught to walk properly from the beginning, otherwise he acquired a limp; he was taught to walk up and down steps; and finally to jump 10 feet into a sand pit to simulate landing after a parachute jump. Among fracture cases 82% were got back to full flying duty; among burns, about 80%; and among nervous cases, 46%, although approximately 80% of the last group got back to flying duty of some sort.

#### Oxygen Supply

Air Marshal Whittingham said that the R.A.F. physiologists, in the early days of the war, designed an oxygen installation that was more than twice as efficient as the then existing set. This played an important part in helping pilots to gain mastery of the Luftwaffe in the Battle of Britain. Thus at 20,000 ft., if a flier was not getting oxygen, he became unconscious, if walking about, within 5 minutes, and at 25,000 ft., if sitting still, he became unconscious in 7 minutes. Without oxygen at 30,000 ft. he became unconscious in 2½ minutes and died in 15 minutes, and at 40,000 ft. became unconscious in half a minute and died within 5 or 10 minutes. Even at 10,000 ft., if oxygen were not taken, some effect was noticeable. Lack of oxygen produced symptoms resembling those of drunkenness; the man "felt himself to be at the top of the world, while every minute he was slipping under the table." The lecturer recalled that once on a flight from Iceland he wrote a paper during the voyage, and thought he had written it extremely well, only to find afterwards that it was ridiculous nonsense. The flight was at just over 12,000 ft. At 15,000 ft. there were visual disturbances and at 18,000 ft. hearing started to suffer; one suddenly realized that one was not hearing the engine. It had been necessary to indoctrinate air crews as regards their need for oxygen. He described and illustrated the oxygen apparatus and also the experimental chambers in which altitude pressures up to 70,000 ft. could be simulated.

#### Other Precautions

Finally Sir Harold Whittingham described the measures taken to deal with what was known as "bends"—a condition in which nitrogen bubbles formed in the blood and tissues, and various symptoms such as disabling pains in the joints, spots in front of the eyes, and a choking feeling were experienced. Only 10% of fit air crews under the age of 28 suffered from bends. The trouble was overcome largely by careful selection of personnel for special duties. Frost-bite had practically ceased to exist in the Air Force. Out of over 12,000 man-sorties there was only one case of frost-bite, and that was usually due to the negligence on the part of the individual. Improvements in the heating of aircraft had decreased the incidence of frost-bite tenfold in 4 years. Blacking-out occurred, not on account of speed but of changes in speed. Its avoidance was partly ensured by posture, so as to lessen the pooling of blood in the most

dependent parts, and by ensuring a high degree of physical fitness, including abstinence from alcohol and tobacco. Researches in connexion with altitude flying, explosive decompression, baling out from stratosphere heights, "blacking-out," cold, and night vision, including the counteracting of search-light glare, had materially helped our aviators both in the Battle of Britain and that of Berlin. He ended with a high tribute to the medical officers, professional, scientific, and executive, who had built up a medical service which he felt was second to none.

Lord MORAN, P.R.C.P., in proposing a vote of thanks to Sir Harold Whittingham, said that the greatest contribution the medical services had made to the R.A.F. was in the elimination of fear, since it was fear which paralysed the will power and lowered the morale.

### ENURESIS

A meeting of the Section of Urology of the Royal Society of Medicine was held on Feb. 24, with Mr. E. W. RICHES in the chair, to discuss enuresis.

Mr. T. TWISTINGTON HIGGINS said that enuresis was a symptom, not a disease. It was defined by Meredith Campbell as "the involuntary and usually unconscious voiding of large amounts of urine which occurs predominantly during sleep in the absence of organic disease of the nervous or urological system." The word "unconscious" seemed to exclude children who were deliberately dirty in their habits; these could not be excluded. The definition made no mention of age, but enuresis should not be spoken of until the child was 3½ or 4 years old. The ordinary healthy infant properly trained might be expected to be dry at 18 months, and if between that age and 3 the child was perpetually flooding, something was likely to be wrong. Spina bifida occulta must be considered. If the spines of all children were examined by x rays a proportion—estimated by some authorities to be 35%—would be found to have fusion defects, and, particularly if these were in the sacral area, spina bifida occulta might be the cause of enuresis. Approximately one case in ten would be found to have some organic disease of the urinary tract. The urinary tract lesions to be expected were almost all due to obstruction in the tract or infection, or a combination of the two. Careful examination should also be made of the external genitals. In girls vulvovaginitis was the commonest lesion. In boys the state of the external urinary meatus should be noted to ascertain whether it was contracted, ulcerated, or misplaced. One of the many traditions about the prepuce was that it must be amputated to stop bed-wetting, but he had never seen a prepuce, however tight, concerning which he was satisfied that it was a cause of urinary obstruction. Circumcision had no place in the treatment of enuresis. The condition of the bladder and the question of residual urine should be taken into account; a complete urine analysis should also be made. If this preliminary examination indicated a urological basis for the enuresis the child should come under treatment by the urologist, but if nothing abnormal was revealed the enuresis might be assumed to be functional. For functional enuresis institutional treatment of the proper type was invaluable, but not all children with bed-wetting could or should be treated in an institution. Sociological implications could not be ignored. The remedy was in better and securer homes and more intelligent, wiser, and less harassed parents.

Mr. H. P. WINSBURY WHITE said that during wartime a great increase in this condition was to be found in males, especially adolescent and adult males. He mentioned the value, after excluding extra-urinary conditions, of dilating the contracted urethra. As dilations would often have to be repeated it was wise to make this perfectly clear at the outset. The minimum period between dilations should be one month. Prolongation of the individual treatment by the use of the indwelling catheter for half an hour, and its removal before the patient awakened from the anaesthetic, could be carried out in certain cases. Chronic frequency of micturition when present usually improved quickly from dilatation.

### A Classification of Cases

Dr. W. SHELDON, as a practising paediatrician, said that enuresis was by no means confined to the poorer sections of the community: it was found in all social grades. In young children it was equally divided between the sexes; in the second half of childhood it was more common in boys than girls. Among 5,000 children aged between 5 and 10, and living in L.C.C. institutions, the incidence of enuresis was 5%. The classification he had found useful was: (1) cases associated with organic disease of urinary tract; (2) cases associated with disorder of health in some other system of the body; (3) cases associated with mental retardation; (4) functional enuresis persisting from infancy or reappearing in later years. In the first group there was usually diurnal as well as nocturnal enuresis or very great frequency of micturition. He had yet to see a boy whose enuresis could justly be attributed to phimosis. In the second group

many conditions might act as contributory factors, including disorders of the alimentary tract. Adenoid enlargement causing snoring and disturbance of sleep should be considered. He would reserve ephedrine for the treatment of enuretics whose condition was associated with allergic rhinitis. The use of drugs in the third group was universally disappointing. Something might be done with children in this group by bribery in return for a dry bed. In the fourth group it was useful to withhold fluid after tea and forgo any meal at bedtime; also to see that the child made a real effort to empty the bladder before going to bed, and was roused again after four hours to pass water. The attitude of the home must be encouraging. Praise for a dry night was better than scolding for a wet one. The raising of the bed so that the hips were above the level of the shoulders was sometimes useful. There was another group consisting of sensitive and intelligent children, who stood particularly in need of sympathy and encouragement; and, lastly, there was a small group of enuretics whom the war had brought into notice—those who intentionally wetted the bed to gain some advantage, such as transference to a fresh billet.

Dr. E. B. STRAUSS considered that enuresis belonged to psychiatry more than to urology. There was an atavistic pull-back to the original watery environment of the race. Another important factor was the extreme sensitiveness of the kidneys and bladder to emotional stimuli. He doubted whether spina bifida occulta was found more often among enuretics than among those who had developed normal bladder control. When pills and potions effected a cure they worked through their suggestive rather than their pharmacological properties. He had treated a group of children with a belladonna and potassium citrate mixture and a control group with burnt sugar only, and had got the same proportion of cures in both. Secondary enuresis might respond well to hypnotic suggestion. Mr. E. W. RICHES said that the finding of spinal fusion defects in a child with enuresis was not to be taken as an assumption that the defect was the cause of the enuresis. It was an indication for further investigation, which should be carried out with the cystogram and the cystomicrogram. By these means, with cystoscopy of course, it was possible to discover which bladders showed signs of disturbance of nerve function. If these cases were left he was sure that they would go in progressive stages to the complete incontinence of senility.

Wing Cmdr. J. C. AINSWORTH DAVIES found that indigestion was an important exciting cause. He had seen enuresis associated with gastric and duodenal ulcer, and when the ulcer improved the enuresis cleared up. One way to distinguish the malingering from the true incontinent was, on applying the urethroscope and fixing the floor of the internal meatus, to watch the roof, which ordinarily could not be seen unless the urethroscope was pulled right down to an angle of more than 45 degrees. If, however, the roof simply flapped into view he thought the case was likely to be one of true incontinence—that is to say, a relaxed internal sphincter. He also raised the question of the possibility of plastic operations. Mr. F. McG. LOUGHNANE said that he had had no experience of operating for enuresis. In examining these children with the cystoscope he had never found an abnormality in the bladder or neck of the bladder. If the children were of the age of about 12 he used the cystoscope without giving any local anaesthetic, and in a large number of these cases, whether as the result of suggestion or not, they did get better quickly. One of the most disappointing patients was a boy who at the age of about 14 was at a public school, where the matron was always holding him up as a bad boy on account of this habit. He had no abnormality. The speaker saw the boy when he was about 18 and sent him to a psychiatrist, who said that he had a fear complex which would take a very long time to resolve. He believed psychiatry to be indicated more than surgery in the treatment of these cases.

The Council of the Association of Clinical Pathologists prepared a draft memorandum in September, 1943, on a National Service in Clinical Pathology, and this was approved by a general meeting held on Jan. 28, 1944. The memorandum begins by stating that it seems likely that the national medical service of the future will be organized upon a regional basis, permitting a considerable degree of local autonomy within a framework set up by central authority. "Pathology is an integral and indissociable part of medicine, and as such must participate in any general reconstruction of the whole." Discussing pathology in relation to practical medicine, it says that public health or environmental pathology must continue to be the concern of Governmental bodies. Clinical pathology is the affair of those engaged in the diagnosis and treatment of sickness in the individual, and this latter branch of pathology, being the field of the Association of Clinical Pathologists, is the main subject of the memorandum. The views of the Association are then put forward under eight heads: scope of a national service, organization, attendance of patients at laboratories, domiciliary service, special clinics, status of clinical pathologists, blood transfusion service, and post-mortem service. The hon. secretary is Dr. W. H. McMenemey, Pathological Department, Royal Infirmary, Worcester.

## Correspondence

### Haemolytic Disease of the Newborn

SIR.—I have read with great interest the annotation in your issue of Feb. 19 on the eugenic and genetic aspects of the Rh factor, but I wonder whether the concluding statement that this genetic research has led "to the chance of timely recognition of a great danger and thus to prompt and successful treatment" is not too optimistic, since, although prompt treatment by injection of Rh-negative blood has improved the immediate prognosis, there is as yet no evidence that it will prevent the development of those dread sequelae of haemolytic disease of the newborn—kernicterus, cirrhosis of the liver, and (possibly) polyostic fibrous dysplasia.

It has been suggested that the danger of kernicterus is diminished if transfusion is carried out early, but in infants suffering from icterus gravis and hydrops foetalis we do not know for how long before birth the haemolytic process has been going on. Recently my colleague Dr. Baar has, as Haldane suggested, estimated the anti-Rh agglutinins in a pregnant Rh-negative woman—one of whose previous children had died from icterus gravis—and found that a marked increase in the titre of the agglutinins occurred at the seventh month. This observation suggests that destruction of the foetal blood began two months before the termination of the pregnancy. The occurrence of hydrops foetalis and the importance of haemolytic disease in the production of stillbirths are evidence that the disease may have such a long intra-uterine course that treatment will not be universally successful; moreover, since cirrhosis of the liver has been found in stillbirths which show evidence of haemolytic disease it is clear that cirrhosis may be present when the child is born alive. Possibly kernicterus might be prevented if labour were induced or Caesarean section done at the time when the great increase in the titre of anti-Rh agglutinins in the mother's blood occurs; but in the case already mentioned this would have meant the added risk to life of such a degree of prematurity that the child might be almost classed as non-viable. Actually this mother was allowed to go to term and an exsanguination transfusion with Rh-negative blood carried out on the infant within a few hours of birth.

It may be thought that kernicterus is so rare that its occurrence may be discounted; but it is only necessary to see one case to realize that, until this complication can be prevented, the ultimate prognosis of icterus gravis can never be regarded light-heartedly however successful its immediate treatment may be. In the past, when attention was only paid to ABO grouping in transfusion, its incidence has been about 8 to 10%. There are certain symptoms—excessive somnolence, convulsions, and a high-pitched cry—which suggest the occurrence of kernicterus, and if these are present I believe it is better to leave the child untreated in the hope that it will not survive.—I am, etc.,

Birmingham.

LEONARD G. PARSONS.

### Control of Pharmacological Products

SIR.—The plea made by Mr. Robert Taylor (Feb. 26, p. 307) for a control of pharmacological products deserves a wider publicity and the support of our representative medical councils. He exposes the technique by which manufacturing chemists select a product possessing a specific therapeutic action, modify the formula in a small way, and exhibit the newer design under a fancy name. Taylor sees signs of this exploitation, so obvious in the case of barbiturates, being applied to the sulphonamides. How much longer is the medical profession to tolerate and condone this travesty of scientific therapeutics? When a certain digitaline pill gained a reputation in the treatment of heart failure, eight other manufacturing chemists prepared a digitaline product. A controlled clinical trial of these separate brands having the same distinctive colour and the same peculiar dosage showed a wide and unsafe variation in their therapeutic effects. Another miscarriage of our scientific

aims in treatment is instanced by the many remedies recommended for angina pectoris and high blood pressure. The merits of such potions are exalted in the daily press, on the backs of motor-buses, and even on the interleaves of medical journals. The Therapeutic Trials Committee of the Medical Research Council undertakes to test remedies submitted voluntarily by any drug house, but there is a need for a medical research tribunal which would control all proprietary preparations and release none for therapeutic purposes until a beneficial action has been established after clinical trial.

In the evaluation of a remedy three postulates should be accepted as forming a statutory standard of efficiency. First, the drug must retard the progress of a disease and/or relieve its symptoms. Secondly, it must show this specific action consistently and in the majority of patients, and in this way demonstrate an effect distinct from and superior to that which might take place as a natural periodic variation in the course of the disease in the absence of treatment or during placebo therapy. Thirdly, it must produce its beneficial effects without toxic symptoms. Not until the Ministry of Health invests such powers in a medical research tribunal will the haphazard selection of medicines for our patients give way to therapeutics founded soundly on scientific assay.—I am, etc.,

London, W 1.

WILLIAM EVANS.

### Functions of Industrial Medical Service

SIR.—In answer to Dr. D. Kenwyn Harris's excellent letter (Feb. 26, p. 304), we are sorry that we did not make the question he raises clear beyond doubt in our article.

We work in the most intimate manner with local practitioners, the public health department, and the local hospitals. As soon as any patient presents herself to the medical department of the factory she is referred either to her own doctor or, if she so desires, to the works clinic. The patient's wishes are the only consideration. If she chooses the works clinic she is first examined and then referred to her own doctor with a covering letter giving full details of findings and suggesting a line of treatment. With the approval of the doctor, who is usually relieved that we will undertake the routine work on his behalf, the patient is then supervised by the clinic, treated if necessary, and booked for hospital, evacuation centre, etc., according to her choice.

Exactly similar methods are employed for gynaecological cases. We emphasize that only treatment of industrial conditions and emergencies is carried out without the approval of (1) the patient, (2) the patient's doctor, (3) the hospital or clinic, or (4) the public health authority, as the case may be. Perhaps we have been fortunate, but the relations existing between all the above and ourselves are of the most cordial nature. The last sentence of Dr. Harris's letter expresses the feelings we had in the matter until recently, but our investigations have convinced us of the need for assisting gynaecological cases, especially where the demand for labour for vital purposes made it essential to keep "all hands on deck."—We are, etc.,

J. V. O'SULLIVAN.  
L. B. BOURNE.

London, N.5.

### Physics in Medicine

SIR.—I am sorry if Dr. Mumford finds that my letter on emulsions is a criticism of dermatologists or of those who dare to sign prescriptions. The intention was to draw attention to certain facts which might, perhaps, give a better explanation of what happens in practice. Adsorption phenomena are of such general daily application that we are apt to overlook the science in it. Little is really known of the manner in which medicaments get into tissues, unless we are satisfied with phrases which are quite correct but are only general statements. Indeed, the recent paper by Lionell and Thomson (Nov. 6, 1943, p. 572) shows that there is doubt whether some of the drugs commonly used have any effect at all. We know that thallium salts will cause every hair to drop out (provided that the patient survives), but there is no real knowledge of how or why it does so. Quinine has been used for some centuries, and we rely on it to a great extent for controlling the worst disease known to mankind.



Much work has been done on it and the literature is very great, yet we are still completely ignorant of how or why it acts, and there is even considerable doubt exactly where it exerts its influence. Opium has come down to us from the ancients, and we still do not know how or why morphine affects some cells more than others, why there is that special selection: only the general statement that it affects metabolism of those particular cells.

As to the "physical rules governing such contact" modern textbooks deal with that subject and many individual papers are concerned with it. The best-known and commonest example is the function of the red blood cells, where it is recognized that physical properties play an important part. It is known that Donnan's equilibrium theory holds, but the details are obscure. Much the same is true of botanical physiology. Again, speaking generally, the blood may carry the same materials to adjacent tissue cells, yet each cell may select different substances from it. But this general statement is not true if one goes into details, for the "blood" does not usually supply tissue cells *directly*—never in the skin—only in certain cases. More usually most cells of the body rely on serum extravasated and make their selection from that serum. All cutaneous cells do so, but we do not know how or why the cells make such selection. The most probable explanation is a physical one. We do know that the extravasation is due to physical conditions—*pH*, etc.—but I have heard no explanation of how or why it acts.

The truth is that most of us (and I am one) are so ignorant of mathematics that we tend to take refuge in denying and decrying the whole thing. It is the easiest way out. I am one of the antiquated group who are trying to creep out of that pit of stagnation; and it is just that effort which makes me realize how much I miss and to what extent medicine, even the practice of it, fails or lacks simply because we funk the *dx/dy* business, de Moivre's theorem, and so on. And the interesting thing is that there does not seem to be any actual necessity to know about *dx/dy*, the square root of minus one, the squiggles used, so long as medicine accepts the deductions made by the physicists. To me the real interest in Dr. Mumford's letter is that it indicates how strong is the repugnance to getting out of a groove, even among dermatologists. If only it were realized what a great field is open in this direction, and also how useful it might be in practice, we should soon get more knowledge on the "physical rules governing contact." There is no necessity for any physical chemist "to arise," for there are many at work, though there are too few of them, but very few practitioners who dare to consider them, far less to attempt to apply them in practice.—I am, etc.,

Kingston Hill, Surrey

W. F. COOPER.

### Tonsillectomy in Children

SIR.—Mr. E. Carew-Shaw writes that there is a "small minority" in the medical profession who hold the view that tonsil and adenoid removal in children is at the best useless and even may be harmful." I have never heard of anyone who has stated that this operation is "at best useless," and should be obliged if he would let me have the reference to the articles which "have appeared in various medical journals" which make this opinion "obvious" to him. "Significant" I agree. There are those who hold that this operation "even may be harmful," but I doubt whether those who hold this view are in a "minority," and I am confident, if they are, that it is not "small." Just the opposite. The significance lies in the growing body of men and women who believe that it is time strictly to limit this operation to "criteria" that will produce the excellent results that with him I find it gives, though that these are "well known" I doubt, or the operative activities of the many would be limited to the few in which it occurs.

I am one of those who taught Mr. Carew-Shaw's generation the aphorism about "the tonsils, all the tonsils, and nothing but the tonsils," but I now believe that the physiological movements of the palate and fauces are less impaired when a little bit is left behind at the lower pole. I am not prepared to go back upon my teaching, because I cannot say in which patient

it will continue to do harm and necessitate a second operation more difficult and more damaging than the first. I prefer to limit the damage that I do by a careful selection of cases in the first instance; and for this nothing is of greater value than the long waiting list. Though the operation is never an urgent one it is probable that if after waiting for six months no harm has come to the child the advice given in the first instance was wrong. There is no need for laryngologists to "struggle with nearly overwhelming lists of children for tonsillectomy." They should use their lists and review monthly all those patients that have been on them for six months. They will thus save themselves much unnecessary work, the parents much anxiety, and the children much pain and harm. I do not believe that any surgeon can guarantee that he will do no harm by any tonsillectomy that he performs, however perfectly and by whatever method. The movements of the fauces and palate are so delicate and so numerous that any fibrosis will interfere with them, and whenever scarring is observable the damage is definite. The effect of this upon the physiology of the upper respiratory tract is far-reaching, though difficult to determine and not previously sufficiently recognized.

Mr. Carew-Shaw makes a grave accusation against himself when he suggests that he gives more care and attention to his patient when he is paid by a specific fee than when he is paid by a salary, sessional payment, or capitation grant. This is a matter that those who deal with the N.H.I. have been struggling with since its existence. It is to be regretted that some doctors do, and thereby bring disrepute upon those who are striving to give the same service to all. I do not believe that any mother should ever be expected or allowed to hand over her child for this operation with its attendant dangers after less than a quarter of an hour's discussion with the surgeon. I further believe that if he gives that amount of time to each case he will so cut down the number in which he advises operation that he will have more time rather than less upon his hands. It is a remarkable thing that when an operation has been advised the administration will always find the time, accommodation, and personnel for its performance, but that no such administration has as yet been set up which will give that minimum of a quarter of an hour between the parent upon whom the responsibility for decision rests and the surgeon in whose hands the responsibility for advising the operation is finally put.—I am, etc.,

Guy's Hospital, S.E.1.

T. B. LAYTON.

### Infant Mortality in Scotland

SIR.—In contrast to the Orr Committee, which has studied the problem of Scottish infant mortality from its academic, professional, and administrative eminence, may I, having studied and experienced it from below, venture on this constructive criticism of the committee's report.

The Orr report shows that the high infant mortality in Scotland is due to the low standard of living of a large part of the population, yet its main recommendations do not counteract the adverse factor of poverty itself. The experience of poverty is not confined to bad housing and poor diet, although these are important evils. There are other contributory deprivations, such as inadequacy of clothing, footwear, bedding, furniture, and cooking utensils, all of which combine to induce frustration and mental apathy.

I. *Rehousing*.—We have had rehousing schemes for almost twenty years; although they have dealt only with a small part of the population in slums, it may be assumed that the experience of these is representative of that of rehousing on a national scale. Rehousing abolishes overcrowding and reduces infection, but these benefits are lessened (a) when economic necessity restricts a family in the use of its house either by fuel consumption or by the subletting of rooms; (b) when a family has to use a common towel. In a review of the effects of rehousing over a five-years period in Stockton-on-Tees (McGonigle and Kirby, 1936) it was found that in the rehoused population the infant death rates were not significantly less than those in the slum areas, because the rehoused families had continued to live under the handicap of poverty. The Orr report states that in Glasgow good results have been obtained by rehousing. It is obvious, however, that so long

as the environment of poverty persists the best results cannot be achieved. Can a city with the highest infant death rate of the English-speaking world be content with less than the best?

2. *Diet*.—In Part III of the report (the Feeding of Mothers and Infants) it is stated that the inadequate diets of pregnant and nursing mothers among the poor are associated or correlated with the toxæmias of pregnancy, with premature birth, stillbirth, and unsuccessful lactation; yet the recommendations of the report are most vague with regard to diet. One would have expected the committee to endorse its belief in such a grave and sweeping statement by a more vigorous recommendation, such as the immediate provision of adequate meals for necessitous expectant and nursing mothers (so far as food resources permit). Sir John Orr, in his book *Food, Health, and Income*, has shown that, dividing the population into groups according to income, the higher the group the better the diet it instinctively purchases: surely this is an argument in favour of raising the economic level of the poor.

3. *Child Welfare Services*.—The report recommends their extension and improvement, and the further improvement and training of health visitors and medical staff. The health visitor of to-day is a capable (but dispirited) woman who is a State-registered nurse; many are, in addition, certified midwives, and others may have undergone special training in health visiting. At the present crude stage of the problem the qualifications of the health visitor are largely wasted, as her work consists chiefly of imparting the most elementary principles of hygiene and infant care. In this she fails—as indeed does the whole medical personnel of the child welfare service—not because of ignorance of the niceties of nutrition but because her knowledge is a useless weapon against the armour-plating of poverty.

The report also states that "clinic premises are often poor, ill equipped, and overcrowded." This is very true, but so long as poverty persists, any expenditure on the construction and equipment of specially designed clinics is wasted money. I have personal experience of conducting a clinic under the most advantageous conditions in a building designed for that express purpose. It was of no more value than the most faulty premises in a slum because of the poverty of the rehoused population for which it catered.

The Secretary of State for Scotland recently announced in Parliament that the infant mortality for 1943 had fallen to 65 per 1,000 live births, the lowest yet recorded for Scotland. He attributed this to a reduction in unemployment figures from 11.5% in 1939 to 1% in January, 1944, and to the resulting increased purchasing power. Thus we see that prosperity has struck a big blow at Scottish infant mortality. It is the common experience of child welfare workers that prosperity can transform an apathetic parent into an alert and responsive one. Encouraging as these figures are, there must still be many families which have not participated in this economic well-being.

From the Orr report we learn: (a) that the high birth rate of the Scottish poor is at a level desirable for the population as a whole; (b) that a high birth rate is not necessarily correlated with a high infant death rate, as in Scotland; (c) that Holland and New Zealand with high birth rates (and a higher standard of living) avoid this wastage of infant life. Is there not therefore a clear indication for recommending the speedy provision of adequate family allowances (first sponsored by the Beveridge report), which would give prosperity to that part of the population most sorely in need of it?

In conclusion, the Orr Committee has discovered the main truths concerning the high infant death rate in Scotland, but its recommendations have not kept pace with its findings.—I am, etc.,

Dyce, Aberdeen.

MARGARET S. M. MCGREGOR.

### Extrinsic Renal Factor

SIR.—With reference to an article in the *Journal* of Sept. 18, 1943 (p. 356), on pituitary hypothyroidism with impaired renal function, by Drs. Beaumont and Robertson, the association of these two factors is noted as "not previously referred to in the literature." While this statement is true so far as these observers are concerned, it may eventually be of some his-

torical interest to point out that the actual discovery of the "extrinsic renal factor" was made by a group of research workers at Auckland, N.Z. The preliminary articles appeared in the *New Zealand Medical Journal* in April and June of 1941. Subsequent articles (5M and 5T) were rejected by both the *New Zealand Medical Journal* (June 6, 1941) and the *British Medical Journal* (March 23, 1942) on the grounds of lack of space and the paper shortage. The Medical Research Council of Great Britain acknowledged their receipt on June 7, 1942.

In these and subsequent articles (5A, 5P, 5H, and 5R), which are all included in our book entitled *The Electrical Factor in Metabolism*, by Abbott and Fowler, the association of this peculiar type of renal insufficiency of function with an endocrine dyscrasia is demonstrated by means of the Fowweather urea clearance technique. A description, with many illustrative cases, is also given of the new method of augmenting renal function by means of water that has been physically altered as the result of its exposure to the radiation and the electrostatic field supplied by the "scalebuoy effect."

We have suggested that a similar physical alteration in the water molecule is brought about by the metabolism of the life process with its endocrine control. The articles also deal with this new radio-electric technique in relation to a variety of clinical phenomena, such as the sedimentation rate of blood, pigmentary structures, the urea mechanism and excretion, the immunity mechanism, nephrosis, menstrual dysfunctions of the endocrinopathic type, and the hydrophilization of colloid structures in relation to a variety of phenomena such as asthma, glaucoma, fibrositis and nodule formation, diabetes mellitus, prostatic hypertrophy, acne vulgaris, and symptomatic effects of the  $\alpha$ -bacterial rheumatic type.

Only a limited number of the above-mentioned book are being printed for circulation among similar research groups in Australia, Canada, Great Britain, and the U.S.A. with the object of co-ordinating the work. It is also felt that much further confirmation of the various concepts, such as that provided by Beaumont and Robertson in the case of the extrinsic renal factor, is necessary before the work could be added to the general literature on metabolism. The authors would, however, be prepared to supply a copy of the book gratis to similar interested research groups.—I am, etc.,

Epsom, Auckland, New Zealand

W. N. ABBOTT.

### Sulphaguanidine and Renal Damage

SIR.—I have read with great interest Dr. H. G. Smith's article on sulphaguanidine for Flexner dysentery (Feb. 26, p. 287). He states that the high incidence of toxic rashes suggests the need for care in dosage, but my experience is that it is more important to guard against kidney damage, even when using sulphaguanidine in moderate dosage.

In the hospital in which I am working 25 adult cases of bacillary dysentery were treated with sulphaguanidine during the past year. Each patient received 51 g. in the following dosage: 9 g. daily for 3 days, then 6 g. daily for 4 days. The fluid intake was at least 5 pints per day. Urinary examination during the course showed crystals and red blood cells in 14 patients, and crystals alone in 4 patients. A morbilliform rash developed on the tenth day in 3 cases where crystals and red blood cells had appeared in the urine 4 to 6 days prior to the rash. This suggests that daily urinary examination is advisable when giving sulphaguanidine. These crystals are colourless, rectangular, and variable in size. They are easily recognized by their uniform shape, and, in addition, give the sulphonomide colour reaction.

I would be interested to hear whether Dr. Smith's cases showed any evidence of renal damage before the appearance of the toxic rash.—I am, etc.,

Whittingham, Preston.

J. H. S. WHYTE.

### Nutritional Neuropathies in Spain

SIR.—In the latter part of the article appearing in your issue of Feb. 26 the statement is made: "The appearance of classical pellagra in Madrid, where the population never ate maize, put nicotinic-acid deficiency on a firm aetiological footing: quick response to treatment with nicotinic acid clinches the matter." This appears to be very ambiguous. If it be intended

to suggest that this is the first time a population has developed pellagra when partaking of a non-maize diet it is incorrect. That this could occur was proved thirty years ago.

It is also not very clear what treatment with nicotinic acid "clinches." The results of treatment with this substance have been known for years. The impression is also given that Peraita's observations are all new, but the conditions he has described, though new to Spanish observers, were described many years ago.—I am, etc.,

London, W.1.

HUGH S. STANNUS.

### Chloroform Anaesthesia

SIR,—Dr. H. Parry Price (Feb. 19, p. 263) advocates a "crusade" against the use of chloroform. Such a crusade has been going on to my knowledge for 25 years and probably longer. As a student I was taught *not* to use chloroform, instead of *how* to use it. I learned to view chloroform in its correct perspective from an old G.P. who always uses chloroform and nothing but chloroform, and does not, in fact, know how to use anything else but chloroform. He pours chloroform on the mask as most doctors do ether, saying to the patient, "Take good deep breaths, and the deeper you breathe the sooner you will be asleep"; and in over 40 years of general practice he has never had a catastrophe.

The chloroform-phobia that afflicts our profession is astonishing. Of course chloroform is a dangerous drug; and what are we trained for if not to learn how to use dangerous drugs? If the toxicity of chloroform is assessed in relation to its greater power as an anaesthetic I doubt if it is any more lethal than ether. One must not, of course, give chloroform to a toxic, cardiac, or hepatic patient; nor must one give ether to a bronchitic patient. Certainly chloroform can cause liver damage; so can ether cause pneumonia. Chloroform has caused deaths from heart failure on the operating table; and I have seen an apparently normal healthy woman of 34 die at the end of an operation for removal of fibroids, having had nothing but pure open ether, for no reason that anyone could discover. Of all the foul and revolting anaesthetics commend me to ether (I have myself been put to sleep by pure ether on one occasion and pure chloroform on another); the spectacle of a house-surgeon and three nurses struggling with a coughing, spluttering, vomiting, fighting patient in the attempt to anaesthetize him with ether is not one of which our profession can be proud. Moreover, with a patient accustomed to alcoholic drink ether may be useless. I have in mind one whom I would defy any anaesthetist, however skilled, to put to sleep with open ether, let alone reduce him to surgical anaesthesia.

I read that "the expert has abandoned chloroform altogether." Passing over the implication that no G.P. is "expert" and assuming that your correspondent means the consultant anaesthetist in hospital, I am aware that the latter now has a predilection for an apparatus that looks like a cross between an oil refinery and a B.B.C. transmitter, in which the cyclopropane, like the music, "goes round and around and comes out here," which is a lovely toy for those with a taste for gadgets; but the G.P. can hardly carry a hundredweight and a half of machinery in his waistcoat pocket, and consequently the G.P. uses chloroform, and will continue to use chloroform until something equally powerful, convenient, pleasant, and, without, less toxic is discovered.—I am, etc.,

Saltash

W. H. SPOOR.

### Fainting in Blood Donors

SIR,—The authors of this report to the Medical Research Council (Feb. 26, p. 279) are unable to draw any conclusions from an analysis of the data given, except to state that 45% of the donors who fainted gave a history of having done so on some previous occasion. They grouped them in ages, sexes, civil status, menstrual, married and single, following classical aetiological procedure. But this failed to reveal the secret of the fainting donor. If one examines the symptoms described and were asked to make a diagnosis one would report as follows. Excluding convulsions these are cases of autonomic nervous system disturbance. It appears possible

that the fainting donor is an example of a psychosomatic reaction of the anxiety type. The aetiological factor would be a group or system of ideas connected with blood or injury, or a past traumatic experience long forgotten which, when combined with the bleeding technique, would produce an anxiety reaction. I am bleeding donors who are also my patients, and from my small personal experience fainting and collapse occur in persons who have experienced psychosomatic disorder during difficult life situations before.—I am, etc.,

Grange-over-Sands.

DUDLEY MULKERN.

SIR,—The writers of the report to the Medical Research Council appear puzzled as to the factors behind this condition. Forty-five per cent. of the donors give a history of having fainted on a previous occasion—e.g., when giving blood or at the dentist. It is well known that many people are afraid of having operations performed on them. I suggest that the majority of the patients, probably all, were frightened. As a result the symptoms and signs ranging from feelings of warmth, pallor, or dizziness to vomiting, loss of consciousness, etc., were produced via the endocrine-autonomic system.

Observation of the patients for the other usual objective evidences of fear, together with an adequate feeling relationship between the patients and those in charge of the bleeding, would have made this point clear. There has been some discussion in your columns recently about the part played by psychological medicine in the future curriculum. A knowledge of the bodily changes produced by emotions should certainly be more widely spread.—I am, etc.,

S. D. MITCHELL.

E.M.S. Psychiatrist.

### Preventing Necrosis of the Skull

SIR,—I am interested in the correspondence on the operation of drilling holes in the external table to let the granulations grow through. I did this operation in the spring of 1901, when I was house-surgeon at the old Royal Infirmary at Newcastle-upon-Tyne. I did it on the instruction of my chief, the late Prof. J. Rutherford Morison. I always thought it was an original idea of his, and he should have the credit for it. I hope this will fill the gap in Prof. Grey Turner's memory. He was surgical registrar at the time, and at a later date trephined the same patient.—I am, etc.,

Sunderland.

R. H. DIX.

### Just Suggestion?

SIR,—Dr. J. Frankland West in his letter (Feb. 19, p. 267) seems to have come to the inevitable conclusion about what he calls his "fibrositis"—that many things will relieve the symptoms, but that current medical practice can do nothing to remove them once and for all. I would suggest that *just* so long as the medical profession fails to take into account the work of F. Matthias Alexander, just so long will they be defeated by these and similar problems. Alexander has shown by his work that our general functioning is profoundly influenced by the way in which we use ourselves in all our daily activities, and that by constantly misusing ourselves in the simple activities of living we are bringing a constant influence for ill to bear upon our general functioning. Until we realize this fact our diagnosis is bound to be incomplete, and we demonstrate our lamentable ignorance when we content ourselves with uttering the latest catchword of medical terminology. Dr. F. G. Crookshank has written: "Diagnosis, which, as Mr. Bernard Shaw has somewhere declared, should mean the finding out of all there is wrong with a particular patient and why, too often means in practice the formal and unctuous pronunciation of a Name which is deemed appropriate and absolves from the necessity of further investigation."

Dr. F. M. R. Walshe, in his stimulating article (Feb. 5), has given Crookshank's work the recognition it deserves. It is inevitable that Alexander also will eventually get recognition from those concerned with medical education. Meanwhile, Dr. West will perhaps find that a study of Alexander's work will give him a more hopeful approach to his problem.—I am, etc.,

London, S.W.1.

WILFRED BARLOW.

## Obituary

J. W. H. EYRE, M.D., M.S., F.R.S.E.D.

With the passing of Prof. John William Henry Eyre bacteriology in this country has lost one of its outstanding personalities. He was born in 1869 and, after being educated at first privately and then at the Whitgift Grammar School, entered Guy's Hospital Medical School as a student at the age of 20. He quickly qualified M.R.C.S., L.R.C.P., and graduated M.B., B.S. of Durham University. Within a few years he had also obtained both the M.D. and M.S. degrees, and had meanwhile received his first appointment to Guy's Hospital (1894)—namely, that of ophthalmic assistant and registrar. For a time he devoted himself mainly to these duties. But the remarkable aptitude which he showed later for laboratory investigation almost at once declared itself, and his work, carried out under Washbourn's influence, on the normal bacteriology of the eye and a series of papers on tuberculosis of the conjunctiva stand as classics to this day. At this time the potentialities of medical bacteriology were becoming obvious to everyone, and, increasingly attracted to the new work, Eyre in 1899 took up the post of bacteriologist and lecturer at Charing Cross Hospital. Coincidentally the Council of the B.M.A. awarded him the first Ernest Hart Memorial Research Scholarship, and then, within three years, he returned to his old hospital, succeeding Dr. Washbourn as bacteriologist to Guy's.

The present generation will scarcely credit the smallness of the space considered in those days adequate for the bacteriology of a large hospital. Eyre had first to work in minute quarters near the old bakery. But, quite unaffected by this handicap, he at once began vigorously to help in the advancement of his subject. In 1905 we find him co-opted by the Royal Society to the Advisory Board of the Commission on Mediterranean Fever, acting as chairman of the working party in Malta and making valuable contributions to the final report. Over the same period he did much work in improving the prevailing laboratory methods, culminating in his famous book, *The Elements of Bacteriological Technique*. His papers on pneumonia and pneumococci and the causes of institutional dysentery were also noteworthy. Such activity was bound to call for enlargement of his laboratories, and in 1910 a large new bacteriological department was developed at Guy's entirely to Eyre's own design. Accommodated in buildings adjoining the older surgical wards, these new premises formed for many years one of the show departments of the hospital, remaining a model of their kind and successfully meeting every new demand upon them right up to the time of his retirement in 1934. The systems which Eyre devised for handling records and accounts, as well as the actual technical work, have formed the basis of much subsequent routine laboratory development, and it is remarkable that an organization so firmly standing the test of time should have been designed when the science itself was still so very young; proof, indeed, of Eyre's exceptional foresight with regard to his specialty. Appreciation of his work was shown by appointments as Erasmus Wilson Lecturer and a Hunterian Professor at the Royal College of Surgeons and Milroy Lecturer before the Royal College of Physicians. In 1920 the title of professor of bacteriology in the University of London was conferred upon him, Eyre having already held a readership in the subject for many years. Just previously, throughout the last war, he had acted as bacteriologist to R.A.F. and other wartime hospitals, and was a member of both the Trench Fever Committee of the War Office and the Chemical Warfare Committee of the Medical Research Council. As an examiner he was excellent; always fair, always courteous. For the University of London he acted in State medicine from 1911 to 1915 and in bacteriology between 1923 and 1928. For the Royal College of Surgeons he examined in public health from 1917 onwards and in tropical bacteriology from 1911 to 1920. A most efficient chairman, whether of scientific meetings or administrative committees, his activities in this direction seemed endless. Notably he was president of the Royal Microscopical Society (1920-1), of the Hunterian Society (1939-42), and of the Royal Institute of Public Health and Hygiene (1942). He had also served as president of the

Section of Bacteriology and Pathology at the Annual Meeting of the British Medical Association in 1913.

Eyre's interests and reputation extended far beyond his own country, and he was an active corresponding member of both the Société de Pathologie Exotique and the Société de Pathologie Comparée. His editorship of the revised English translation of *Experimental Bacteriology*, by Kolle and Hetsch, was masterly. Not all his work was, however, experimental: much of it had very direct clinical bearing, and his power to apply his laboratory research to the needs of everyday medicine is well illustrated by his collaboration with Dr. Bosanquet (1909) in a small but very practical book *Serums, Vaccines, and Toxins in Treatment and Diagnosis*. Even then one has not catalogued all his activities. For a great many years he held the appointment of bacteriologist to the Worshipful Company of Fishmongers, which accounts for a series of reports upon the bacteriology of the various edible molluscs, the most notable being, perhaps, on the oyster in relation to public health in 1924. His methods of systematic prevention of pollution of the nation's supplies must have prevented many epidemics. In addition to all this he was throughout his long life a very prominent Freemason, reaching high office and living according to the very highest traditions of the craft. As seen from the dates already given advancing years did little to reduce Eyre's activity, and his career is remarkable in extending continuously from the very earliest days of clinical bacteriology right down to the present time. It must have been a great satisfaction to him to see how many of his own earliest technical innovations would obviously long survive him. There is no doubt that practical bacteriology as we know it to-day owes much to Eyre's inventive genius.

A man serving so long as 32 years on the staff of one teaching hospital must inevitably have appeared in somewhat different lights to succeeding generations of Guy's men, but from beginning to end everyone knew, loved, and honoured "Johnny" Eyre. Whether one met him as colleague, student, or patient, there was something so dynamic in his personality that its origin in one of such minute stature always remained somewhat of a mystery. His energy was extraordinary and devoted unsparingly to every task or problem he met. Success never spoiled him; he was entirely without conceit. One so small was fated to be the student caricaturist's joy, and the *Gazette* of his hospital carries many humorous but always kindly reminders of at least one characteristic which he shared with the minute beings he delighted to study. No one ever asked his help in vain, and it is doubtful whether one has ever heard more expressions of true appreciation and affection than came from his many friends who attended the farewell dinner given to him when he retired from Guy's. Those who actually worked with him would go further. There are many to-day engaged in the laboratory aspects of medicine who owe much not only to Eyre's inspiration but to his unflinching interest in the welfare of everyone, from the highest to the lowest, who ever worked in his department. For his immediate colleagues a great man's memory will indeed outlive his life. F. A. K.

Dr. T. BLANCHARD SELLORS writes: Prof. Eyre's friendship was a privilege I enjoyed for forty years, since, in fact, the time he was making up his mind to give up eyes for "bugs." In those days few, if any, hospitals had a special chair in bacteriology, and for a few years he acted as assistant to Dr. Washbourn, then in charge of public health at Guy's. He was given the new appointment of bacteriologist at Charing Cross, returning to Guy's when a similar post was created there. He was a tireless worker, and practically died, as he had lived, in harness: no amount of persuasion could induce him to retire. His spare time was chiefly devoted to Freemasonry, wherein he was a Past Deacon of Grand Lodge and Past Master of the Grenadiers and Aesculapius Lodges. We worked together for three years in preparing the history of the first named for its bicentenary in 1939, and though the festival had to be abandoned on account of the war, the volume remains for me as testimony to a frequent and very friendly collaboration. Others can write with better knowledge of his professional attainments, but only those who knew him could tell of the happiness of his family life, the worth of his friendship, and the value of his varied experience. Few of his colleagues, by the way, are aware that he was a successful journalist before adopting medicine as his life's work.

WILLIAM ROBINSON, M.D., D.P.M.

Dr. William Robinson died at Tankerton on Feb. 21. He was the younger son of William Henry Robinson, was born at Skipton, Yorkshire, on Oct. 19, 1888, and was educated at Skipton Grammar School, proceeding to the Medical School at Leeds University. There he had a very distinguished career

as a student, obtaining many prizes and honours, including the gold medal for anatomy in his year. He graduated in medicine with honours in 1911.

Immediately after qualification he undertook the "summer locum" at the West Riding Asylum, Wakefield, and this temporary appointment was destined to influence his whole life, as previously his intention had been to follow a surgical career. After a few weeks in private practice he returned to Wakefield as assistant medical officer on the permanent staff. Hard work and scrupulous care earned him rapid promotion. In 1913 he obtained the D.P.M. of Leeds, becoming one of the earliest holders of this diploma from that teaching school, and he followed Henry Devine as deputy to Prof. J. Shaw Bolton, at that time medical director. When war broke out in 1914 he immediately offered his services, was fortunately appointed a Command Psychiatrist, and at once went over-seas. He served in this capacity in France until the end of hostilities. He returned to his duties at Wakefield Mental Hospital in 1919, and in 1920 obtained the M.D. degree of Leeds University. He later published his thesis, *The Future of Service Patients in Mental Hospitals*; this was regarded for some years as a classic and quoted on many occasions. In the same year he was appointed at the early age of thirty-two medical superintendent at Brentwood Mental Hospital. After five years' strenuous work there he was appointed medical superintendent at the City of London Mental Hospital, Dartford, a position he resigned on medical advice on Nov. 1, 1943.

His work as medical superintendent at Brentwood and Dartford was indefatigable, and both institutions owe much to him. His first consideration was for the welfare and comfort of the patients under his care; they came first, and next he valued a contented and happy staff, his efforts always being for those with whom and among whom he worked, starting with the most lowly. While at Dartford he had many outside interests; besides being consultant psychiatrist to several of the surrounding general hospitals he was an active member of the local hospital committee and medical adviser to two other general hospitals. A considerable amount of Robinson's best work will never be known; much time and labour, much advice, he gave "behind the scenes." To those who knew him some of the terms used in the 1930 Act were already familiar.

William Robinson joined the B.M.A. in 1926. He was secretary of the Dartford Division from 1937 to 1939; chairman of the Division from 1929 to 1931, and from 1935 to 1936; and president of the Kent Branch from 1932 to 1933. He was secretary of the Local Medical War Committee from its inception until October, 1943. His duties in this latter position were not always easy, but his tact in handling difficult matters was appreciated both locally and centrally. By his early passing there has been lost to medicine a physician, a psychiatrist, an administrator, all of outstanding merit.

Dr. JAMES PRIOR, formerly a well-known and much-respected practitioner in Heckmondwike, died at the end of last year at Adel, Leeds. He was a native of Dewsbury and studied medicine at the Leeds Medical School and St. Thomas's Hospital, London, qualifying as M.R.C.S., L.R.C.P. in 1894. Returning to Dewsbury he served for 4½ years as resident-house-surgeon at the Infirmary, and in 1900 began private practice at Heckmondwike. He spent 23 years as medical officer and public vaccinator for the district, and was for a long period medical officer to the Staincliffe Infirmary and surgeon to the Dewsbury Infirmary. Dr. Prior joined the B.M.A. in 1903 and held office as chairman of the local Division in 1926-7; he retired from practice in 1933. He did good work for the St. John Ambulance Brigade and had many interests outside his profession.

The death of Dr. R. MUZIO WILLIAMS on Dec. 14 came as a great shock to his many friends, for, in spite of his 84 years, he always appeared to be full of youth and energy, and indeed had been in London at a luncheon of the United Hospitals Club only a few days before. Born in 1860, he was the fourth son of Henry Owen Williams, D.L., J.P., who was High Sheriff of Tre-Ardur and Tre-Castell, Anglesey. At St. Thomas's Hospital he gained the first entrance science scholarship in 1879. He qualified M.R.C.S. and L.S.A. in 1884, L.R.C.P. in 1885, M.B.Lond. in 1887, and M.D. in 1888. In 1885 he was appointed resident house-physician at St. Thomas's, and from 1886 to 1887 he held the post of resident at the London Fever Hospital. The next year found him as a ship surgeon in the *s.s. Magellan*, in which he served for eight months; and in 1889 he became medical officer to the Florence Nightingale Hospital for Gentlewomen. In 1881 he married and settled down in general practice in the area round Hyde Park, where he continued until his retirement. "Muzio"—as he was known to his friends—was the ideal type of general practitioner, equally at home with and acceptable to peer or pauper, man, woman, or child; and was as dearly loved by his patients as by his

friends, many of whom will remember him for his humour, his unfailing kindness, and the thoroughness he displayed in everything he undertook. With each of his patients every small detail was gone into, and the most minute instructions were given, in fact usually written—an example which younger generations of medical men would do well to follow. In 1921 he took a partner with a view to retiring from practice, which he did in 1923. No man ever showed more loyalty to his partner or worked harder to further his successor's interests. He retired to live at Midhurst, and in retirement his unbounded energy, always devoted to his fellow men, found him on the Board of the Royal West Sussex Hospital, of which he became chairman 1929-30; and it was during this term of office that he had the honour of receiving the Princess Royal when she opened the David Ewart Memorial Nursing Home. In the same year he was made a J.P. for Sussex. He was a most enthusiastic St. Thomas's man, following all the hospital's activities so far as he could, frequently arriving there with patients—often in the middle of the night—and, when his work permitted, turning out to see the hospital play in the inter-hospital rugby matches. There were few gatherings connected with the hospital at which he was not to be seen. He was a keen member of St. Thomas's and Guy's United Hospital Club, and a regular attendant at all its dinners and lunches; in 1930 he took the chair at the St. Thomas's Old Students' annual dinner. At the end of the last war, when a fund was started as a memorial to old St. Thomas's men who had died for their country, he was instrumental in collecting a large part of the money, and served on the committee entrusted with its administration. His life was a great example in carrying out the ideals of the medical profession.

W. H. C. R.  
E. N. S. R.

Dr. LAURENCE JAMES BLANDFORD of Worcester died after a short illness on Feb. 29. He was born at Coxhoe, Durham, in 1876 son of Col. J. W. Blandford, and received his education at Repton School and Durham University. He graduated M.B., B.S. in 1899, and after a house-surgeoncy at the Royal Victoria Infirmary, Newcastle, proceeded to the M.D. in 1902, and some years later took the D.P.H. of the Dublin Royal Colleges, with honours. Dr. Blandford attained the rank of colonel A.M.S.(T.) in the last war, and was awarded the C.B.E. and Territorial Decoration in 1919 for his services with the 50th Division. After the war he became Deputy Commissioner for Medical Services under the Ministry of Pensions, and later Principal Medical Officer for the Midlands Region. He had been M.O.H. for Stockton-on-Tees Rural District and honorary surgeon to the Stockton and Thornaby Hospital. He joined the B.M.A. in 1900 and represented his Division at three Annual Meetings. He served at headquarters on the Naval and Military Committee, on the Territorial Force Committee, and on the committee concerned with expansion of Army Medical Services in case of national emergency.

Dr. PERCY JAMES KELLY died at Maidstone on Feb. 12 after a short illness, aged 68. He studied medicine at the University of Glasgow, and after qualifying M.B., Ch.B., joined the Colonial Medical Service in 1908. He served in Nigeria, Hong Kong, and Ceylon, where he was Registrar of the Medical College, and in British Guiana, where he was Surgeon-General from 1922 to 1932, in which year he retired and was awarded the C.B.E. During the last war Dr. Kelly was a captain in the R.A.M.C. at Salonika and in France; in 1936 he led the second Red Cross expedition to Abyssinia, which reached Gondar before it was compelled to retire by the victorious Italians. During the present war he served in several ships of the Merchant Navy which took part in the North African and other operations; he was about to sail again when his life was cut short. Dr. Kelly was president of the British Guiana Branch of the B.M.A. in 1927-8. He leaves a widow, two sons who are now serving with our Forces on the Burma Front, and two daughters. The elder son is Major L. M. Kelly, I.M.S.

The medical profession, general practitioners in particular (writer H. C. P.), are the poorer by the sudden and tragic passing of ARNOLD GEORGE TOLPUTT on Feb. 18. Of that truth ample evidence was provided by the gathering of every class of the community assembled at Kettering Parish Church on Feb. 21 to pay their last tribute of respect and affection to his memory. Every body, every organization, ambulance, fire brigade, wardens and A.R.P. personnel, police, town council, hospital staff, nursing and medical, those with whom he had spent so much of his time with untiring devotion, skill, and energy, in addition to a host of his patients and friends, were all there in token of their gratitude to Arnold Tolputt for his unfailing kindness and generous character. He came to Kettering well over 40 years ago as locumtenent with Dr. Paul Roughton, who was not slow to realize that he had discovered a man of outstanding ability and character. A firm and lasting friendship



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and successful partnership were soon established. As I am proud to think, one of his oldest friends, I am as well qualified to express, though imperfectly, the appreciation of a colleague who was a man in the truest sense, a loyal friend, one who was honest and straightforward in his dealings with all men and a practitioner of marked ability and wide experience. I look back with pleasure on very many happy hours during the last 43 years spent in co-operation and friendly rivalry with him in our professional and social activities. To say that we shall miss him does not express all that we feel. It can be truly said of him, "Well done, thou good and faithful servant."

Dr. LYDIA ANN LENEY died in London on Feb. 15. The daughter of Edmund Lenev, she was born at Lewes, and from Cheltenham Ladies' College entered the London School of Medicine for Women. In 1895 she took the Scottish Triple diplomas and in the following year obtained the L.M. of the Rotunda Hospital and the M.D. of Brussels University. Her main professional interests were ophthalmology and instruction of mothers in the care of children. Dr. Lenev was for some time assistant R.M.O. at the Medical Mission Hospital, Plaistow, and then M.O. in charge of the Mary Ward School for Mothers. With this work she combined that of oculist under the old London School Board; later she became chief assistant at the Royal London Ophthalmic Hospital, refractionist to the L.C.C. Clinic, Battersea, and examiner and lecturer in first aid, home nursing, and infant care under the L.C.C. She joined the B.M.A. in 1898 and was a member of the Oxford Ophthalmological Congress and the West London Medico-Chirurgical Society.

Dr. ROBERT NIMMO WATSON died suddenly at his home in Harrogate on Feb. 15, aged 67. He was born at Invercargill, New Zealand, and studied medicine in London at the Westminster Hospital, where after qualifying M.R.C.S., L.R.C.P. in 1900 he held house appointments. He joined his cousin, the late Dr. Crawford Watson, at Harrogate in 1902 and became honorary physician to the Royal Bath Hospital and Rawson Convalescent Home; he also served for 40 years as medical officer to the Northern Police Convalescent Home and Orphanage. Dr. Watson joined the B.M.A. in 1903 and was a member of the International Society of Medical Hydrology. He had been president of the Leeds and West Riding Medico-Chirurgical Society and of the Harrogate Medical Society. During the last war he served over-seas with the rank of temporary captain, R.A.M.C.

We regret to announce the death on Feb. 21 of Dr. HERBERT HALL, who had a large practice at Hartlepool, and was senior honorary physician to the Hartlepool Hospital. He was born near Dublin in 1898, and graduated M.B., B.Ch., B.A.O. of Dublin University in 1922, after serving in the last war as surgeon probationer R.N. He became house-surgeon at the Hartlepool Hospital in 1924, and a year later, when he joined the late Dr. Brogden in partnership, he was appointed to the honorary staff, and also held the posts of district medical officer, public vaccinator, and police surgeon. In his private practice Dr. Hall won the affection of his patients and proved himself a good and kind friend to many poor families. He had a particularly warm regard for children, and did much to help young people in Hartlepool, as the probation officers and other welfare workers can testify. Dr. Hall joined the B.M.A. in 1925, and was elected chairman of the local Division in 1936.

Mr. WILLIAM MCGREGOR YOUNG of Leeds, who died last month, was educated at the University of Glasgow, taking first an Arts course and graduating M.A. in 1885. He then became a medical student and took the degrees of M.B., C.M. in 1889 with commendation, and proceeded M.D. in 1901. Throughout the whole of his medical career he practised in Leeds. He was for many years honorary surgeon to the Leeds Maternity Hospital and surgeon to the Leeds Southern Dispensary. He joined the B.M.A. in 1897 and had been an active member of the North of England Obstetric and Gynaecological Society and of the Leeds and West Riding Medico-Chirurgical Society. In former years he often acted as anaesthetist for the late Lord Moynihan, and he wrote the article on ether for the *Encyclopaedia of Medicine*. Long before 1914 he had been a keen Volunteer, and during the last war he was in command of the 2nd West Riding Field Ambulance with the rank of lieutenant-col. R.A.M.C.(T).

We regret to announce the death in retirement at Oulton Cross, Stone, Staffordshire, of Mr. REGINALD ALCOCK, C.B.E., F.R.C.S.Ed. He was born in 1868, son of John Alcock, J.P., of Portland House, Burslem, and was educated at Owens College, Manchester, where he won the Hulme Hall Scholarship. He graduated M.B., Ch.B. of the Victoria University in

1893 and took the F.R.C.S.Ed. diploma in 1910. He then returned to the Potteries and spent the rest of his life there, serving many years as surgeon to the North Staffs Royal Infirmary and consulting surgeon to the Leek Cottage Hospital and the Haywood Hospital, Burslem. During the last war he was senior surgeon to the Stoke-on-Trent War Hospital, and for that service was awarded the C.B.E. in 1919. Mr. Alcock joined the B.M.A. in 1894, had been honorary secretary of the North Staffs Division, and in 1922 president of the Staffordshire Branch; he was also a vice-president of the North Staffs Medical Society.

Dr. Muriel Barton Hall writes: May I add my regret to that of another correspondent at the passing of HERBERT NORT. He practised for many years not at Long Sutton, but at Little Sutton, where he was loved and respected by his patients. He brought my four younger sisters into the world, and I recall from an early age his dapper figure walking into the house unannounced, his confident, reassuring manner, the twinkle in his eye, and, as I grew up and became a medical student, evidence of his skill and efficiency. He was the perfect general practitioner to rich and poor alike, and his decision to give up his country practice in order to specialize was a grievous loss to his patients, many of whom still recall his services with admiration and gratitude.

## Medico-Legal

### SURVIVORSHIP IN AIR RAIDS

The succession to property sometimes depends on which of two or more persons involved in a common calamity dies before the others. Before the sweeping changes which Lord Birkenhead introduced into property legislation in 1925, the law assumed that "commorientes" died simultaneously unless evidence showed otherwise. The Law of Property Act, 1925, Section 184, provided that where two or more persons have died in circumstances which render it uncertain which of them survived the others, then the deaths are presumed to have occurred in order of seniority, the younger surviving the elder. In 1942 Mr. Justice Bennett tried the first case under this section arising from an air raid. A husband and wife were found dead after a bomb had fallen on the house where they were sleeping in the same room, but the judge held that their simultaneous death had to be positively proved by evidence, and he did not find the evidence brought in favour of it strong enough to override the presumption that the younger survived the elder.

This somewhat unsatisfactory result, though it seemed to accord with the wording of the statute, has now been modified by the Court of Appeal.<sup>1</sup> Five members of a household were killed together in a basement shelter by the same bomb. A brother of two of the victims, claiming as a residuary legatee of one and next of kin of the other, claimed that, as no proof was given that the victims had died together, they should be deemed to have died in order of seniority, which would have had the effect of invalidating wills made by some of the victims. The Master of the Rolls, Lord Greene, said that the first question was whether as a matter of law two persons can ever die simultaneously. Counsel had argued against the plaintiff that the law does not recognize this possibility because, as time is infinitely divisible, one of two persons must always in fact die before the other, though it is usually impossible to prove which died first. He described the infinite divisibility of time as a scientific fact, but Lord Greene preferred to call it a metaphysical conception. No doubt, his lordship added, when a bevy of angels is performing salutatory exercises on the point of a needle it is always possible to find room for one more. Propositions of this character appeared to him, however, to be ill suited for adoption by the law of this country, which proceeds on principles of practical common sense. To speak of the infinite divisibility of time in relation to a modern high-explosive bomb bursting among persons in a shelter seemed to him to ignore the realities of the case. He did not regard simultaneous death in these circumstances to be so improbable as some authorities, including Mr. Justice Bennett, had thought. Nor did he think that the words of the section covered the case of simultaneous death. He thought that the words "uncertain which of them survived the others" applied only to a case in which the proper inference from the facts is that the victims died consecutively; it does not, he said, apply if the court finds on the evidence that they died simultaneously. In such a case Parliament has not laid down a presumption about the order of death. To the present case the possibility of the deaths having been consecutive was too remote to be considered. He gave the warning, however, that simultaneous death need not be inferred in every case in which two persons are killed by the same bomb. Where, for example, two

<sup>1</sup> *Re Gressenior*, (1944) 1 All E.R. 81.

persons killed by blast were some distance away from one another, the court might well decline to draw the inference; and if the persons were killed by splinters the possibility that their deaths were simultaneous might be remote. Lord Justice Goddard agreed, but Lord Justice Luxmoore could not feel so certain as his brother judges that the victims had died simultaneously. He had heard of cases in which, when shelters had been hit, some of the inmates were found alive though the others had perished. The vagaries of burst and blast were notorious. He felt he would require the assistance and experience of an expert before he could conclude that two or more given persons died at precisely the same moment.

## The Services

Acting Surg. Cmdr. K. Forsyth has been awarded the R.N.V.R. Officers' Decoration.

The *London Gazette* has announced the appointment as O.B.E. (Military Division) of Capt. (Temp. Major) N. B. Hall, R.A.M.C., in recognition of gallant and distinguished services in the field.

### CASUALTIES IN THE MEDICAL SERVICES

*Wounded.*—Temp. Majors F. Elliott and A. A. C. Ross, R.A.M.C.; Lieut.-Cols. S. T. Davies and V. E. M. Lee, I.M.S.

*Prisoners of war.*—Temp. Majors P. M. Bloom and E. Egan, Capt. C. Hecht, War Subs. Capts. J. F. Clark, H. E. De Warden, J. Diver, R. W. Lennon, J. C. McNeilly, and J. E. Moss, and Lieut. P. T. Chopping, R.A.M.C.; Temp. Lieut.-Col. G. B. S. Chawla, Major K. Rai, Acting Majors S. A. Hasan and K. N. Rao, and Capt. N. G. Latey, I.M.S.

*Missing at sea.*—Capt. J. R. O. Thompson, R.A.M.C.

*Missing, believed killed.*—Surg. Lieut. D. L. Sandes, R.N.V.R.

*Died.*—Major S. W. H. Askari, I.M.S.

### DEATHS IN THE SERVICES

Air Commodore BASIL ALFRED PAYNE, D.S.O., who retired from the Medical Branch of the R.A.F. in 1938, died on Feb. 6 after a long illness at Minchinhampton, Gloucestershire. He was born in 1885 youngest son of the late Edward Payne of Minchinhampton, and from Clifton College entered Pembroke College, Cambridge, with an exhibition, taking his B.A. in 1907. He then went on to St. Bartholomew's Hospital, and qualified M.R.C.S., L.R.C.P. in 1910. After serving as extern midwifery assistant at Bart's and senior house-surgeon at the Miller General Hospital, Greenwich, he graduated M.B., B.Ch. at Cambridge in 1912. For his services as a temporary surgeon R.N. throughout the last war he was mentioned in dispatches and awarded the D.S.O. in 1915. Joining the R.A.F. he held a number of posts and became Principal Medical Officer in turn of the Aden Command, the Iraq Command, the Halton Command, and from 1934 until his retirement in 1938 of Coastal Command Headquarters.

## Universities and Colleges

### UNIVERSITY OF CAMBRIDGE

A Congregation held on Feb. 25 the following medical and surgical degrees were conferred:

M.Chir.—B. N. Brooke (in person).

M.B., B.Chir.—R. C. Barclay, K. Chitty, F. A. L. da Cunha (all by proxy).

### UNIVERSITY OF LONDON

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—IP S. London, P. Abbey, A. C. Akehurst, Winifred N. Backhouse, G. H. Bancroft-Livingston, Winifred M. Bond, W. Brand, Elizabeth T. Brash, P. Brightwell, F. S. W. Brimblecombe, H. W. Bunle, G. E. Catton, E. H. Couper, W. E. Craddock, Catherine F. Crofts, A. J. E. Duddington, P. D. A. Durham, W. H. Dyson, A. J. Eley, M. E. Evans, J. M. Fabricius, Elizabeth de C. Falle, D. L. B. Farley, S. C. Farman, J. H. Ferris, P. G. Finch, C. O. Fung-Kee-Fung, G. W. Garland, A. P. Goffe, M. E. I. Halford, L. H. Hamlyn, R. H. Heptinstall, E. G. Herzog, A. J. H. Hewer, Norah Hewison, Monica M. Hogben, J. E. Hotchin, C. A. Houlder, Elizabeth M. Hugill, R. W. L. Hurt, P. E. Jackson, B. V. Jones, E. C. B. S. Keat, Margaret Kemsley, A. B. Lee, C. A. Leeson, M. Leivers, E. Levy, W. D. Linsell, G. R. G. Mackarness, K. M. Mackenzie, T. P. Mann, C. G. Martin, L. G. C. Martin, Edith S. M. Merry, J. K. Morgan, W. S. Morgan, D. Munro-Ashman, Jean Myers, Diana J. Myott, A. Noskwith, A. W. Nurick, A. C. F. Oakley, J. P. Partridge, Cicely Penler, Marion J. Phillips, J. E. L. Price, L. Radcliffe, A. M. Rajah, D. L. Rees, T. H. Richards, D. R. S. Saunders, J. Siegler, I. R. Sinton, I. T. The, A. M. B. Tompkin, E. L. Trickey, G. Trosier, Joyce F. Tucker, E. Tuckman, K. A. D. Turk, E. C. Turner, Eileen M. Vale, R. G. White.

(With honours and distinction in surgery.)

### UNIVERSITY COLLEGE HOSPITAL

Prof. A. A. Miles, F.R.C.P., will deliver the Sydney Ringer Memorial Lecture for 1944 in the lecture theatre of University College Hospital Medical School, University Street, Gower Street, W.C., on Tuesday, March 21, at 4 p.m. His subject is "The Epidemiology of Wound Infection," and the lecture is open to qualified practitioners and medical students.

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

The following lectures, open to medical practitioners and advanced students, will be delivered this month at the College in Lincoln's Inn Fields at 4 p.m. One Hunterian Lecture by Prof. L. Leigh Collis on March 14 on the aetiology of cerebral abscess as a complication of thoracic disease; two lectures by Dr. Geoffrey H. Bourne, on March 21 on the problem of bone formation, and on March 23 on vitamin C and the regeneration of bone; two lectures by Prof. Arnold Sorsby, on March 28 on blindness in childhood, past achievements and present problems, and on March 30 on the sulphonamides in ophthalmology, their use and limitations.

*Correction.*—Owing to a printer's error in the report of the meeting of the Royal College of Physicians of London in the *Journal* of Feb. 12 (p. 239) the following names were omitted from the list of candidates who had passed the Final Examinations of the Conjoint Board:

W. R. Horstall, C. A. Houlder, Elizabeth M. Hugill, A. L. Humphrey. The initials of T. M. Humphry were wrongly given as W. R. Humphry.

## Medical News

Two organizations—the Health Workers' Council and the Social Security League—have jointly arranged a public conference on "Planning for Health: Medical Services and the Beveridge Report," to be held in the Conway Hall, Red Lion Square, W.C., to-morrow (Sunday, March 12) from 3 to 6.30 p.m. The speakers will include Dr. Haden Guest, M.P., and Dr. H. Joles.

A meeting of the Clinical Society of the Royal Eye Hospital will be held at the hospital on Friday, March 17, at 4.30 p.m., when a talk will be given by Mr. L. V. Cargill on "Sir William Bowman."

At a meeting of the Tuberculosis Association to be held at Manson House, 26, Portland Place, W., on Friday, March 17, at 3.15 p.m. a discussion on the problem of primary tuberculosis in children, especially in the under-5 age group, will be opened by Drs. W. Gaisford, W. Richards, A. Margaret Macpherson, and G. Jessel. Members of the British Paediatric Association have been invited to take part in this joint discussion.

Dr. Innes H. Pearce will give a public lecture on "The Peckham Experiment" on Wednesday, March 22, at 6.45 p.m. in the Alliance Hall, Palmer Street, Westminster, S.W. Applications for seats to be reserved should be sent to the Secretary, Science (Research) Society, 31, Broadhurst Gardens, Eastcote, Middlesex.

The London School of Hygiene and Tropical Medicine has arranged a week-end course for medical practitioners on Factory Medical Services and Industrial Diseases on Saturday and Sunday, March 25 and 26. The session on March 25 will be opened at 2 p.m. by Sir Wilson Jameson and will be devoted to tuberculosis and the industrial worker and to industrial diseases of coal-miners. At the morning session on March 26 medical inspection of canteens and young persons in industry will be discussed, and in the afternoon a paper on medical selection of factory personnel will be followed by a medical "brains trust." The fee of one guinea for the course (and 2s. 6d. if lunch is required on Sunday) should be sent to the Secretary of the School, Keppel Street, W.C.1, not later than March 20.

It was announced in 1941 that since large quantities of phenol were required for purposes directly connected with the war, its use for other purposes should be restricted as much as possible. We understand that the supply position has improved, and that increased quantities are now being made available for medical use.

At a meeting of the Central Midwives Board for Scotland, Prof. R. W. Johnstone, P.R.C.S.Ed., and Prof. James Hendry were elected Chairman and Deputy Chairman respectively for the ensuing year. Examiners were appointed and institutions were approved for the training of pupil midwives.

By an amendment, which became official on Feb. 18, a monograph on liquid extract of belladonna leaf has been added to the *British Pharmacopoeia*, 1932. In future when liquid extract of belladonna is prescribed or demanded, liquid extract of belladonna leaf may be dispensed or supplied.

The supply of rubber gloves to hospitals and similar institutions, and through them to doctors, nurses, and midwives for use in institutions will continue to be controlled centrally by the Priority Officer of the Ministry of Health as at present. For doctors in private practice the ration will be six pairs a year, and applications for certificates should be made to the Central Medical War Committee, B.M.A. House, Tavistock Square, W.C.1, marking the envelope "Gloves" and enclosing a stamped addressed envelope for reply. Applications for "supplementary rations" should be made to the Regional Offices of the Ministry of Health.

The December issue of the *Medical Record* of New York is a Neuburger number devoted to Prof. Max Neuburger, the eminent medical historian, in celebration of his 75th birthday.

The Marcel Benoist prize for 1943 has been awarded to Prof. Arthur Stoll of Basle for his work on pharmacological chemistry.

Dr. H. G. Massiah has been appointed a member of the Legislative Council of the Island of Barbados.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* during the week there were rises in the incidence of measles by 375, scarlet fever by 193, acute pneumonia by 65, and of dysentery by 57 cases; the notifications of whooping-cough fell by 184. The deaths from influenza in the great towns have steadily dropped since the week ending Dec. 11, when 1,148 were recorded; there were only 38 deaths during the week under review; but the returns for the week ending Feb. 26 show an increase of 8 deaths.

There was an increase in the incidence of scarlet fever in most areas, the largest being in Warwickshire, with 34 more cases. Notifications of whooping-cough were down by 51, 49, and 38 in Yorks West Riding, Lancashire, and Sussex respectively, and up by 25 in London and 24 in Middlesex. During the past six weeks the incidence of measles has been trebled; the largest increases during the week were in Kent by 91, in Norfolk by 89, and in Lancashire by 87.

Dysentery, with 277 notifications, was again on the increase, the returns being the highest for any week during recent years except for two occasions in 1943. The only fresh outbreak of any size during the week was in Shropshire, Ludlow R.D. 26. The cases rose from 31 to 61 in London and involved seventeen boroughs (Hackney 23, Islington 11). The largest of the other centres of infection were Surrey 24, Glamorganshire 21 (Cardiff C.B. 20), Lancashire 16, Middlesex 13, Warwickshire 10.

In *Scotland* cerebrospinal fever and dysentery rose in incidence by 16 and 63 cases respectively, the notifications of these diseases being the highest during recent months. Half the 33 cases of cerebrospinal fever were reported from the city of Glasgow. The principal outbreaks of dysentery were Ayr county 61, Glasgow 20, Aberdeen county 10. There was a slight rise in the notifications of scarlet fever by 15 cases, and there were 35 fewer cases of whooping-cough, 26 of acute primary pneumonia, and 10 of measles.

In *Eire* there was a further small rise, 10, in the notifications of diphtheria. Of the 324 cases of measles 295 were notified in Dublin C.B.

### Smallpox: A Warning

Smallpox has appeared in the county of Middlesex, at Mount Vernon Hospital, where 3 out of 8 patients with the disease have died. A number of people have visited the hospital, and as many as possible have been traced and offered vaccination or re-vaccination. Practitioners are urged to be on the look-out for cases, and to seek advice from the regional or central medical staff of the Ministry of Health and the L.C.C. if in any doubt as to the nature of an eruption.

### Week Ending February 26

The returns of infectious diseases during the week in *England and Wales* included: scarlet fever 1,948, whooping-cough 1,810, diphtheria 690, measles 1,796, acute pneumonia 858, cerebrospinal fever 75, dysentery 234, paratyphoid 6, typhoid 7. The deaths from influenza in the great towns numbered 46, an increase of 8 on the total of the preceding week.

### Points from Abroad

According to a statement in the Swedish press last month Berlin is suffering from a plague of rats because refuse has not been removed for months. There is fear of contagious diseases, and hundreds of cases of tularaemia have already occurred in Berlin, although there had not been a single case for decades.

Last month about 5,000 cases of plague were reported in Adrianople, and quarantine restrictions were placed by Turkey on those crossing the Bulgarian frontier.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 19.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	67	1	33	1	3	96	9	27	5	3
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Diphtheria .. ..	689	29	188	158	28	828	38	188	96	32
Deaths .. ..	11	1	4	6	1	25	2	5	7	1
Dysentery .. ..	277	61	141	—	—	89	7	38	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Encephalitis .. ..	—	—	1	—	—	—	—	1	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Erysipelas .. ..	—	—	39	18	2	—	—	62	6	2
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Infective enteritis or .. ..	..	..	..	..	..	..	..	..	..	..
Deaths .. ..	55	13	9	12	8	45	7	10	14	4
Measles .. ..	1,620	226	147	324	1	18,215	1,182	363	21	52
Deaths .. ..	1	—	1	—	—	24	—	—	—	—
Ophthalmia neonatorum .. ..	88	5	21	1	—	87	2	17	1	3
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Paratyphoid fever .. ..	3	—	2(B)	—	—	7	—	1	1	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Pneumonia, influenza* .. ..	974	46	9	6	5	1,399	73	30	5	8
Deaths (from influ- .. ..	38	9	7	1	—	102	13	10	—	6
enza) .. ..	..	..	..	..	..	..	..	..	..	..
Pneumonia, primary .. ..	—	—	199	23	—	—	—	415	24	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Folio-encephalitis, acute .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Poliomyelitis, acute .. ..	8	—	—	—	—	5	—	—	5	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Puerperal fever .. ..	—	4	10	—	—	—	3	17	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Puerperal pyrexia† .. ..	167	5	14	—	4	146	9	21	2	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Scarlet fever .. ..	2,063	115	216	32	60	1,922	134	300	41	47
Deaths .. ..	1	—	—	—	—	1	—	—	—	1
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Typhoid fever .. ..	6	—	1	9	1	6	2	3	7	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	..	..	..	..	..	..	..	..	..	..
Whooping-cough .. ..	1,825	173	124	74	17	1,581	118	4	54	9
Deaths .. ..	9	2	—	1	1	16	4	1	3	—
Deaths (0-1 year) .. ..	401	50	61	47	46	434	47	77	59	22
Infant mortality rate .. ..	..	..	..	..	..	..	..	..	..	..
(per 1,000 live births) .. ..	..	..	..	..	..	..	..	..	..	..
Deaths (excluding still- .. ..	4,984	769	653	259	169	5,200	752	742	265	165
births) .. ..	..	..	..	..	..	..	..	..	..	..
Annual death rate (per .. ..	..	..	15.0	16.9	±	..	..	16.7	17.4	±
1,000 persons living) .. ..	..	..	..	..	..	..	..	..	..	..
Live births .. ..	6,466	749	910	409	308	6,386	780	910	342	289
Annual rate per 1,000 .. ..	..	..	18.5	26.7	±	..	..	18.6	22.5	±
persons living .. ..	..	..	..	..	..	..	..	..	..	..
Stillbirths .. ..	226	32	29	—	—	231	19	40	—	—
Rate per 1,000 total .. ..	..	..	..	..	..	..	..	..	..	..
births (including .. ..	..	..	..	..	..	..	..	..	..	..
stillborn) .. ..	..	..	31	..	..	..	..	42	..	..

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

± Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.



## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### The Carotid Sinus and Carotid Body

**Q.**—What are the physiological functions of the carotid sinus and carotid body, and what is their clinical significance?

**A.**—The carotid sinus and carotid body are concerned with the reflex regulation of arterial blood pressure, heart rate, and respiration. Nerve endings—stretch receptors—in the adventitia of the carotid sinus are responsive, as are similar endings in the arch of the aorta, to changes in arterial blood pressure. They are stimulated according to the pressure exerted on the walls of the vessels; when they are stretched impulses pass, in the case of the carotid sinus, via the sinus nerve to the vasomotor centre and inhibit its tonic activity. As a result an increase in pressure in the sinus is followed by widespread vasodilatation. Reflex slowing of the heart and of breathing is also induced through the cardiac and respiratory centres by an increase in sinus pressure. The usual constancy of the arterial blood pressure is attained mainly by reflex action induced through the sinus and aortic nerves—the two nerves are indeed often referred to as "buffer" nerves.

Associated with the sinus is the carotid body containing chemoreceptors which are stimulated by blood- $\text{CO}_2$ , tension rising above, and  $\text{O}_2$  tension falling below, threshold levels. Stimulation of the receptors results, reflexly, in increase in vasomotor centre tone and stimulation of breathing. The aortic bodies react similarly. The removal of  $\text{CO}_2$  and the maintenance of its optimum level and the supply of oxygen to the organism are therefore important functions of the carotid body. For details and experimental proof regarding these mechanisms the questioner is referred to Wright (*Applied Physiology*, 7th edition).

Clinically the sinus (and aortic arch) receptors are largely responsible for the maintenance and regulation of arterial blood pressure. Experimentally, hypertension can be induced in animals by section of the sino-aortic nerves, but there is little evidence that essential hypertension in man is due to dysfunction of the sinus mechanisms. Hypersensitivity of the carotid sinus reflex may be responsible for some forms of vasovagal fainting attacks. Subjects of this condition are characterized by the abnormal slowing of the heart which ensues from light or moderate pressure exerted on the neck over the carotid sinus region.

#### Bilateral Recurrent Parotitis

**Q.**—A patient aged 37, a Sino-Portuguese by birth, was born in Macao and has spent many years of her life in India. She has complained for the last three months of an intermittent swelling and pain at the angles of her jaw. On examination I have found that both parotid glands have been swollen, the right more so than the left. The swelling subsides so rapidly that on the day after I saw her the surgeon to whom I took her could find no swellings. There are no stones in the parotid duct, and there is no inflammation visible at the mouth of either duct. Can you suggest (a) the cause of this chronic parotitis, or (b) any investigations which might be made and which might throw further light on the complaint? I do not think for a moment that she has a mixed parotid tumour.

**A.**—The case is almost certainly one of bilateral recurrent parotitis. Bacteriologically, the majority of such cases are caused by the *Str. viridans*, with smaller groups caused by pneumococci, etc. The parotid secretion in such cases becomes turbid, and from time to time the ducts are blocked by small blobs of muco-pus and epithelial cells. A few of the cases, particularly those in which the parotid swellings appear and disappear very rapidly, have been considered as possibly allergic in origin, but a bacterial infection is usually present. Between the attacks the anterior border of the parotid is often much more easily palpable over the masseter muscle than in normal patients. The most useful investigation is the

catheterization of the parotid duct, preferably whilst the gland is swollen. For this a fine glass cannula and bulb are necessary. In the typical *Str. viridans* cases the saliva is turbid due to large numbers of minute blobs of muco-pus. Direct examination of these blobs shows pus cells and columnar and pavement epithelial cells, often with intracellular organisms. In pneumococcal cases the saliva is usually more uniformly turbid. Cultures should also be made of fluid obtained by catheterization. Further information may also be gained by taking a sialogram after the injection of lipiodol into the duct system. In the individual case treatment must be based on the information obtained from these investigations. Suppurative complications do not occur in the *Str. viridans* group, but subacute and loculated abscesses may develop in connexion with pneumococcal infection.

#### Registration of Maternity Homes

**Q.**—A widow, having some experience of maternity but no qualifications, and a spare room in a well-equipped and well-run house, has for the last two years been taking in maternity cases, mainly the wives of absent soldiers who have difficulty in finding domestic help to enable them to have their babies at home. Confinements, ante-natal and after-care have been carried out by a district midwife and doctor. She has now been informed by a representative of the county medical officer that she may not continue to do this as hers is not registered as a nursing home, and cannot be so registered without a resident qualified midwife. She is, however, at liberty to go to the homes of mothers to look after the domestic side of confinements. This she cannot do, as she has some family of her own to look after. I shall be glad of an opinion on the legal side of this problem.

**A.**—The lady has obviously been keeping a nursing home within the meaning of the Public Health Act, 1936, ss. 187-95. A nursing home includes a maternity home, which means any premises used or intended to be used for the reception of pregnant women or of women immediately after childbirth. The Act makes the M.O.H. of the county or county borough primarily responsible for seeing that the nursing homes of his area comply with its provisions. The control of such activities as the question describes may seem vexatious in such a case, but it is clearly necessary in order to check wholesale abuses such as baby-farming and criminal abortion. A nursing home is therefore illegal unless it is registered with the local authority, who may refuse registration for various reasons, among which is failure to provide a properly qualified superintendent and staff. Section 187 lays down explicitly that the nursing in a maternity home must be superintended by a qualified nurse or a certified midwife. On the other hand, although the Act says that a nursing home other than a maternity home must have a resident medical practitioner or qualified nurse, it does not impose this requirement on maternity homes. If, therefore, the sole objection of the local authority to registering this lady's house is that she has no resident qualified midwife, the authority appears to be exceeding the powers of refusal given it by the Act. Her proper procedure, if she cannot get the M.O.H. to agree with this view of the law, is to apply for registration. If the authority desires to refuse, it must give her a clear fortnight's notice in writing, with its grounds of refusal. If then she writes within a fortnight and asks for an opportunity for showing cause against the refusal, the council must give her one. If it then refuses, she is entitled to a free copy of the order, and she may appeal against it to a court of summary jurisdiction—the local bench of magistrates. The order must inform her of this right. If the bench takes the view that the council is exceeding its powers, it may order the council to license her. She should not admit any more mothers until she obtains her licence.

#### What is a Vaccine?

**Q.**—(1) What is a vaccine? (2) What is a non-bacterial vaccine? Does a mixed inhalant solution composed of dusts and pollens, etc., and used in desensitizing an asthmatic come under the latter category?

**A.**—By derivation the word vaccine means something obtained from a calf, and for many years vaccination meant nothing else than the process of immunization against smallpox by inoculation with the virus of vaccinia obtained from lesions in that animal. With the advent of other methods of immunization the same terms were also unfortunately used for other materials and proceedings, and a definition of the word vaccine which would be generally accepted now is "a suspension of killed or attenuated micro-organisms used for immunization." Whether the meaning of the term should be extended still further to embrace agents of non-microbic origin used for purposes of immunization or desensitization is perhaps a matter of opinion, but respect for the long-accepted meanings of words condemns such usage, and the answer to the first clause of the second question is that there is no such thing. A pollen extract remains a pollen extract whatever may be done with it, and there is no good scientific reason for calling it anything else. If a general term is wanted to cover agents of this nature, another much-abused word, "antigen," may correctly be applied to them.

## Flatulence and Fluids

**Q.**—In the case of cardiac affections we are taught that high solids form the best diet because fluid food is likely to cause flatulence. This would seem to exclude soups. Upon what physiological or pathological grounds do we base our view that fluid foods—e.g., soups—cause flatulence? If soups cause flatulence, is it osmotic flatulence or intestinal flatulence?

**A.**—There is not the slightest evidence to support the tradition that fluids cause either gastric or intestinal flatulence. The excess of gas present in the alimentary tract in heart failure, cirrhosis of the liver, and chronic bronchitis is caused by deficient absorption the result of venous congestion. Possibly some gas even passes from the blood into the lumen of the stomach and intestines. Dietetic restrictions have little effect, but it is worth while reducing the intakes of potatoes, other root vegetables, and rice, though this does not lead to anything approaching the relief it gives to the colonic distension of intestinal carbohydrate dyspepsia. Diastatic ferments are useless; a tablespoonful of powdered charcoal taken twice a day may help a little; but the only effective treatment is relief of the venous congestion by treatment of the primary condition. If the flatulent distension causes pain and the patient is constipated, complete evacuation of both faeces and gas from the colon can be obtained within a few minutes by the injection of 1-2 c.c.m. or less of pitresin if this is not contraindicated by the condition of the heart.

## Unexplained Exhaustion in Women

**Q.**—A few of my women patients, though not anaemic, have a poor reserve of strength. Their diet and environment are satisfactory, and they have never had serious disease, yet a small walk exhausts them, and they are as tired on waking as on bedtime. Physical examination gives no clue.

**A.**—Cases of this kind are not uncommon and they tend to be treated for intestinal toxæmia, focal sepsis, hormone deficiency, or avitaminosis according to the prevailing fashion or the date of graduation of the therapist. The tendency nowadays is to regard them as cases of depression, but the early onset, the trivial psychological strain, the absence of remissions, and the small success of psychotherapy make this explanation a little doubtful. Nevertheless encouragement and an interesting occupation are important elements of treatment. Small doses of benzedrine (amphetamine), 5 mg. at breakfast and midday, may also be tried.

## Gold Treatment of Rheumatoid Arthritis

**Q.**—A woman aged 54 years had rheumatic fever with endocarditis 20 years ago and made a good recovery. In the past 10 years she has developed rheumatoid arthritis, especially in the interphalangeal joints of the fingers, and there is definite rheumatoid arthritis of the knees. Would "gold" treatment of this condition be beneficial, and in what doses and how would I administer it? The pain is not excessive, but the condition is progressive and threatens to be crippling.

**A.**—It is not uncommon to meet with a history of rheumatic fever in earlier life in cases of rheumatoid arthritis. In the case under consideration gold would appear to be well worthy of a trial, but a warning is necessary against its use without previous experience as the risks are real, and sometimes, in spite of close observation, unfavourable effects arise. A thorough blood investigation should be carried out for anaemia and sedimentation rate; the former, if present, will call for attention first, possibly by administering liver at the same time as the gold is given, and iron in any case. It is wise to begin with a dose of 0.01 g. if myocristin is the preparation selected, and to increase gradually to 0.05, giving this at weekly intervals up to a total not exceeding 1 g. A careful watch for any signs of irritation of the skin or soreness of the mouth must be kept; the urine should be examined at frequent intervals and blood counts carried out; any decrease in the white cells may be a danger sign, and a lowered platelet count may be warning of possible haemorrhages, though these are one of the rarer complications. The wisest plan is for the patient to have the earlier stages of the treatment carried out in hospital or wherever skilled observation may be available. The method is fully described in the more recently published books on arthritis.

## Solphonamides and Rheumatic Fever

**Q.**—I understand that sulphonamides have been used in the prophylaxis of rheumatic fever. Could they be used in the treatment of subacute rheumatic fever, and if so, in what dose, say, should sulphanilamide be given and over how long a period?

**A.**—Sulphanilamide has been used during the winter months to prevent recurrent attacks of rheumatic fever. It is difficult to see how its value in this respect can be assessed under a period of many years. If it is effective it probably owes its efficacy to the prevention of the streptococcal tonsillitis which often precedes the reactivation

of the agent responsible for rheumatic fever. There is no evidence that sulphonamides are of value in the treatment of subacute rheumatic fever.

## Mercurial Poisoning

**Q.**—Is there any likelihood of mercurial poisoning from prolonged use of mersalyl or salyrgan? A patient aged about 56 has a high systolic blood pressure and failing right ventricle, with consequent dropsy and oliguria. He has been having daily doses of 2 c.c.m. for some time.

**A.**—Mercurial poisoning is very unlikely to result from the prolonged use of mersalyl or salyrgan. Thus a case was recorded in this Journal by C. M. McIntyre (1943, 2, 609) in which 680 injections had been given over a period of about 6 years with only occasional slight reactions which could be ascribed to mercury. Mercurial reactions, however, may occur. N. M. Keith (*J. Amer. med. Ass.*, 1936, 107, 2047) says: "The distressing reactions that have actually been seen after the injection of organic mercury are stomatitis, diffuse dermatitis, diarrhoea, haematuria, and renal insufficiency. Luckily, these reactions are rare." It is a wise precaution to see that there is no oral sepsis in any case in which prolonged administration is contemplated. Cramps may occur in the legs due to deprivation of sodium chloride, and these are relieved by adding salt to the diet. In other cases the patient complains of feeling ill and tired after the injections. This is probably due to excessive dehydration, and disappears when the injections are given less often. In the case referred to here it might be advisable to try giving the injections at five-day intervals, judging the effect by the excretion of urine and weight of the patient. If this is not successful the administration of ammonium chloride by mouth, in doses of 30 grains four times a day for three days before the injection and on the day of the injection, may give satisfactory results with only one injection a week. Sudden toxic reactions are rare. They include such symptoms as headache, unconsciousness, and epileptiform convulsions, as was reported by C. T. Andrews in this Journal (1942, 1, 24) in a case of heart failure in which kidney disease was excluded.

## INCOME TAX

## Cost of Air-raid Shelter

"Jay" expended £80 in building and equipping an air-raid shelter attached to the surgery of an industrial practice. He is informed that no allowance can be made on that account for income-tax purposes as the shelter was erected in connexion with a professional and not a "trade" concern.

\* That is correct. The underlying reason is that the special arrangements made to encourage the erection of shelters were intended for the benefit of employees, and therefore apply to factories, mines, and buildings used for commercial purposes, but not where the premises are put to professional use.

## Pension from Abroad

C. M., who is now residing and practising in this country, is in receipt of a small pension derived from service abroad with a foreign shipping concern. Is he liable to pay British tax on the pension?

\* Yes; British residents are liable in respect of such incomes even though earned by foreign service.

## "Pay as you Earn"

## Earnings Assessed under Schedule D

M. Ls.' husband is a specialist; for the past eighteen months she has been assisting in a general practice, and her earnings have been included, for income-tax assessment, in one sum with those of her husband. Can she claim to come under the new system?

\* "Pay as you earn" applies only to earnings assessed under Schedule E. M. Ls.' earnings should not strictly have been assessed under Schedule D, because she is in employment and is not in general practice. The only way in which the benefit of cancellation of 7/12ths of the 1943-4 tax can be obtained is for M. L. to arrange with the inspector of taxes for the Schedule D assessment on her husband to be reduced by the exclusion of her earnings, and for Schedule E assessment to be made on them specifically.

## Salaries paid to Partners

W. W. inquires whether there is any method by which a partnership may take advantage of this new system as regards "salaries" paid to partners.

\* No. The Income Tax Acts regard payment of such "salaries" as really an arrangement for the distribution of profits between the partners. The "salaries" are not deductible in arriving at the amount of the Schedule D assessment, are not assessable under Schedule E, and accordingly do not come within the new "pay-as-you-earn" system.

## LETTERS, NOTES, ETC.

## Thiouracil: A Warning

Dr. DAVID HALER (London, W.1) writes: In your reply to a question on the above subject (Feb. 26, p. 313) you state that no other toxic effects apart from a skin rash have been described. This is not a fact. Thiouracil is a dangerous drug, and at least half a dozen fatal cases of agranulocytosis have been described following its use, and only this week I conducted a necropsy upon such a case, the inquest resulting in a verdict of misadventure following the administration of thiouracil. In my opinion this drug should be given only under the strictest in-patient control, when full pathological and clinical facilities are available for full control of the case. I feel it to be of sufficient importance for you to give this warning adequate publicity.

## Ephedrine and Argylol in Normal Saline

Messrs. E. W. BASTOW and T. D. WHITET (pharmacists, Charing Cross Hospital) write: Following the letter of Dr. A. Piney (Jan. 29, p. 163), we have prepared solutions containing ephedrine and argylol in normal saline without any difficulty, and we are surprised there has been trouble in the preparation of a satisfactory solution. A solution made with argylol (Barnes) is indistinguishable from the proprietary article, and shows no precipitate after over a week, being bright and clear. A second solution prepared with argent. vitellin B.P.C. also appears quite stable after several days, and although not quite so bright as the first solution, it has no sign of a precipitate. The most satisfactory method of preparation is as follows. Dissolve the amount of argylol in about half of the water required and the salt and ephedrine hydrochloride in another portion, mix the two solutions, and dilute to volume. The finished solution should be stored in a dark bottle. It is proposed to investigate this matter further, and submit a short paper to the *Pharmaceutical Journal*.

## Paul-Bunnell Test

Dr. F. DURAN-JORDA (Manchester) writes: I notice that in the *Journal* of Dec. 11 (p. 771) there is a reply to a question concerning the Paul-Bunnell test for infectious mononucleosis. In the first paragraph of the reply there is a short description of the method, in which the reader is given to understand that by mixing the serum with a 2% suspension of sheep blood cells an agglutination is produced in small dilutions in any kind of serum, normal or abnormal. I have not seen any further correspondence on this subject which may have rectified the description, but I should like to point out that the serum should first be inactivated, because the mixing of fresh human serum with sheep blood cells produces haemolysis instead of agglutination, due to the fact that in the human serum there is normally an antihæmolytic factor against the sheep cells which acts when the normal-serum content of the complement has not been destroyed by heating.

## Structure of Atropine

Dr. J. N. DAVIDSON and Dr. I. C. WHITFIELD (Aberdeen University) write: The similarity between pethidine and atropine as indicated in the paper by Drs. Gallen and Prescott (Feb. 5, p. 176) would be less marked if the structure of atropine were correctly presented. The formula shown is an ester of a tropane carboxylic acid, whereas atropine is, of course, the *dl*-tropic acid ester of tropine.

## Photomicrography with Ordinary Cameras

Mr O. L. WADE writes from Cardiff: I read with interest the article on this subject. Some of your readers might be interested to know that very effective cine-photos of microscopical preparations can quite easily be taken. In pre-war days I made a successful film of hydra and daphnia and other small pond life using a  $\times 6$  eyepiece and a 1/6-in. and a 1/3-in. objective. The light was a carbon arc lamp run off the house mains. The microscope tube was placed horizontally on a specially made holder. The preparation was clipped to the microscope stage, and to protect it from the heat of the lamp the light was passed through a glass jar of copper sulphate solution. The camera, in this case a 9-mm. Pathé, was applied to the eyepiece of the microscope: its casing was opened and the microscope focus adjusted until a sharp image fell on a piece of cardboard placed where the film lies during exposure. A little experimentation, exposing and developing only small sections of film, enables the optimum conditions to be found. We suffered great difficulty as we did not possess a two-way prism eyepiece, and were unable to view the field while exposing film. To ensure that the animals did not pass out of the microscope field we made a small cell 1 cm. by 1 cm. by 1/10 cm. on a microscope slide and pushed in a few strands of cotton-wool. This divided up the cell into small compartments and prevented the animals swimming outside the microscope field. The difficulty with very high-power work, 1/6 in. or 1/12 in., is to make the living cells show up against the bright light. I am hoping to have success in photographing phagocytic cells stained by Maximow's supravital stains (Sabin, Doan, and

Cunningham, *Contributions to Embryology*, 1925, Nos. 82, 83, 84). I think it would also be possible to photograph living preparations as made by Covell (*Anatomical Record*, 1928, 40), where the cells are excreting granules stained by dyestuffs injected intravenously.

## Pin-hole Urinary Meatus

Mr. FAUSET WELSH, F.R.C.S. (Birmingham), writes: In your issue of Feb. 26 (p. 314) a questioner describes under the term "pin-hole meatus" a condition which I recognize as meatal ulcer. The answer given does not satisfy me, nor will it satisfy anybody who has to treat this troublesome little complaint. In the first place there is little doubt that the pin-hole meatus is caused by the meatal ulcer and not vice versa. The smallest meatus which we ever see in a child is the one found in hypospadias, but we never see spontaneous ulceration here. Again, ulceration of the meatus is not found in the uncircumcised child. It is very common after circumcision, though an interval of three months to eighteen months may elapse between the operation and the onset of ulcer symptoms. Lack of the protection normally given by the prepuce is responsible for ulceration at the lips of the meatus. Friction by the clothing or ammoniacal dermatitis are probably the other factors setting up the ulcer. A scab forms across the meatus and the child can urinate only by bursting this scab, a process accompanied by pain and the appearance of a few spots of bright blood. The scab then re-forms and the process is repeated. The ulcer will heal if, after micturition, a small square of lint smeared with a blob of medicament, such as ung. H.A.D., is placed over the meatus. Healing is sometimes accompanied by stenosis, and if the meatus is unusually small a meatotomy will be required. This is a very delicate operation.

## Abdominal Injury and Intussusception

Mr. A. S. ALDIS, F.R.C.S. (senior assistant, Surgical Unit, Welsh National School of Medicine, the Royal Infirmary, Cardiff) writes: May I have the hospitality of your columns to seek information in connexion with a somewhat unusual case which has just come under our care? The patient is a boy aged 9 who was run over by a milk van, the wheel passing across his abdomen. There was little external sign of injury and the boy's condition was so good, with no abdominal rigidity, that operation was deferred. Twelve hours later the patient started to vomit and there was some visible peristalsis in the upper abdomen together with tenderness and a rising pulse rate. A laparotomy was performed and the boy was found to have a small rupture of the liver and some bruising of the pancreas. In a routine investigation of the other viscera he was also found to have an entero-enteric intussusception about three inches long near the junction of the jejunum and ileum. The small intestine above the intussusception was dilated, and below was it spasm. No other injury was found in the abdomen, the intussusception was easily reduced, and no abnormality of the bowel or hæmatoma of its wall was discovered to account for its occurrence. I would be most interested to know whether any readers have seen a similar association of abdominal injury and intussusception. It seems to me to be a true example of enterospasm initiating an intussusception.

## Rare Medical Books

Dr. M. G. BASTABLE (Stranraer, Co. Donegal) writes: Under the heading "Rare Medical Books" (Jan. 22, p. 138) you mention some rarities now to be sold, among them being Moore's *Hope of Health* (London, 1564) and other similar manuscripts. Some of your readers may be interested to know that the Government Publication Department in this country has a team of scholars working on unpublished Irish texts, some of which have already been reprinted at a very moderate price. The most recent of these is the *Regimen Sanitatis Magistri Mediolanensis*, containing both the Latin version and the Gaelic translation. In a scholarly introduction (in English) the editor says: "The large body of mediæval Latin medical work has generally an interest only for the specialist in the history of medicine, while early translations of such texts into the several European vernaculars have mainly interested lexicographers. If this fourteenth century *Regimen Sanitatis* of Maginus, a doctor of Milan, were to make further claim it would be on the student of the social history of the period; a rule for the preservation of health; it has necessarily a broader compass than works on the treatment of specific disease or conditions. . . . Early translations of such texts into the vernacular may be of importance in establishing a critical Latin text, and in this connexion it might be noted that the earlier of the two extant Irish MSS. of the *Regimen* (P, dated 1469), though not the original translation, is earlier than any printed edition; indeed very little over a hundred years, and very possibly less, may have elapsed between the writing of the *Regimen* and its translation into Irish." For the Latin text the editor has used two printed editions in Trinity College, Dublin: "The earlier version (J) was printed in Paris by Felix Bagault for Claude Jaumar and Thomas Julian; the editor is undated but is treated by bibliophiles as an 'incunabulum' and given the approximate date 1500." (*Regimen na Slainte*, etc., 2 vols., editor, James Carney; publishers, Irish Government Publications, 3-4, College Street, Dublin.)

# BRITISH MEDICAL JOURNAL

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## HYGIENE ASPECTS OF THE EL ALAMEIN VICTORY, 1942

BY

H. S. GEAR, M.D., D.P.H.

*Lieut.-Col., South African Medical Corps; Assistant Director of Hygiene, Middle East Forces*

The hygiene story of the El Alamein victory has its logical beginning in the misfortunes experienced during the retreat of the Eighth Army from Gazala in June, 1942. Though this retreat was, in an operational sense, always under control, it created an unhappy series of circumstances for the Army hygiene authorities. First, the inevitable confusion among formations and units moving back to the El Alamein line led to decrease of supervision by hygiene officers and sections, and an understandable slackening of unit and personal standards of hygiene and sanitation. Units became dispersed; there was no time to establish control of camping sites; equipment was lost, sanitary discipline relaxed, and much ground became badly fouled. Secondly, apart from the disturbance the retreat caused in the hygiene organization, it created a new problem by sweeping back hordes of natives, Bedouins, and others, to settle in an uncontrolled mass in the rear of the El Alamein line. These natives, normally lacking any high sanitary instincts, became a serious menace to the Army, and drastic action had eventually to be taken to have them removed to harmless areas further back still. Thirdly, contributing to the problem on the eve of and during the El Alamein battle was the inclusion in the Eighth Army of formations fresh from over-seas and lacking that full respect for the question of insanitation and tropical ill-health which is gained only by experience in warm climates. These formations were also "unsalted," and hence suffered more from such complaints as "gypsy tummy" and sandfly fever than the older hoods. Fourthly, the retreat, the period of preparation, and the actual battle covered the late summer and autumn seasons, when many Egyptian health hazards are at their worst. Flies became a serious plague, necessitating special control measures. Sandflies took their toll in several base camps. The heat and dust were an added irritation, especially to new-comers.

This vast problem of hygiene was methodically tackled from the halt at El Alamein until the advance at the end of Oct., 1942. The hygiene organization was entirely reviewed and several major changes were made; the fly nuisance with its danger of spreading excremental disease was met by a special unit, the special new problems of Armoured Fighting Vehicles were gone into, and the very important problem of Army feeding was examined afresh and new ration scales and methods of cooking devised. Preparations were made for dealing with prisoners of war, who almost certainly would be lousy, and for cleaning up captured enemy areas and towns.

Once active operations had started there was little of interest concerning hygiene until the enemy broke early in November. Then the anticipated problems arose in captured territory—cleaning up fouled areas, purifying water supplies, defousing prisoners of war, and pushing forward apparatus to ensure

the cleanliness of our troops. The last-named was necessary, because typhus fever had to be borne in mind as a hazard if our troops became lousy. Hygiene officers were included in each of the new area administrations, and without delay they organized the necessary measures.

The various aspects of the work undertaken during the preliminary and operational phases of the El Alamein battle will now be discussed in detail.

### Hygiene Organization

Previous experience in the Western Desert had shown that the old hygiene organization was too rigid. Field hygiene sections were on a strict divisional and lines-of-communication basis. With the mobility of desert warfare such sections could not cope with the dispersion and changing constitution of formations, and smaller groups often had no field hygiene section assistance. Then the old defects in the method of recruiting and using unit water and sanitary duty personnel were again exposed. To overcome these defects and to meet the mobility and the kaleidoscopic conditions of desert warfare such as the Eighth Army anticipated in its projected advance, certain improvised reorganization of hygiene sections and personnel was undertaken. The principle governing this reorganization was that field hygiene sections would not rigidly adhere to their divisions, but would be held in corps and Army pools, for employment according to the needs of the situation. Its application to the Eighth Army for the battle period was made on the plan that the corps which carried out the initial assault would not follow up in the event of success but would make way for a second pursuing corps. Corps groups of three field hygiene sections each were accordingly formed. In the case of the pursuit corps, the officers commanding and detachments of the sections were allotted to brigades.

The scheme produced some excellent results; sanitary assistants were where they were required, and the workshops produced a steady flow of apparatus to supply troops moving forward into new areas. It was possible to send forward hygiene teams with stores and apparatus to captured areas, such as Mersa Matruh and Capuzzo, long before any permanent unit was available. One difficulty that arose was that the rapid changes in the composition of formations resulted in some sanitary assistants becoming completely divorced from their parent units. Unit personnel were improved by insistence on more care being given to their selection, and putting a responsibility on O.S.C. and R.M.O.s. to prevent sanitary and water-duty personnel being recruited from the useless misfits of the unit.

With the advance it was necessary to make arrangements for the sanitation of all captured areas used as lines of communication or bases. One field hygiene section carried out excellent work in depositing hygiene stores in such areas. With the establishment of sub-areas, three field hygiene sections were detailed to supervise their hygiene and sanitary restoration; two sections were allotted to Tobruk and Derna, and one field hygiene section to Benghazi.

Each new sub-area organization was provided also with a D.A.D.H., while a close liaison was built up with the Occupied Enemy Territory Administration medical organization responsible for the civilian medical services in Cyrenaica.

The bad sanitary conditions at El Alamein referred to above produced an appalling plague of flies. The emergency was quite beyond the power of the ordinary hygiene organization, so a special Fly Control Unit was created. This unit consisted of five officers and some 200 or 300 British other ranks and African pioneers, with several British N.C.O.s to act as supervisors. It was given a rapid course in fly-control methods and then sent to clean the El Alamein area of fly-breeding sources. Its work was thorough and efficacious, extending even to "no man's land," where corpses and other organic matter made one of the worst fly-breeding sources. In co-operation with field hygiene sections and unit personnel, it moved from area to area, clearing unit lines of refuse, debris, and bodies. As a measure to meet an unusual and serious emergency this temporary unit more than justified its creation.

#### Sanitation

The serious sanitary situation from July to September has been referred to above. Its particular causes lay in the general fouling of the whole El Alamein line and the areas in its rear. Vigorous action by field hygiene sections, unit personnel, and the special Fly Control Unit cleared up the region considerably, and fortunately prevented any serious outbreak of disease.

This experience demonstrated that the burial of refuse from unit lines was usually inefficiently done and contributed to the breeding of flies. Eventually incineration was accepted as the simplest and most practical method of rendering refuse innocuous. The simple oil-drum incinerator, easily improvised in the field, was most generally used. The food tin—the dominant feature of desert rations—became a menace. It was rarely emptied completely, and thus, besides increasing waste when discarded, became an annoying and difficult refuse problem. Emphatic instructions and persistent education to improve unit methods were adopted, and units gradually became more careful in clearing tins completely, burning them out, and disposing of them systematically. As will be discussed below, the return to company cooking assisted in the improvement of these conditions.

Latrines were not as troublesome a problem as might be thought. In many places the more stable camp communities were able to use deep pit latrines, though generally the rocky nature of the subsoil made deep excavations impossible. Here the petrol-tin latrine was efficacious. Daily burning reduced the dejecta to an innocuous dried mass. A simple squatting type of two-scat latrine superstructure was produced to provide the troops with at least some means of constructing field latrines. Though easily portable, being only just over 60 lb. in weight, it was a failure. With the limited transport available in the desert, units would not carry even the simplest latrine structure. Units met their latrine needs by improvisation of single seats from the ubiquitous petrol box and tin.

Waste water from field units in desert areas did not cause difficulty, partly because the water ration was so low that no large accumulations could occur, and also because the absorptive and evaporative capacity of the desert is so large.

Reference was made above to the cleaning up of captured areas. This was an immense task, as the enemy had left his fortresses, camps, and ports in an indescribably filthy condition. Previous acquaintance with enemy standards of hygiene and sanitation had shown how low they were. However, it was the advance from El Alamein which brought to light the full weakness of German and Italian hygiene organization. The enemy lines and camps at El Alamein and the bases at Matruh, Tobruk, Derna, and Benghazi were revolting in the masses of human faeces and camp debris lying everywhere. One of our hygiene officers charged with the distasteful task of supervising the clearance of the previously enemy-occupied El Alamein area reported:

"That portion of the battlefield previously occupied by the enemy is just one huge fly farm, and has to be seen to be believed. Whilst both Germans and Italians order the use of shallow trench latrines (and no oil seal), this order is scarcely ever carried out. Enemy

defensive localities are obvious from the amount of faeces lying on the surface of the ground."

The enemy paid for his contempt of hygiene, as these insanitary conditions had the inevitable result of causing a heavy incidence of excremental disease. This became such a menace to the enemy as to affect from 40 to 50% of his front-line troops, as interrogation of captured medical officers revealed. To quote one of our hygiene reports:

"It has, however, been heartening to observe the difference between the enemy sanitation and dysentery/diarrhoea rate and our own. The enemy appears to have no conception of the most elementary measures, and has a dysentery/diarrhoea rate so very much higher than ours that it is believed that the poor physical condition of his troops played a great part in the recent victory at El Alamein."

#### Rations and Feeding Problems

Previous desert operations had caused some medical anxiety over the retention of troops for long periods on a battle ration designed for one week only. This unnecessarily prolonged use of battle rations was on occasion unavoidable when troops became isolated or when lines of communication were seriously interfered with. However, it is to be regretted that in the early campaigns the danger of a low-calorie and dry ration was not always fully appreciated by some local formation supply authorities.

An attempt was made, for the El Alamein plan, to evolve a battle ration—i.e., a minimum ration of low weight and readily prepared items—which need not be limited to seven or ten days only. This ration, with 3,600 calories, adequate vitamin A, B series, and C values, composed of items available in the Middle East and not too difficult to prepare in the absence of water and cooking facilities, was rejected as being beyond the weight limits permissible by available transport. Eventually a new battle ration of approximately 3,100 calories per man per day was evolved, with the strict condition of use for not more than an absolute maximum period of ten days. It was a great advance on the old battle ration in providing variety, including such items as sausages, cheese, jam, onions, and tinned fish. Medical concern that the period of ten days should not be exceeded was fully appreciated by the "Q" authorities. The result was that throughout the October and November operations the battle ration was limited to essential occasions—in fact, only a few troops were forced to use it, and then merely for a few days at a time—a testimony to the very efficient supply arrangements of the Eighth Army.

For the rest—i.e., for most of the advance—the Eighth Army existed on the Middle East field service ration (hard) scale. This, in terms of the General Order, is the normal scale of rations, but with tinned or "hard" items substituted for fresh equivalents—e.g., tinned vegetables instead of fresh vegetables, biscuits instead of flour, etc. To prepare meals from hard-scale rations requires only the provision of boiling water. This scale was constructed under the general limiting factors operative in the Middle East—i.e., the availability of local supplies, the need to use imported and tinned items sparingly, and the limited amount of water provided for cooking in the desert. However, a satisfactory scale was produced with an average calorie value of 3,800 and the following average vitamin values: A, 2,500–3,000 i.u.; B<sub>1</sub>, 350–450 i.u.; B<sub>2</sub>, 1.3 mg.; nicotinic acid, 22–25 mg.; C, 15 mg. Yeast tablets and ascorbic acid tablets were of course available for issue on medical recommendation.

In spite of the exceedingly difficult problems of supply arising out of the rapid advance, it was not even necessary to maintain the Army on the hard scale for long periods. In a very short time after occupation, for example, field bakeries were operating in Tobruk and Benghazi and sending forward fresh bread, while consignments of frozen meat were also shipped to these ports. Fresh vegetables and oranges were supplied as opportunity allowed; but obviously, being more perishable, these could not reach as far forward as bread and meat supplies.

The construction and supply of a ration scale is only part of the procedure of feeding an army. As the Middle East campaigns have shown, however satisfactorily a well-balanced and adequate ration emerges from Details Issue Depots, much can happen to destroy its value before consumption by the troops. Apart from the time taken to train cooks in a large



ivilian army, the dispersal of units resulted in the disappearance of organized company cooking in the field. There grew up the practice of each small group, usually each vehicle crew, ending for its meals. Such vehicle or section cooking is very unsatisfactory. Well-cooked complete meals, at regular intervals, are replaced by casual feeding out of a tin. This results in waste of rations, and the debris from cooking and feeding is scattered far and wide over camping areas. A corollary to this problem arose in the case of A.F.V.s. Fighting all day, leaguered in strict black-out conditions at night too tired to look after themselves, the crews of tanks and armoured cars were too often unable to get more than an occasional bite of a biscuit. To counter these unsatisfactory methods, company cooking was reintroduced, and, except in actual highly mobile phases, most units used it during operations. For armoured units, a mobile cooking lorry was evolved by fitting a No. 2 petrol cooker and food-containers to a three-ton lorry. This simple improvised vehicle carried hot meals forward to the fighting crews and, in general, proved most valuable during the El Alamein operations.

A further special ration problem which received some attention prior to the operations was the provision of a pack ration for A.F.V.s. Tanks and armoured cars have to face occasional periods of isolation. They must be self-contained to meet such emergencies, and the provision of food, including liquids, led to the trial of the packs produced in the United Kingdom of two-men and three-men one-day rations and, on a smaller scale, of an American pack ration. In addition, most A.F.V.s were supplied with special half-gallon vacuum-flasks for hot drinks. This was a valuable measure. However, experience under desert conditions suggests that pack rations have a limited value for A.F.V.s.

Generally, the operations showed that continuous training and propaganda are necessary to ensure that all units are provided with good cooks, proper company cooking arrangements, and a fully developed sense of cookhouse hygiene and sanitation. The work being done by the Catering Advisers to the Army is going a long way to achieving the necessary improvements in the shortest possible time.

#### Water Supplies

In the initial stages of the operations the water supply was almost entirely from points on pipe-lines originating in Alexandria. This reticular system, branching out into the desert, equipped with booster pumping stations, and carrying purified water to distances of 50 miles and to within a few miles of the front line, was a triumph of the Army water engineers. It carried chlorinated water to forward units, and at least one gallon a day per man was provided in the preparatory phase during September and October.

The advance required early inspection, and usually repair and clearance, of captured water points. Hygiene personnel assisted the engineers in this duty. The majority of wells and birs had been both damaged and polluted by the enemy. The methods of pollution used were those seen in previous desert campaigns—namely, introduction of diesel oil, bone-oil, dead bodies, and filth of any kind. The destruction and pollution rarely held up our units long. Pumps were repaired or replaced and wells were vigorously pumped clear, with the addition, where necessary, of water-sterilizing powder to neutralize contamination. Hygiene personnel undertook the necessary water analysis and supervised water purification, using the standard methods of superchlorination with bleaching powder and "de-tasting" with sodium thiosulphate.

The advance carried troops considerable distances ahead of water points, and transport of water became difficult. This led to the daily ration being reduced to half a gallon for certain periods. For this purpose a variety of containers were used, the commonest being a two-gallon tin, tens of thousands of which were filled and transported by the supply organization. The most popular vessel was the captured two-gallon container—the "jerrican"—a stout metal receptacle with a good screw cap. The majority of units soon equipped themselves with these. The geology of the desert right up to Agheila, in the Gulf of Sirte, was known, so that the problems associated with saline wells were not new. Certain of these wells had to be used; in some a salinity of over 300 parts per 100,000 was

tolerated by the troops without serious results. The efficiency of the water supply was shown by the absence of any water-borne disease during the months of the attack and the advance.

#### Disease Incidence

The index of the health of the Eighth Army for the period is given by the admissions to C.C.S.s and Field Ambulances (Table I):

TABLE I.—Admissions to C.C.S.s and Field Ambulances

1942	Sick	Battle Casualties	Daily Rate of Admission per 1,000 Strength
Sept. ..	10,417	1,470	1.96
Oct. ..	11,144	7,634	1.67
Nov. ..	8,698	3,602	1.59

This table shows the excellent health of the Eighth Army in the prelude and in the actual battle. A daily admission rate below 2 per 1,000 was not only satisfactory, it was remarkable. A further feature to note is that, even in the acute battle period, admissions due to battle casualties still remained considerably less numerous than those due to disease.

The commoner causes of admissions are given in Table II:

TABLE II.—Admissions to Field Medical Units

Disease	Sept.	Oct.	Nov.
Dysentery/diarrhoea ..	1,793	1,391	1,293
Pyrexia not yet diagnosed ..	1,073	847	591
Digestive ..	933	816	517
Inflammation of areolar and skin tissue ..	927	944	622
Accidental injuries ..	858	825	736
Infective hepatitis ..	449	1,438	1,861

This table shows clearly that, in spite of modern Army hygiene progress, much preventable sickness still occurs. Dysentery/diarrhoea, inflammation of the areolar tissue, and accidental injuries, among the commonest causes of disease in the desert campaign, are still too prevalent in our armies.

Certain conditions deserve a few paragraphs of mention:

**Typhus Fever.**—Typhus does not appear in the above list of diseases; nevertheless much thought and work were given to this disease. It is endemic in many parts of the Middle East, and all the circumstances seemed set for it to become epidemic—e.g., social disorganization, spread of lousiness in civilian and, to a lesser extent, in some Army populations, etc. Adequate precautions to meet lousiness during the campaign—possible in our own troops, certain in the enemy—had therefore to be taken. Mobile disinfecting and cleansing teams were trained and pools of disinfecting apparatus and stores were created. Vaccination could not be made general owing to the then shortage of supplies.

As the Army advanced it was strongly recommended that mobile bath units and, if possible, laundries should follow. Troops were thus able to bathe occasionally, and keep their clothing clean. The organization to deal with prisoners of war had heavy work in delousing them, as infestation was high. The various measures to keep troops and prisoners of war clean and louse-free were successful, and hence typhus did not menace either our forces or our labour personnel.

**Infective Hepatitis.**—This disease still baffles investigation, and the lack of knowledge of its source and mode of spread meant that no specific preventive measures were available. Its seasonal incidence (late autumn) affected the Eighth Army during the battle phase, large numbers of cases being admitted in October and November. It was most prevalent first in a New Zealand division, but subsequently caused as many cases in Australian and U.K. divisions. From Table II it is apparent how serious a cause of disability it was in the later stages of the battle. This disease is an annoying element in wartime, not because of its seriousness to the individual, but because it immobilizes large numbers in hospital for not inconsiderable periods of treatment. Every effort, both clinically and epidemiologically, was made to determine its cause and mode of spread, unfortunately without success.

**Desert Sores.**—This condition, or group of conditions, was troublesome. Its incidence, too, was highest in the desert in

autumn. The aetiology and epidemiology, as with infective hepatitis, are not definitely known. Controversy thus had free scope, and included the argument that a vitamin deficiency, especially of vitamin C, is the cause. There seems to be no justification for this extreme view, which unfortunately received much publicity. This did a certain amount of harm in producing an unjustified distrust, and even an anxiety, about the adequacy of the various Army ration scales. These scales, as discussed above, were prepared with full appreciation of the vitamin needs of the soldier. The generally accepted Middle East opinion of this condition may be stated as follows:

(a) It is a vague condition covering a whole variety of ulcerative skin lesions. (b) A minor injury is an antecedent in the majority of cases. Scratches, bruises, insect bites, etc., are the commonest injuries, and their location on exposed parts, such as forearms, hands, and knees, is thus directly parallel with the commonest sites of desert sores. (c) On occasion troops on full fresh rations have shown a high incidence, while, conversely, troops on the so-called "hard" scale have frequently been free of the affliction. There has not been any correlation, therefore, between adequacy of rations and incidence of the disease. Further, in cases of desert sore no true evidence of avitaminosis (scurvy, etc.) has been reported.

Accepting the correlation of sun, dust, dirt, flies, and minor injuries with the incidence and site distribution of so-called desert sores, protective action on general lines was planned. An attempt was made to get all troops into slacks and long-sleeved upper garments to cover the most susceptible exposed areas. Every effort was made, too, towards improving the washing facilities by pushing forward bath and laundry units, by making available simple showers, and by supplying sea-soap. Warnings and instructions to personnel and to regimental officers of the necessity for early treatment of minor cuts, bites, and bruises were issued, and the necessity for seeking medical treatment of sores was emphasized. An experiment in the use of an emollient cream on exposed parts to reduce injuries and to soften and protect the skin could not be completed owing to the operations. All in all, desert sores seemed to be relatively less in incidence, and were certainly less severe, in 1942 than in 1941.

**Dysentery/Diarrhoea.**—During the early preparatory stage, and even right into the start of the battle, these diseases caused much anxiety. As indicated above, it was a combination of seasonal changes as well as control measures which reduced the fly population, and hence the incidence of dysentery and diarrhoea. To repeat, these diseases were the result of the insanitary conditions arising out of the general fouling of the battle area of El Alamein due to the retreat and the bad disposal of waste, especially food. Though to us the excremental diseases were a bad enough problem, they became a crippling menace to the Germans and Italians owing to the absence of any hygiene control by them. Our troops, too, had the benefit of the efficient protection afforded by our T.A.B. vaccine.

**Heat and Sun Effects.**—The desert on the whole has not been intolerable on account of heat and glare. Wherever possible, troops from temperate zones have served a preliminary period of 3 to 6 weeks in relative quietness in the Canal Zone before proceeding to the Western Desert. This has proved an important process of acclimatization not only against heat and sun, but also against many of the dietetic and other irritations of an Oriental location. Unfortunately, certain reinforcements for the Eighth Army at the critical stage at El Alamein had to be pushed forward sooner than usual, and these at first felt the desert conditions to a certain extent. No cases of heat- or sun-stroke, or other effects due directly to exposure to heat or sun, have been reported. In fact, accepting modern views of the mode of action of temperature, light, and humidity on the human organism, it was decided that the bulkiness, fragility, short life, and distaste by the troops of the huge sun topee did not justify its retention for Middle East troops. Its abandonment has had no evil results. Even in tanks and armoured cars the desert heat led to no disastrous incapacitation. The high evaporative power of the desert air saved the heat-regulating mechanism of the body from any undue strain, so that as long as the tank engine, and hence the engine-ventilating system, was pumping air through the vehicles conditions were not dangerous. In the desert, therefore, there was no call for special air-conditioning devices for A.F.V.s. The

indirect effects of sun, dust, and irritation on the skin have been referred to in the discussion on desert sores.

Glare requires a short comment. The new-comer to the Middle East, alarmed by tales of the dangers of the desert sun, is usually conspicuous by the blackish sun-glasses he affects, but the older "hand" generally discards them. This indicates the Middle East policy on sun-glasses, which is that for the vast majority of individuals they are quite unnecessary under all normal conditions. In fact, such devices, by reducing the tolerance of the eye to light and by not affording it opportunities for adaptation—which quality it possesses in high degree—may actually be harmful. A wearer of dark or tinted glasses in the relatively non-glaring atmosphere of, say, Cairo, if suddenly transported to the white-sand areas of the Western Desert, will suffer intensely and be crippled in vision because his eyes have never been exercised in toleration to light. Sun-glasses have accordingly, in spite of certain demands, not been made a general issue in the Middle East, though in conditions in which glasses are both protective against dust and glare special issues have been made to limited groups of drivers, A.A. gunners, etc. No untoward damage has been reported by ophthalmologists as a result of this policy.

**Accidental Injuries.**—Accidents are as alarming a feature of modern society at war as they are during peace. This largely unnecessary drain of man-power and strain on medical facilities has occupied the attention of several branches of Army administration in the Middle East. Analysis of motor accidents, exhortations for care in handling petrol, instructions in precautions in handling explosives and mines, seem to have had only a gradual influence on the frequency and degree of accidents. Burns were the form of accident which came into prominence during the El Alamein phase. It was noteworthy that over the whole period accidental burns usually outnumbered those due to enemy action—e.g., setting tanks, etc., on fire. Petrol, of course, was the origin of most of the accidental burns seen in the Eighth Army. It is surprising how long it takes the average soldier to gain that essential healthy respect necessary in handling that extremely volatile and inflammable fluid. Lacking fuel in the form of coal or wood, fire in the desert was made with petrol for all purposes—cooking, boiling water, sterilizing apparatus, etc. There was evolved the so-called "desert stove"—a petrol tin, suitably vented, containing a small quantity of sand on which petrol was poured. Too often the inexperienced replenished this type of fire by flinging quantities of petrol on to the hot sand, with the inevitable explosion and burns. Many serious burns followed the use of petrol as an insecticide in dug-outs and other ill-ventilated premises. The lighting of a cigarette in such a heavily charged atmosphere, too, produced unfortunate results. A useful and simple safeguard against serious burns came to light in the investigation by No. 1 Medical Research Section of burns in A.F.V.s during the retreat from Gazala—viz., the great protection given by ordinary clothing. Consequently, instructions were issued that tank crews were to wear slacks to cover the knees, and sleeves down to cover the arms. Ordinary accidents should receive more and more attention from military hygiene, as they are a most serious cause of army inefficiency. It is a difficult subject, as their variety and causation are so complex, especially in a hastily trained army handling so many powerful mechanical forces and agents—explosives, volatile fluids, gases, armoured fighting vehicles, and ordinary transport.

### Summary and Conclusion

The retreat by the Eighth Army from Gazala in June, the defensive phase on the El Alamein line from July to October, and the eventual attack and victory in October and November, 1942, created the conditions and setting of serious and complex preventive medical and hygiene problems.

Questions of sanitation and the spread of excremental disease, of the prevention of typhus, desert sores, and other diseases, of the provision of adequate properly balanced rations and a pure water supply; and of dealing with the dangers of captured fouled areas—all were studied and, on the whole, successfully solved. In the opposite camp of the enemy, as captured ground and documents showed, hygiene was not energetically studied, and to-day the Italians and the Germans must regretfully realize that their neglect contributed seriously to their inability to resist our attack. A front-line force with 40 to 50% of its strength affected by dysentery and

diarrhoea can scarcely be called a vigorous army, and this was the incidence in Italian and German units.

In contrast, the Eighth Army in October and November was probably as fit mentally and physically as any army has ever been. The contribution of preventive medicine to this standard can be measured from the degree of success achieved in protecting our troops from infectious disease, in maintaining a high level of physical fitness, in ensuring adequate rations and water supply, and in adapting so far as possible the Army's clothes, fighting, and other equipment and camping conditions to accepted physiological standards. The hygiene officers and other ranks of the Eighth Army, by their enthusiastic application of modern public health principles to a heterogeneous force in a difficult environment, did good work. They—hygiene men recruited from the United Kingdom, New Zealand, South Africa, Australia, and India—may not have the glamour, glory, and excitement of their brothers in the clinical units, the field ambulances, and casualty clearing stations, of the medical services, but they have the satisfaction of knowing that the health of the Eighth Army, and hence in large measure its physical and mental capacity for forceful action, shown at El Alamein, owed much to them.

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## A STUDY OF A SELECTED GROUP OF WOMEN EMPLOYED ON EXTREMELY FINE WORK

BY

IDA MANN, D.Sc., F.R.C.S.

AND

DOROTHY ARCHIBALD

(Oxford)

The ability to perform fine work for long periods without ocular fatigue or symptoms of any kind depends on a variety of factors at present incompletely known and of the relative importance of which we have only an imperfect idea. The obvious factors to be taken into account are the individual's refraction, visual acuity, muscle balance, accommodative power, and psychological adjustment to the work. The present study was undertaken with a view to establishing what degrees of these make for success in close work, and to assess their relative importance. Most previous analyses of the condition of healthy eyes have been made on large groups of hospital or private patients, and are therefore probably not entirely representative, since the patient had himself come for examination and thus could not be regarded as entirely symptom-free. An attempt to correlate the findings in one field (convergence deficiency) between a group of private patients (unselected) and a group of R.A.F. recruits, without symptoms, has already been made,<sup>1,2</sup> with the result that the difficulties of the subject have become more apparent. The outstanding feature which emerged was the high percentage of convergence deficiency, and indeed of all phorias, in the group of 7,019 recruits who made no complaint of symptoms. In the group of 6,400 private patients with which they were compared the number complaining of symptoms associated with convergence deficiency was much higher, though the incidence of such deficiency in the whole group was actually lower (2 to 3%) than in the symptom-free recruits. It therefore seemed to us that the answer might partly lie in the kind of work done by the two groups. In the group of private patients the number who were engaged in close work was much higher than that in the recruits, and it thus appeared likely to be profitable to study the characteristics of a group doing extremely close work for long hours without symptoms. In this way one might find certain characteristics in which such a group differed from the two previously selected groups. The following study was undertaken with this end in view and, although the number examined is extremely small, the results are uniform enough to be significant.

The work was made possible by the courtesy of a leading firm of electrical engineers actively engaged in the manufacture of electric lamps. Our sincere thanks are due to them for their co-operation and assistance. The group investigated consisted of 28 women and girls between the ages of 15 and 40,

employed on what is known as "spiral inspection." This job is a suitable one for our purpose, since it demands an extremely high degree of visual concentration at an average distance of 250 mm., thus requiring accommodative effort and convergence to a greater amount than ordinary clerical work, as well as a high degree of visual acuity. The group comes into being by a process of natural selection, a number of girls being tried out on it and only those who can do it accurately without fatigue being retained. In this way the group should indicate the characteristics of persons suited to continued close work.

The work consists in sorting (by direct inspection on an illuminated green glass plate) the spiral filaments for electric-light bulbs according to their perfection, all flawed filaments being rejected. The smallest spiral dealt with has 1,400 turns to the inch. The diameter of the wire is 0.00057 in. and the separation is 0.00059 in. The girls look for two turns of the spiral in contact, for gaps, or for unevenness of pitch and of total length of the filament. This length is 60 or 100 mm., and must be accurate to 0.25 mm. A good worker will sort 10,000 filaments a day, and is actually at work 40 hours of a week of 47 hours. The average number sorted is 6,000 a day. The work begins at 7.30 a.m. At 9.30 a.m. there is a ten-minute break, at 12 noon an hour's break, and at 3 p.m. a ten-minute break. Work ends at 5 p.m. The girls do not wear any special optical appliance. They are provided with loupes magnifying about 8 diameters or less, but they use these only occasionally, when in doubt.

The degree of visual acuity involved is interesting. Using Gullstrand's constants, and calculating the size of the retinal image of the separating gap between the smallest coils (0.00014 in.) at a working distance of 250 mm., we find:

$$\text{Size of image} = \frac{1.4}{39.37} \times \frac{17.05}{250} = 0.0025 \text{ mm.}$$

Since the diameter of a foveal cone is approximately 0.002 mm. and the angle  $\theta$  usually given as  $24.14''$  it is obvious that we are working very near the limit of resolvability for the human eye. The 28 girls interrogated had been employed for periods varying between 6 months and 13 years and made no complaints of eye strain, though six said the job was rather dull and uninteresting.

The girls were tested for visual acuity on the Snellen and Jaeger types, for muscle balance (Maddox wing, Maddox rod and cover test), for stereoscopic vision, for convergence, and for voluntary convergence. They were also interrogated about their general health and their hobbies to see whether after working-hours they chose occupations involving further close work. Since we have always strongly suspected that there is a large psychological element in the production of asthenopic symptoms, one of us (D.A.) performed a group Rorschach test, using the Harrower-Erickson<sup>3</sup> multiple choice technique, with a view to estimating the psychological adjustment of these 28 workers. The Rorschach method<sup>4</sup> of personality evaluation has been in use for 20 years and has been validated by a great deal of research, carried out on normal persons, psychotics, and patients with organic nervous disease. It is in use in the Armies of most of the nations engaged in the present war. It consists in showing the subjects a set of standardized ink-blot, and recording what they see in the blots, and what features they use in them to construct the images. Until recently it remained an individual test, but a modification for rapid screening-out of maladjusted subjects has been devised in America to meet the wartime need for dealing with very large groups of individuals. The ink-blot are projected on to a screen and the subjects are presented with a series of responses and asked to mark those which best describe what they see in the blots. The responses have been chosen from the most usual ones found in the records of a thousand subjects whose psychological adjustment is known. This modification does not make detailed individual analysis of personality possible, but provides a method of rapid assortment into groups. It is undoubtedly susceptible of improvement, but it already seems to be the best test available for forming a general estimate of the emotional adjustment of groups of unknown subjects.

The Rorschach test is based on the principle that the meaning with which an individual invests a stimulus that is in itself meaningless reveals the inner organization of that indi-

vidual. If one subject sees an aeroplane, another a radiograph, a third a bear, and a fourth a man in the same ink-blot, then it is certain that something different goes on in these four individuals between the moment when the same physical stimulus reaches their retinae and the moment when they communicate their reactions. The assumption made is that these differences are meaningful and can be interpreted on Rorschach's principles.

It is claimed that the test makes it possible to estimate the "variety of an individual's psychic reactivity, the degree of his social or affective adjustment, the extent to which his inner life is integrated and constructive or disorganized by more primitive drives or undue anxiety."<sup>5</sup>

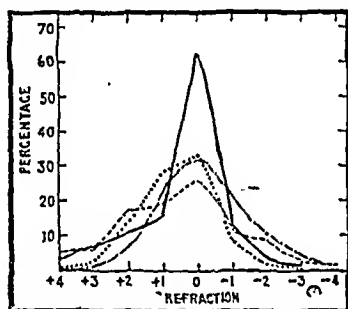
Our findings can be arranged under the following headings: age and time on present job; refraction and visual acuity; spectacles worn or not; master eye and hand; muscle balance, distance and near; presence or absence of headaches; recreations and attitude towards work; results of psychological test.

#### Age and Time on Present Job

The ages varied between 15 and 40, the average being 24 years. The shortest time on the job was six months and the longest 13½ years. The average was four years, but seven girls had been at the work for more than five years. If the girl is unsuited to the work this is discovered almost at once. Breakdowns, once the job has been mastered, do not seem to occur.

#### Refraction, Visual Acuity, and Spectacles

The refraction in each case was done without a mydriatic. The accompanying Graph shows the distribution of errors in



percentages. The high peak represents the present group; the three almost coincident lower curves are percentages taken from Wibant, Scheerer, and Brown, quoted by Dunstan.<sup>6</sup> The grades are taken at intervals of a dioptre, the refraction being reckoned as the average between the two meridians (as advocated by Edward Jackson). It will be seen at once that the group contains roughly twice as many individuals with a refraction between +1 and -1 as do the groups of other observers. A refraction approximating to emmetropia would therefore seem to be one of the factors influenced by the selection. It is not, however, the only factor. The two highest errors found were +4.5/-0.5 and -2.75/-0.75, both in girls entirely free from headaches or eye strain, but wearing their correction. The hypermetrope had a convergent strabismus in addition. In 22 of the 56 eyes refracted the error was very slightly minus, which is rather more than would be expected in the general population, though in standard figures, such as Hertel's<sup>7</sup>—who in 12331 eyes found 10 to 15% myopic, 30% emmetropic, and 50 to 55% hypermetropic—it is never clear whether myopia of less than one dioptre is counted as emmetropia or not.

Eleven of the 28 girls wore their correction at work; seven more had bought glasses from sight-testing opticians, but never wore them. Five of the 56 eyes were absolutely emmetropic so far as could be made out without a mydriatic—a high proportion compared with the generally accepted figure of 1 to 2% for the general population. All the eyes except two (the partially amblyopic eye of the squinter mentioned above and the left eye of an almost emmetropic girl with a small corneal scar) had full visual acuity, varying from 6/6 to 6/4. It would appear that a low error of refraction is an advantage, but that a moderately high error, if corrected, is no bar. The correction of the low errors does not seem to be necessary.

#### Master Eye and Hand

Three of the girls showed a left master eye; one of these was left-handed, one ambidextrous, and one right-handed. The rest were right-eyed and right-handed.

#### Muscle Balance

The results in this group of tests are very interesting, as they show a much higher degree of binocular vision than was found in the analysis of the symptom-free R.A.F. recruits. Considering distance tests with the Maddox rod first, we found in 15 girls no imbalance, in four a slight exophoria of less than 1Δ, and in nine an equally slight esophoria. In none was there any vertical imbalance. (Grieve and Archibald found 5.3% with deviations of more than 4Δ horizontal or 1.5Δ vertical in their R.A.F. group.)

The results on the wing test were equally good. Twenty-two of the 28 showed a lateral deviation of 2Δ or less, and all of these saw the arrow quite steady (11 saw it dead on 01 all the time) and with no tendency to slip on the scale. Of the remaining six, two saw the arrow slip out to 4Δ, one to 6Δ, and one to 3Δ (esophoric), and so would have been counted normal by the usual standards, leaving two only really abnormal. One of these—the squinter, with high hypermetropia—saw the arrow at 11Δ (esophoric), but usually suppressed her left eye; the other, a left-handed girl with doubtful binocular vision for near objects, also saw it at 11Δ (esophoric). This is very different from the findings of Grieve and Archibald, who stated that 23.6% showed lateral deviations of 4Δ or more and vertical of 1Δ or more. It would appear, therefore, that orthophoria for near vision is more definitely selected than is approximate emmetropia.

Further investigations into the binocular condition at the near point were done, using a stereoscope, and testing also convergence, voluntary convergence, and the results of the cover test.

#### Stereoscopic Vision

A simple stereoscopic card (the two arrows) was first shown. The girl with the accommodative squint had doubtful appreciation of depth, but all the others except one (also doubtful, but apparently otherwise binocular) saw the perspective correctly at once. They were then shown a very difficult stereoscopic test which has so far not been extensively used. It is one of the set of rotating stereograms (Livingston) used in the R.A.F., and represents a variety of small objects (camels, palm trees, and pyramids) which should appear at varying depths that are stereoscopically unconnected with and often at variance with the relative size of the objects. Thus, for example, the largest camel is not the nearest, so that judgments based on size and probability are ruled out. If all the objects are seen in their right relationship the person has better than normal stereoscopic vision. Of these 28 girls, six saw all the objects correctly. In a control group of 30 nurses and medical students of the same ages picked at random, only two could perform this test correctly. Of the remaining 22 girls, six got some of the objects correctly placed and 16 could not do the test. This is a performance much better than the average as at present known for this test.

#### Convergence, Voluntary Convergence, and Cover Test

Convergence on an object held up to four inches from the eyes was present in all. In one it was poorly maintained, this girl being the non-squinter with doubtful stereopsis mentioned above. Voluntary convergence was present in 23 of the 28, though it was fair in three and poor in four of them. In the five in whom it was not present the cover test showed convergence in one and divergence in five. In the 22 of the 23 with voluntary convergence the cover test showed nothing and the remaining one a slight left exophoria. This girl had a myopic astigmatism, but worked without glasses and stated that her eyes were sometimes tired. She had been on the job for four years, and liked it and did not want to give it up. She spent a lot of her spare time reading. The five without voluntary convergence are interesting. One was the squinter, who of course used only one eye for the work. One was emmetropic and worked without difficulty. She stated that she thought she had lost the power of voluntary convergence after diphtheria, which had involved her eyes. Another

emmetrope complained of tired eyes and occasional headaches after six months on the job. The fourth complained of sudden pains in her eyes and "blackness" suggestive of migraine. The fifth was myopic and tended to read monocularly. She had occasional migraine. She had done the job for seven years, but did not like it much.

### Headaches

Eleven girls said they never had headaches, five said they had a headache at their period, and three had a history suggestive of migraine. Of the eleven without headache all had voluntary convergence, or were monocular for near work. One stated that she had headaches at the cinema but not at work; another said that being indoors too much gave her an occasional headache. There was no serious complaint of either headache or eye strain. Six who did not like the job complained vaguely of tired eyes. One was aged 40, and showed an exophoria of 6Δ on the wing test and poor voluntary convergence; three had no voluntary convergence (described above).

### Recreations

An attempt was made, by asking whether the recreation of choice was one involving close work, to ascertain whether there was any sense of ocular discomfort after work. The recreations mentioned in order of popularity were reading (13 times), sewing, knitting, and cinemas (7 times each), dancing (5 times), cycling (4 times), swimming, walking, and other outdoor things (3 times each), housework and gardening (once each). Most of them mentioned more than one hobby. It would appear, from the large number who put reading and close work first, that it was unlikely that there was any case of true eye strain in the group. None of the girls considered that the work had hurt their eyes in any way.

### Psychological Test

The result of this test shows that, out of the total of 28 workers ranging in age from 15 to 40, 21 must be considered normal and well adjusted. Of the remaining 7, 4 may be borderline cases who, if subjected to severe strain, might well break down and develop psychological difficulties, and 3 show definite signs of disturbance. The accompanying tables show

TABLE I.—Percentage in All Groups Above and Below the Danger Line

Groups	No.	Stable Subjects %	Unstable Subjects %
Superior adults (England) .. .. .	23	96	4
Superior adults (U.S.A.) .. .. .	33	94	6
Student nurses (U.S.A.) .. .. .	48	88	12
Women in Services (U.S.A.) .. .. .	218	87	13
Unselected adults (U.S.A.) .. .. .	31	83	16
Factory workers (England) (present group) .. .. .	28	75	25
Young male prisoners (U.S.A.) .. .. .	225	68	31
Students under psychiatric treatment (U.S.A.) .. .. .	30	46	63
Mental patients (U.S.A.) .. .. .	143	23	76
Total tested .. .. .	779		

the comparison between this group and other groups whose results have been verified by outside information, and the low intermediate position of the present group, which might have been expected as typical of unselected factory workers. The more detailed analysis in Table II shows very interesting comparisons between the different groups.

TABLE II.—Percentage within All Groups at Different Levels

Groups	No.	Highest Group %	Good Average Group %	Doubtful Group %	Disturbed Group %
Superior adults (England) .. .. .	23	87	9	4	0
Superior adults (U.S.A.) .. .. .	33	94	0	3	3
Student nurses (U.S.A.) .. .. .	48	80	8	8	4
Women in Services (U.S.A.) .. .. .	218	73	14	9	4
Unselected adults (U.S.A.) .. .. .	31	77	6	13	3
Factory workers (England) (present group) .. .. .	28	29	46	14	11
Young male prisoners (U.S.A.) .. .. .	225	44	24	16	15
Students under psychiatric treatment (U.S.A.) .. .. .	30	33	13	23	30
Mental patients (U.S.A.) .. .. .	143	13	10	14	62
Total tested .. .. .	779				

Comparison of the results of this test on these workers with the results on the other known groups shows that the factory workers come out where they might be expected to be found: they are below the superior adults, the unselected adults, the student nurses, and the women in the Services. In the highest group they have a smaller percentage than the prisoners or the students who are in the hands of a psychiatrist, but they have a much higher percentage of "good average." Their percentage of "seriously disturbed" individuals (11%) is lower than that of the prisoners (15%) or of the students (30%), but markedly higher than that of the superior adults, both English and American. It is also higher than among the student nurses and women in the Services, who will, of course, have been carefully selected on the basis of screening tests. The workers appear to compare badly with the American group of "unselected adults." Unfortunately Harrower-Erickson gives no information on the make-up of this "unselected" group, but if it was a true random sample of the adult population we must assume that these workers include some neurotics who make satisfactory adjustments at this particular job. This may well be true, and, if it is, it would indicate that this type of work suits some types of neurotics. Obsessionals—for example, compulsion neurotics—and some anxiety cases might find a haven in this work, since it makes little or no demand on intelligence or responsibility and reassures them by its monotony.

It should be stated that most of the disturbing signs shown by these workers are signs of general or focal anxiety, and it may be that some of this can be accounted for by the fact that they are living through a period which for many of them must involve acute emotional strain. Those with the least psychological resistance are likely to show more signs of disturbance than they would in time of peace.

Study of individual records shows some interesting correspondences with the information gathered from the girls when their eyes were examined. Of the six who said that they did not like the job two show signs of considerable disturbance; both give very meagre and attenuated records. One of these—the only one who tried to avoid doing the psychological test—revealed in her interview that she had had a nervous breakdown and still suffers from night terrors. The other complains of headaches at the back of her head, which she says she has always had; and she states that her mother has them too. Neither of these girls has full voluntary convergence. Of the remaining four, two were previously cooks and much preferred that work to their present job, which they said they would leave directly the war ended. Their responses also revealed instability. Of the remaining two, one had a history suggestive of migraine, but her Rorschach reaction was normal; the other gave a very excellent Rorschach result, which shows that the job is not using her full ability.

Of those showing the highest scores (best adjustment) one was the charge hand who had been on the job 13 years, four were perfectly content in the job, and two were superior girls who thought the job monotonous and were obviously capable of taking more responsibility than they were given. It is of interest that the only girl whom the management considers unsatisfactory is the one who gives the best Rorschach record of the whole group. She has a very rich full set of responses with no single weak sign. It may well be that she is too good for this job and is wasting a large part of her ability.

### Conclusions

In studying this group of people selected by trial and error and found empirically to be able to do excessively close work without fatigue, certain characteristics stand out—namely, their extremely highly developed stereoscopic sense and muscle balance at the near point. This would appear to be more characteristic and more important than their refraction, though selection has worked to improve the average of this as well. The few complaints of dislike of the job came from persons with phorias rather than with high refractive errors. This is encouraging, since it should mean that by treating phorias more people could be fitted for close work.

From this it follows that if one wishes to predict whether any given person will be suitable for continued close work, certain criteria can be suggested. The person should be



orthophoric on the wing test, should have no hyperphoria, and should have well-developed stereopsis and a corrected visual acuity of 6/6. Failing this, the subject should be monocular for near vision.

On the psychological side it cannot be claimed that testing is necessary for the selection of workers for this particular department, since the management, from long experience, only tries girls whom it has good reason to think will prove suitable. Those who show fatigue during the training period are not retained. We are not in a position to generalize as to what type of human being is best suited for this work, but, on the evidence of this one test, we might say that, although a few neurotics may be able to do it, the safest group are the good average people who are not unduly blessed with imagination nor are highly intelligent—a statement which probably holds true for any repetitive factory process. If, therefore, selection tests in industry were contemplated, the factors on which judgment of fitness for close work should be based would appear to be, in order of importance: (1) binocular balance: (2) refraction; (3) psychological stability.

It would seem likely to be of advantage, in industrial and other processes such as that described, to test the candidate with these points in mind before starting training, which otherwise may only prove to be a waste of time.

## REFERENCES

- 1 Grieve, J., and Archibald, D. H. (1942). *Trans. ophthalm. Soc.*, 62, 285.
- 2 Mann, I. (1940). *Brit. J. Ophthalm.*, 24, 373.
- 3 Harrower-Erickson, M. R. *A Multiple Choice Test for Screening Purposes*. Dept. of Neuropsychiatry, Univ. of Wis.
- 4 Klopfer, B., and Kelley, D. M. *The Rorschach Technique*, World Book Company, New York.
- 5 Harrower-Erickson, M. R. (1940). *Bull. Canad. psychol. Ass.*, Dec.
- 6 Dunstan, W. R. (1934). *Brit. J. Ophthalm.*, 18, 404.
- 7 Jackson, E. (1932). *J. Amer. med. Ass.*, 98, 132.
- 8 Parsons, J. H. (1906). *Pathology of the Eye*, Vol. 3, London.

## THE ACTION OF ELECTRIC BLANKETS

BY

G. MALCOLM BROWN, D.Phil.Oxon, M.R.C.P.

AND

K. MENDELSSOHN,\* Ph.D.Berlin

(From the Nuffield Department of Clinical Medicine, Oxford)

In a previous communication (Brown, Evans, and Mendelsohn, 1943) the action of radiant-heat cradles was recorded. Continuing this work on heating apparatus in clinical use, we have carried out an investigation on the action of electric blankets. These two methods of supplying heat to the body differ very much in their physical aspects, for the cradle acts mainly by heat radiation,\* whereas heat from the electric blanket is conveyed to the patient almost exclusively by conduction. It seemed of interest, therefore, not only to observe the action of the electric blanket in clinical use, but also to compare the effects of both methods on the same patients under similar conditions. The difference in physical action between the two methods naturally entails certain differences in efficiency, applicability, and supervision, and one of the objects of this investigation was to decide which method could be used most advantageously for different purposes.

The electric blanket which we used had been supplied by Thermega, Ltd. It is a large heating pad of the ordinary type, measuring 33 by 46 in. Heat is generated by a current (mains supply) passing through a resistance element. The maximum temperature of the electric system is limited by thermostatic control of the current supply. The average consumption was found to be about 120 watts, and varied but little with the temperature of the heating element. The current passing through the blanket was 0.511 amp. at the outset, 0.512 amp. after 1 hour, and 0.517 amp. after 4 hours. The total amount of heat produced by the blanket is therefore about 100 kilocalories per hour.

The temperature of the heating element proper must be kept low for reasons of safety. Since the material between the actual heating wire and the skin of the patient is probably opaque for far infra-red radiation—the only radiation which the heater emits—it appears reasonable to assume that practically all the heat taken up by the patient is by conduction.

## Physiological Action

The method of clinical use of the electric blanket consists in putting the blanket on the bed, covering it with an ordinary woollen blanket, and placing the patient on top of this. For reasons which we shall discuss later, the method of covering the patient has a very considerable influence on the rise in body temperature. In our case one woollen blanket was used and the patients were allowed to put their arms on top of the cover. By placing a thermometer on the bed in the position to be occupied by the patient it had been found that temperature equilibrium was attained only after about two hours (Fig. 1). We therefore heated the blanket for at least two hours before the patient was placed on it.

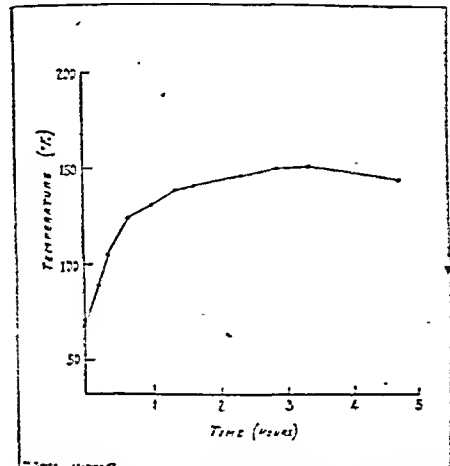


FIG. 1.—Curve showing the temperatures recorded by a thermometer placed in the position of the patient above the electric blanket.

The tests were carried out on volunteers, who were submitted to heat treatment with the blanket for periods ranging from 1½ to 2 hours. The body temperature was determined in some cases orally, using an ordinary clinical thermometer, and in others with an electric recording rectal thermometer. One characteristic temperature/time curve showing the results with the electric blanket and the radiant-heat cradle is reproduced in Fig. 2. Both these curves show that the first reaction to

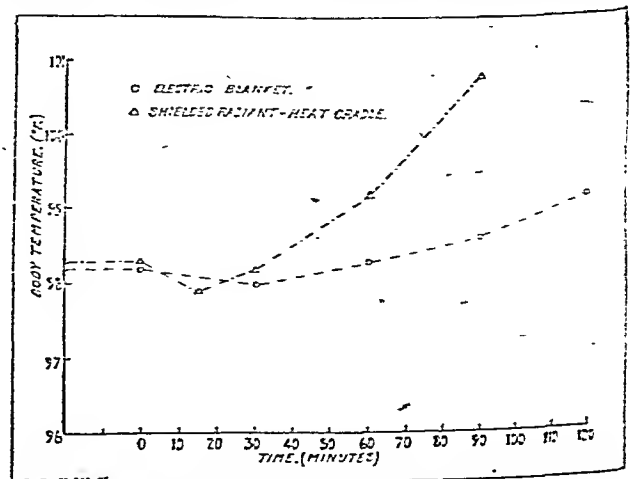


FIG. 2.—The body temperature of a subject heated first with the electric blanket and later with the radiant-heat cradle.

the application of heat is a decrease in body temperature. This peculiar phenomenon had already been observed in 9 out of 12 experiments with the radiant-heat cradle. Of the 7 cases

\* In receipt of a personal grant from the Medical Research Council.

† As has been emphasized before (Brown, Evans, and Mendelsohn, 1943), heat conduction and convection through the air inside a cradle also play an important part in conveying heat to the patient, but it is not known how large this part actually is.

investigated with the blanket, 5 showed this initial temperature decrease. It therefore appears that the phenomenon is quite generally a result of heat application and is not confined to heating by radiation. It was noted, however, that, whereas the temperature drop in the cradles occurred at 5 to 20 minutes after the beginning of treatment, it occurred with the blanket only at 30 to 90 minutes after heat was first applied.

The average rise in body temperature which we observed when using the blanket was about  $0.45^{\circ}\text{F.}$  per hour (see accompanying Table). This is much less than has been reported

Table showing the Rise in Body Temperatures, the Heat apparently taken up by the Subject, and the Heat generated by the Apparatus in 14 Experiments

Case No., Sex:	1 M	2 M	3 F	4 M	5 M	6 F	7 F
Time (min.)	120	120	120	90	90	105	90
$\Delta T^{\circ} (\text{F.})$	1.7	0.5	1.1	0.4	0.6	0.6	0.7
$Q^{\circ} (\text{cal.})$	63	20	35	15	23	17	18
$P^{\circ} (\text{cal.})$	200	200	200	150	150	175	150
$\Delta T^{\circ} (\text{F.})$	2.1	1.0	1.6	2.5	0.8	0.8	0.5
$Q^{\circ} (\text{cal.})$	78	40	51	93	31	22	21
$P^{\circ} (\text{cal.})$	970	1,200	970	780	780	875	750

$\Delta T^{\circ}$ : Rise in body temperature.  $Q^{\circ}$ : Heat apparently taken up.  $P^{\circ}$ : Heat generated by the apparatus when the subject was treated with the electric blanket.  $\Delta T^{\circ}$ ,  $Q^{\circ}$ ,  $P^{\circ}$ : The corresponding figures when the subject was treated with the radiant-heat cradle.

by others. Neymann and Osborne (1934), for instance, find an hourly rate of rise of  $1.1^{\circ}\text{F.}$  in rectal and  $1.8^{\circ}\text{F.}$  in axillary temperature for the first two hours of application. This discrepancy can probably be explained by the method of covering the patient. If the electric blanket is wrapped around the body and the arms are kept in, the rate of temperature rise is bound to be greater. In fact, as Epstein and Cohen (1935) have reported, a rise in body temperature of  $1.6^{\circ}\text{F.}$  to  $1.8^{\circ}\text{F.}$  per hour can be produced without the use of any heating equipment simply by wrapping the patient tightly in a number of blankets and a rubber and a canvas sheet.

At first sight it seems astonishing that, merely by preventing the loss of metabolic heat, increases in body temperature occur which are about as high as those obtained with quite powerful external heating methods. An explanation for this can be found by comparing the amount of heat actually taken up by the patient from the external heat source with his own metabolic heat production. In the Table the total heat ( $P^{\circ}$ ) supplied in our tests by the blanket, and the heat ( $Q^{\circ}$ ) apparently taken up by the patient, are given. This amount of heat "apparently taken up" represents, however, not necessarily the real amount of heat received by the patient, since the calculation does not take account of any change in the rate of loss of heat by the patient through physiological processes. The total heat generated by the blanket (100 cal./hour) is of the same order as the metabolic heat itself. Only 15% ( $\frac{Q^{\circ}}{P^{\circ}}$ ) of this heat supply, however, is apparently taken up by the patient. It is therefore not very surprising that an arrangement which prevents the loss of part of the metabolic heat will heat the patient as quickly as an electric blanket, which, after all, delivers to the patient approximately only the heat which he normally generates himself.

#### Comparison of the Electric Blanket with the Radiant-heat Cradle

The same 7 volunteers were subjected to heat treatment of equal length with the shielded cradle described by us in our earlier paper. The results are given in the Table. As can be seen in Fig. 3, the cradle heats about twice as much as the blanket. The method of treatment with the cradle was that previously recommended by us. Twelve bulbs were used at first, and the number was reduced to 8 bulbs after 20 to 30 minutes. The average rate of temperature rise observed in the present research was  $0.8^{\circ}\text{F.}$  per hour. Considering the scatter, this result is in remarkable agreement with our previous work, when we found the rise to be  $1^{\circ}\text{F.}$  per hour. A slightly lower value was to be expected in the present tests, since in the first investigation 12 bulbs had been used throughout. The temperature rise produced with the blanket was about the same as that observed with the unshielded cradle used in the orthodox way.

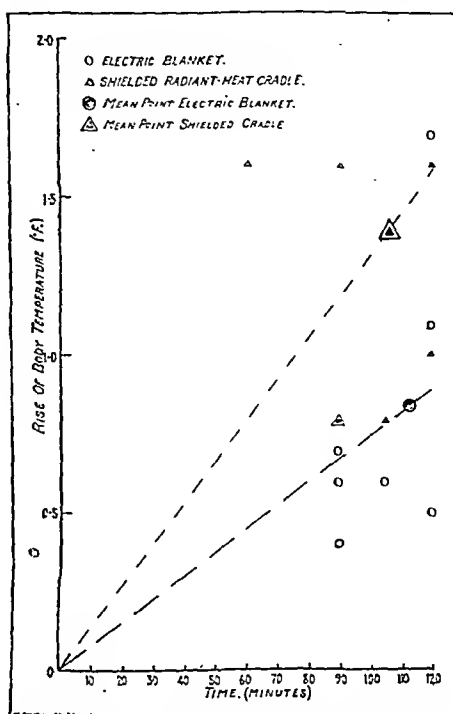


FIG. 3.—The rises in body temperature observed in 7 subjects treated with the electric blanket and the radiant-heat cradle.

While it is true that the shielded cradle supplied nearly twice as much heat to the patient as the blanket, it is less economical, because it produces five times as much heat at the source ( $\frac{P^{\circ}}{Q^{\circ}}$ ). The heat taken up by the patient is only about 5% of the total heat generated ( $\frac{Q^{\circ}}{P^{\circ}}$ ). As the difference in the cost of electricity can in most cases be neglected, the cradle's lack in economy is not very serious.

Thinking, however, in terms of absolute quantities of heat taken up by the patient, the low efficiency of the cradle compared with the blanket requires some explanation, since the total amount of heat generated by the former is about five times the metabolic heat. It appears to us that the two main factors which lower the efficiency of the cradle are heat loss to the outside and heat loss from the patient by perspiration. With the blanket, on the other hand, both these factors are reduced to a minimum, since there is less heat loss from the heating element, which is placed between the bed and the patient, and since the covering blanket contains practically no space for the evaporation of sweat. Experiments to improve still further the efficiency of the cradle are in progress.

#### Discussion

The electric blanket has advantages which recommend it for certain clinical uses. It is safe and causes no discomfort at ordinary heating rates. When used to produce artificial hyperpyrexia there have been cases of fire due to a fault in the heating element, but we know of nothing similar occurring in ordinary use. It requires little supervision. None of our volunteers complained of any skin discomfort, and the risk of burns is less than with an unshielded cradle. The shape and the position in the bed are but a small inconvenience to the nursing staff. A most important disadvantage, however, is the long period taken to reach the maximum temperature and the lack of variability of control. With the cradle it is possible to raise the temperature of the air around the patient's body very quickly to a given degree and to maintain it at that level for an indefinite time. Even at its maximum temperature the electric

blanket raises the body temperature only half as quickly as the cradle. The cradle is the better instrument when heat is required quickly and in large quantities. When forethought is possible and less heat is required the blanket is to be preferred. To warm the waiting bed for the patient or to keep him warm out of doors in cold weather the blanket should be used, but when heat is prescribed for the victim of an accident the heat cradle is indicated.

The administration of heat presents several problems, aside altogether from the question of its therapeutic value, which we do not wish to discuss. For instance, we are at a loss to explain the decrease in body temperature which occurred in the first period of treatment in a great majority of our cases. At the same time the skin temperature was rising rapidly to its final value. This effect of an artificially increased skin temperature on the body temperature needs more investigation. We must also keep in mind that the physiological reaction in local application is probably quite different from that in general application of heat. The same dose of radiated or conducted heat may result in a very different response, depending upon its localization. It should be clear what is needed when heat is prescribed—an increase in body temperature or merely the application of warmth to the skin. Each requires its own mode of application. A hot-water bottle is an easy way to warm the skin, and in many cases that is all that is indicated. However, 500 c.cm. of water cooling through 50° C. does not make an important contribution to body heat, and where this must be increased the shielded cradle is the instrument of choice. It is clear from our observations that in the healthy volunteer under treatment the rate of heat loss is greatly increased. His skin is flushed and soon covered with perspiration. The effects on the temperature-control mechanism in the cold shocked patient may not be the same. A completely rational therapy will have to wait on a further knowledge of the relation of all these factors.

#### Summary

The electric blanket acts by conduction of heat to the patient. Even when the bed is warmed beforehand it is only half as quick as the radiant-heat cradle in raising the body temperature. On the other hand, it occupies little space and is almost foolproof.

Our thanks are due to Prof. L. J. Witts for his continued interest in this work.

#### REFERENCES

- Brown, G. M., Evans, D. S., and Mendelsohn, K. (1943). *British Medical Journal*, 1, 66.  
Epslein, N. N., and Cohen, M. (1935). *J. Amer. med. Ass.*, 104, 883.  
Neymann, C. A., and Osborne, S. L. (1934). *Amer. J. Syph.*, 18, 28.

## ACUTE NICOTINIC ACID DEFICIENCY (ANIACINOSIS)

BY

**B. GOTTLEE, M.D., M.R.C.P.**

Senior Resident Physician, St. Alfege's Hospital (L.C.C.)

General physicians are occasionally confronted with cases of mental confusion or stupor in middle-aged or elderly persons for which no obvious cause is found. A provisional diagnosis of uraemia, arteriosclerotic dementia, or cerebral vascular accident is made and sedatives are administered. Some cases are transferred to mental observation wards. Death usually occurs in a few days as a result of bronchopneumonia, and post-mortem examination may show no cause for their mental state. I believe that an appreciable number of lives could be saved if nicotinic acid (niacin) therapy was instituted rapidly in these patients. The following is a brief description of five such cases.

#### Case I

A woman aged 56 was admitted to Highgate Hospital (L.C.C.) on March 7, 1942, in alcoholic coma. She was cyanosed, with the pulse imperceptible. Following warmth, oxygen, and 4 c.cm. of nikethamide (diethyl nicotinamide) she revived. On March 8 she was quite well, apart from some amnesia for recent events. On the 10th she became confused, restless, and irrational, and declined all her food. Her confusion gradually became worse, and on the 11th she was completely disorientated as to time and space, wandering about the ward and talking loudly. Transfer to the mental observa-

tion ward had to be considered. Apart from nystagmus no physical abnormality was noted. 100 mg. of sodium nicotinate and 25 mg. of thiamin were given intravenously. A few hours later she was quieter and less confused. Subsequently she was given daily 200 mg. of sodium nicotinate intravenously, 100 mg. of nicotinic acid or 25 mg. of thiamin. After a total dosage of 400 mg. of nicotinic acid in 28 hours she was greatly improved. She was well orientated as to time and space, and quiet and co-operative, remaining so until her discharge on April 2, 1942. Two months later, when seen as an out-patient, she had no recurrence of mental symptoms and was perfectly well. She was a heavy drinker, mostly of beer, and her diet consisted mainly of white bread, butter, and tea, and some boiled vegetables. She hardly tasted meat. Her gastric juice showed complete achlorhydria. Her blood W.R. was negative. Electrocardiograms revealed left ventricular preponderance but no other abnormality.

#### Case II

This patient, a woman aged 76, was admitted to St. Alfege's Hospital on March 12, 1943, in a state of mental confusion, disorientation, restlessness, and frothing at the mouth. She was incontinent of urine and faeces. The mental symptoms had developed gradually during the past week. She was markedly anaemic, with petechiae and purpura over the whole body and large bruises on both legs. The blood count showed R.B.C. 1,000,000, C.I. 1.4, granulocytes 2,100. Her diet had consisted almost entirely of bread, margarine, and tea for the past few months. She was almost totally blind owing to bilateral cataracts, and her aged husband was a chronic invalid, hence the difficulty of obtaining a suitable diet. She was considered to be suffering from nicotinic acid deficiency, scurvy, and pernicious anaemia. As she was seriously ill, nicotinic acid, ascorbic acid, and liver injections were immediately given. Following 300 mg. of nicotinic acid by mouth in 24 hours her mental state had improved dramatically. She was conscious, rational, and co-operative, and the control of her sphincters was satisfactory. She was still disorientated as to time. After a total dosage of 600 mg. of nicotinic acid by mouth in 48 hours she was mentally clear, and remained so until her discharge from hospital on May 17. The petechiae and bruises disappeared within a week after 1,500 mg. of ascorbic acid injections had been given. The anaemia responded satisfactorily to liver therapy.

#### Case III

A man aged 46, a publican and a heavy drinker of rum and beer, was admitted to St. Alfege's Hospital on June 7, 1943, with ischio-rectal abscess. He was mentally normal on admission. Owing to chronic alcoholism his diet had always been erratic. Four years previously he had had a sore tongue, with cracks which took many months to heal. Since June 2, when the abscess developed, he had had almost no food apart from alcohol. On June 7 the abscess was incised under spinal anaesthesia. Twelve hours after the operation he became delusional and hallucinated, but had insight into his condition. He was worse at night, when he was noisy and disturbed. He was transferred to the mental observation ward and considered. When seen by me on June 10 he was confused and completely disorientated to time, but was aware of his confusion. His mouth and tongue were fiery red and dry, but no other physical abnormality was noted. Although he was subsequently unaware of this examination he was able some days later to give a vivid description of his delusions and hallucinations. After a total dosage of 600 mg. of nicotinic acid by mouth in 36 hours his mental state, as well as his tongue, became normal, and remained so until his discharge from hospital on June 21. When seen one month later as an out-patient he was perfectly well. The gastric juice showed hypochlorhydria. The blood W.R. was negative and the blood urea normal.

#### Case IV

A woman aged 62 was admitted to St. Alfege's on Sept. 16, 1943, in a state of mental confusion and disorientation. She had always been a small eater, and, according to her husband, "picked at her food like a baby." Since the death of her son a year ago her appetite had become even worse; but, apart from chronic constipation, her general health remained fairly good. Following some mental shock a month before admission, she became listless and could only be persuaded to take bread soaked in milk. There was no history of alcoholism. The angles of her lips became cracked three months previously. Her memory began to fail two weeks before admission and she was confused and disorientated, with incontinence of urine. Her tongue was sore for 10 days. Her symptoms grew progressively worse. She was given orally 90 mg. of thiamin and 150 mg. of nicotinic acid daily from the time of her admission until Sept. 27, without improvement.

When I first saw her on Sept. 27 she was confused and disorientated to time and space. She was incontinent of urine, and her memory, especially for recent events, was grossly impaired. She was a small thin woman, with an inelastic and dehydrated skin. Her nose was red and the backs of her hands were smooth and

shiny. The tongue was red, angry-looking, and completely deficient of papillae. Her lips were swollen and inflamed with fissures at both angles (she had worn no dentures for 12 months). There was bilateral blepharitis, with purulent conjunctival discharge, and she had obvious bilateral circumcorneal injection but no corneal ulcers. There was no evidence of nystagmus or peripheral neuropathy. Investigations resulted as follows: Blood W.R., negative; C.S.F., normal; blood urea, 42 mg. per 100 c.cm.; blood count, normal. A test meal on Oct. 29 showed the presence of free HCl in normal amounts. The barium test meal was normal.

The mental symptoms considered relevant were followed up according to the routine mentioned by Sydenstricker and Cleckley (1941). Nicotinic acid orally had no effect on her illness, but response was rapid after intramuscular injection of nicotinic acid. The lips as well as the tongue improved with nicotinic acid, but riboflavin was necessary before the fissure on the right commissure healed satisfactorily. On Nov. 25 she was discharged perfectly well apart from a mild cystitis, the result of repeated catheterization. In this patient, although other evidences of pellagra were present, the mental symptoms were predominant.

#### Case V

A woman aged 71 was admitted to St. Alfege's on Oct. 22, 1943, with a large, painful, malignant ovarian cyst. This was removed on Oct. 23 under N<sub>2</sub>O-oxygen-ether. Thirty-six hours later she became confused and restless, and attempted to get out of bed. When seen on Oct. 26 she was completely confused and disorientated to time and space, and memory was grossly impaired. She had bilateral conjunctival discharge, with circumcorneal injection but without corneal ulcers. No other evidence of nutritional deficiency or of C.N.S. or cardiovascular changes was noted. The tongue was dry and furrowed. Owing to her illness she developed anorexia, and her diet was grossly deficient for some months before admission. She was given daily 600 mg. of nicotinic acid orally, 1/2 oz. of marmite, and milk up to 2 pints. After receiving 600 mg. of nicotinic acid a marked improvement in her mental state resulted, and after 1,200 mg. in 48 hours her mental state became normal and remained so until her discharge from hospital three months later, despite complications of bronchopneumonia and cystitis.

#### Cases in the Literature

It is now generally recognized that the mental as well as the skin and most alimentary-tract lesions of pellagra are relieved by nicotinic acid. Hardwick (1943) recently described 12 such cases seen in Britain in a mental hospital and a mental observation ward. Cleckley *et al.* (1939) described cases of stupor with little or no evidence of pellagra which improved rapidly after nicotinic acid therapy. Jolliffe *et al.* (1940) described a syndrome in chronic alcoholics which they named nicotinic acid encephalopathy. The symptoms were clouding of consciousness, cogwheel rigidities, and uncontrollable grasping and sucking reflexes. Rapid recovery followed nicotinic acid therapy. Sydenstricker and Cleckley (1941) described cases with diverse symptoms of stupor, manic excitement, delusions, hallucinations, and disorientation: these cases showed no other evidences of pellagra, but responded rapidly to nicotinic acid. Sydenstricker (1943) suggested that the three latter groups of cases, as well as Wernicke's encephalopathy, are examples of acute nicotinic acid deficiency, of which that of Jolliffe *et al.* is the most acute and complete. Sydenstricker postulated that these cases have marked functional disturbances but show no anatomical changes, whereas pellagra is due to chronic partial nicotinic acid deficiency and anatomical changes are present. Nicotinic acid takes part in the formation of coenzymes 1 and 2, which are concerned in cellular respiration and possibly carbohydrate metabolism. Thus acute nicotinic acid deficiency may result in marked functional disturbances of the brain, since that organ has a high and more urgent requirement of oxygen and carbohydrate than other tissues.

Although pellagra itself is rare in Britain (Kinnier Wilson, 1940) it is likely that acute nicotinic acid deficiency may be more frequent. These cases are most likely to be seen in municipal hospitals or mental observation wards. As I was able to find reference to only one such case in Britain—by Slater (1942)—a brief description of the clinical features of this condition will not be out of place here.

#### Aetiology of Aniacinosis

(1) Elderly people living alone and in poor circumstances find wartime shopping especially difficult. Their diet is thus unlikely to contain fish, meat—particularly liver—and dried

eggs, which are important sources of nicotinic acid at the present time among the general population. After an acute infection, such as pneumonia, or an operation, they are likely to obtain a diet consisting of carbohydrates and fluids only: acute nicotinic acid deficiency may thus occur. (2) Chronic alcoholism due to: (a) anorexia; (b) associated gastritis and achlorhydria, which (c) may interfere with the absorption of the vitamin, nicotinic acid, which is needed for the metabolism of alcohol in the brain, as shown by Devan (1943). (3) Gastro-intestinal disturbances such as ulcerative colitis and dyspepsias, organic and functional, with restricted diets and interference with absorption of the vitamins.

#### Diagnosis

Any of the following symptoms—mental confusion, delusions, hallucinations, stupor, manic excitement, confabulation—or those of nicotinic acid encephalopathy may occur (Jolliffe *et al.*, 1940). Pellagra, thiamin deficiency, ophthalmoplegia, or other vitamin-deficiency diseases such as scurvy, as in Case II, may be present. In the majority of cases, however, no other evidences of vitamin deficiency are found. The fiery-red so-called "toxic tongue" without loss of papillae may be noted in some, as in Case III. The mental symptoms are likely to become progressively worse after parenteral glucose-saline and sedatives, the usual treatment in these cases. Some cases may be transferred to mental observation wards. Death is likely to occur in 4 to 5 days, with bronchopneumonia as the terminal event.

Uræmia, cerebrovascular accidents, arteriosclerotic dementia, frontal-lobe tumour, bromide intoxication, and neurosyphilis would have to be excluded. In cases of doubt, however, nicotinic acid should immediately be given in the large doses recommended by Sydenstricker. Important points in diagnosis are: (1) dietary history; (2) possible history of chronic alcoholism; (3) response to treatment with nicotinic acid, which usually effects dramatic improvement in 1 to 2 days. It may be mentioned here that nicotinic acid had no effect on four cases of advanced arteriosclerotic dementia treated in chronic hospital wards on the lines suggested by Sydenstricker.

#### Treatment

1. Sydenstricker suggested 100 mg. of nicotinic acid or 30 mg. of nicotinamide hourly for 10 doses in the first two days by mouth or by stomach-tube. In stupor or noncooperative cases sodium nicotinate in 100-mg. doses may be administered intravenously or intramuscularly. After two days 500 mg. of nicotinic acid daily for a few more days in 5 doses, then a residual dose of 25 mg. t.i.d. (Nicotinamide should be prescribed in cases in which vasodilatory symptoms are excessively uncomfortable.) It is likely that half the above dosage would be adequate in most cases. In encephalopathy and comatose or stuporous cases the full dosage should be given.

2. Marmite 1/2 oz. or bemax 1 to 2 oz. daily.

3. Thiamin in 25-mg. doses daily, particularly with associated neuropathy or ophthalmoplegia.

4. As soon as possible a good mixed diet, including fish, meat, liver, milk, and vegetables.

#### Summary

Five cases of acute nicotinic acid deficiency are described.

The clinical picture of this condition is discussed.

It is considered that in doubtful cases nicotinic acid therapy should be immediately tried.

My thanks are due to Dr. W. W. Sargant and Dr. E. Slater for their helpful suggestions; to Dr. S. Alexander for the notes on Case I, and to Dr. B. A. Young, medical superintendent, St. Alfege's Hospital, for permission to publish Cases II-V.

#### REFERENCES

- Cleckley, H. M., Sydenstricker, V. P., and Geeslin, L. E. (1939). *J. Amer. med. Ass.*, 112, 2107.  
 Devan, J. G. (1943). *Amer. J. Psychiat.*, 99, 565.  
 Hardwick, S. W. (1943). *Lancet*, 2, 43.  
 Jolliffe, N., Bowman, K. M., Rosenblum, L. A., and Fein, H. D. (1940). *J. Amer. med. Ass.*, 114, 307.  
 Slater, E. (1942). *British Medical Journal*, 1, 257.  
 Sydenstricker, V. P. (1943). *Proc. roy. Soc. Med.*, 36, 169.  
 — and Cleckley, H. M. (1941). *Amer. J. Psychiat.*, 98, 83.  
 Wilson, S. A. Kinnier (1940). *Neurology*, 2, 1360, London.

CHEST SCREENING IN THE ANTE-NATAL  
CLINIC

BY

RACHEL FRANK, M.D. Prague

Assistant Medical Officer to the Maternity Department, Paddington  
Hospital (L.C.C.)

AND

A. L. JACOBS, M.R.C.P.

Senior Resident Physician, Paddington Hospital

At the beginning of 1943 it was decided to institute a screen examination of the chest for all women attending the ante-natal department of Paddington Hospital, as part of the routine general examination which they undergo. This was organized by the maternity department and the medical department in co-operation, with the help of the radiographic staff.

## The Procedure

At her first attendance in the ante-natal department each expectant mother is given an appointment in the following week, and it was found that a single weekly screening session of 30 to 45 minutes enables the work to be covered without difficulty. With very few exceptions the mothers much appreciate this service and attend punctually, so that organization has been easy and has made very little demand on the hospital staff. The screening has always been done by the same person, and our practice has been to order full-size films in all cases where the screen examination reveals any abnormality of importance. For this purpose calcified foci have been included only when extensive, multiple, or accompanied by other shadows—the common small and compact Ghon focus or calcified gland focus being "passed" on the screen examination alone.

The scheme has now been in operation for a year, with an average weekly attendance of 20 to 30 women. We publish the following summary of the results as an indication of the possibilities of the method.

Total number screened in 1943 .. .. .	1,125
Total number of films ordered .. .. .	63
Findings in the films:	
No abnormality .. .. .	22
Active tuberculosis .. .. .	6
Pleural effusion .. .. .	1
Unilateral phthisis .. .. .	1
Bilateral phthisis .. .. .	4
Possibly active tuberculosis .. .. .	2
Probably inactive tuberculosis or doubtful tuberculosis .. .. .	9
Calcification shadows .. .. .	11
Non-tuberculous changes:	
Increased vascular shadows, general .. .. .	6
Increased vascular shadows, local .. .. .	2
Pleural or pleuro-pericardial adhesions .. .. .	2
Miscellaneous .. .. .	3
? Benign pleural neoplasm .. .. .	1
Partial collapse, ? cause .. .. .	1
Anatomical anomaly of ribs .. .. .	1
Approx percentages of tuberculous disease out of total screened:	
Active, requiring immediate admission .. .. .	0.5%
Possibly active, requiring close observation .. .. .	0.2%
Probably inactive or not definitely tuberculous, but requiring observation .. .. .	0.8%

For comparison with these figures we may take the findings in a group of women of roughly comparable age reported by Clive (1943). These were W.A.A.F. personnel, a group of 30,000, ages 17½ to 45, examined by miniature radiography. Clive found that 0.4% required immediate institutional treatment for tuberculosis and 0.6% required observation, of whom 0.2% were later found to need institutional treatment. Our figures appear to be very similar to these.

## Comment

The principle of mass investigation—searching for cases of tuberculosis among the apparently healthy—which has been quite extensively employed in some other countries since the last war, is gaining increasing adherence in this country. So far it has largely been confined to special groups of the population, such as nurses and medical students, who appear to be particularly exposed to the risk of tuberculosis, or those whose health is of special importance and who are organized in groups which make investigation relatively easy—e.g., Service

personnel. We think it is clear that pregnant women fall into the latter category, if not into the former, and the use of x rays in their supervision is both highly desirable and easily practicable. While we are prepared to agree at once that the most suitable method of mass investigation is by miniature radiography, we think that until apparatus for this becomes universally available (which is likely to be a considerable time) the possibilities of screen examination are by no means to be despised. It is clear that this method will reveal a number of cases of unsuspected tuberculosis comparable with, if not fully equal to, that found by miniature radiography, and it has the very great advantage of universal availability. Nearly every general hospital which does ante-natal work has a screen apparatus, and a simple system of collaboration between local authorities and hospitals, both voluntary and municipal, would make it possible to examine also those women who attend ante-natal clinics conducted outside the hospitals. In this way a very large proportion of the expectant mothers in the country could be brought under immediate observation. The method is quite economical, for films are needed only in about 5% of all women screened, and some further experience will probably enable the number of "unnecessary" films to be still further reduced.

In this brief note we have confined our attention to pulmonary disease, but screen examination also has its value for the assessment of cases of heart-disease, and draws attention to a certain number of cases which have been overlooked in the physical examination.

## Summary

Screen examination of the chest has been included in the general examination of all women attending the ante-natal department of a general hospital. Organization was found to be easy.

Figures are given of the number of cases of pulmonary disease discovered by this method.

Our thanks are due to Mr. A. R. Hayward, senior radiographer, and Auxiliary Nurse E. A. Gale for their help in organizing this work.

## REFERENCE

Clive, F. T. (1943). *Tubercle*, 24, 63.

## Medical Memoranda

Intussusception of Small Gut due to  
Foreign Body

Intussusception of the small gut is an uncommon occurrence, and the following case illustrates points of interest.

A young man 19 years of age, employed as an electrician, was admitted to the Pembroke County War Memorial Hospital on the evening of Oct. 21, 1943. He complained of some abdominal pain, but this was not stressed, and pain obviously was not a prominent feature. The history given was that after starting to eat his lunch, soon after midday, he was suddenly seized with severe abdominal pain, distributed to the umbilical region, accompanied by vomiting. He walked to the surgery of the medical officer, and was ultimately sent to hospital. On admission his general condition was satisfactory, and he made little complaint except for the occurrence of several bouts of vomiting. His temperature was 99.8°; the bowels were opened that morning.

Examination showed the presence of a smooth circular mass, slightly tender, of ill-defined edges, and situated on the right side a little below the umbilicus; it was movable transversely. The abdomen was opened that night by Mr. A. B. Davies. Dilated small gut presented in the wound, and the lower right abdomen was occupied by a curved intussusception about 8 in. long and situated about 12 in. from the ileo-caecal juncture. Attempts at reduction failed, and resection of gut with end-to-end anastomoses was carried out. Convalescence was uneventful. Subsequent examination of the removed gut showed the invaginating portion to be gangrenous, while one half of a steel screw occupied the lumen of the bowel at the apex of the intussusception.

The absence of urgency in clinical findings of this case contrasted with the gangrenous state of the gut in the intussusception. The swallowing of the steel screw which initiated the condition probably resulted from the habit of technicians of using the mouth as a temporary receptacle for such objects during their mechanical operations.

M. S. BURKE, M.B., B.Ch.

County Hospital, Haverfordwest.

G. R. WILLIAMS, M.B., B.Ch.



## Reviews

### THE EXTRA PHARMACOPOEIA, VOL. II

*The Extra Pharmacopoeia*; Martindale. Twenty-second edition, Volume II. (Pp. 1,217. 27s. 6d.) London: The Pharmaceutical Press, 1943.

Volume II of the 22nd edition of the *Extra Pharmacopoeia* has now appeared. This completes the second of the editions which have been prepared by Mr. C. E. Corfield and his assistants for the Pharmaceutical Society. It was a matter for great satisfaction when the Pharmaceutical Society took responsibility for the *Extra Pharmacopoeia*, but that is a responsibility which we hope is giving it a headache. It is to be feared that so long as many copies are sold the Pharmaceutical Society will be satisfied that all is well. All is not well. To say this is not to cast any reflection on Mr. Corfield. If a pharmacologist were to write a reference book on chemistry, Mr. Corfield would be the first to pat him on the back and say, "Well, poor chap, he did his best, but what does a pharmacologist know about chemistry?" Nevertheless a chemist, with no pharmacological adviser at his elbow, prepares the *Extra Pharmacopoeia*, a book dealing largely with new drugs and recent advances in medicine. It is not enough to refer special subjects to medical men. At the end of the preface there is a list of medical men from whom advice on certain sections has been obtained. These no doubt give excellent advice in their own line, but they do not help the editor-in-chief to take that balanced view of the whole field which only a person whose principal work in life is a knowledge of the action of drugs and their uses can enable him to take. It is surely the duty of the Pharmaceutical Society to find such a person to be at least co-editor of the *Extra Pharmacopoeia*.

The Society displayed a progressive spirit in 1926 when it founded *Pharmacological Laboratories*. It still maintains these laboratories, but there is an astonishing lack of connexion between them and the Society's publications. There has been little evidence in the *British Pharmaceutical Codex* of 1934 or in the two editions of the *Extra Pharmacopoeia* that these works have had the benefit of that kind of pharmacological advice which can only be given by those engaged in or trained in research. In what way does the book suffer under the present arrangements? It suffers because it includes a mass of data which is probably of no interest to anyone. For example, when Volume II was opened by chance, page 163 appeared. This page contains a detailed account (in very small print) of the determination of rotenone in derris. Now, who is interested in this? It may be that the *Extra Pharmacopoeia* is aiming at the whole world. It may hope to catch the analytical chemists as well as the doctors. For, of course, the analytical chemists are glad to know how to determine rotenone, particularly if Mr. Corfield is so obliging as to tell them how they can really do it. Surely, however, this is too much. The congestion is now too great. The Pharmaceutical Society should no longer tolerate this jumble of pharmacognostical information and analytical methods on the one hand with new drugs and advances in medicine on the other. They have two volumes. Cannot the one volume be used for the one, and the second for the other? Cutting down, however, there must be. The small print makes the book something which many will avoid. It can no longer be carried in the pocket, so why not make it larger and as easy to read, say, as *New and Non-Official Remedies*?

The analytical parts and laboratory methods are done well. The new drugs and uses are done less well. There are strange omissions. Pethidine is not mentioned in spite of a paper on this substance in the Society's own journal in 1940 (*Quart. J. Pharm. Pharmacol.* 13, 318). Pethidine is an important drug capable of relieving pain in those who cannot tolerate any of the opium alkaloids or heroin because these produce nausea and vomiting. Neither is there any mention of thiourea or thiouracil, the compounds now used for thyrotoxicosis. These are serious points which ought to persuade the Society to look for a competent adviser who can speak with authority as co-editor on matters medical. It is granted that there are very few to be found.

The Pharmaceutical Society, by its publications the *Codex*, the *Extra Pharmacopoeia*, and the *Quarterly Journal*, performs a valuable public service. To point out defects in these, and the need for improvements, is not to belittle this service, but is to indicate how this well-disposed Society, which we all respect, can make itself still more useful.

### ACUTE MEDIASTINITIS

*Acute Infections of the Mediastinum*. By Harold Neuhof, M.D., D.S., F.A.C.S., and Edward E. Jernegan, M.D., D.S., F.A.C.S. (Pp. 407; illustrated. 33s.) London: Baillière, Tindall and Cox, 1943.

It is fortunate that acute mediastinitis is not a very common disease, and therefore this volume, which contains detailed records of 100 personal examples of the condition, is of great interest. Neuhof's work on lung abscess is already well known, and any publication by him demands serious consideration.

After surveying the literature, the authors describe their cases, which they divide into four groups: those secondary to trauma of the oesophagus, those preceded by upper respiratory infections, those following infection of the lung or pleura, and finally those of miscellaneous aetiology. In no less than one-fifth of all the examples mediastinitis was due to trauma by instruments passed into the oesophagus—a warning to those who embark upon this form of endoscopy. However, the most common cause of acute mediastinitis was an upper respiratory infection, such as a retropharyngeal or cervical abscess. The surgical anatomy and pathology and the clinical features are discussed in great detail. The radiological diagnosis of the various forms of mediastinitis is well described and illustrated, and the treatment, both conservative and surgical, is considered at length. The authors state that a diagnosis of perforation of the oesophagus is an indication for immediate operation, but in other cases the presence of an abscess should be established, if possible, before drainage is undertaken.

Owing to the rapidity with which spread occurs in mediastinal infections, they will always carry a high mortality, and one object of this book is to draw attention to the circumstances likely to produce an acute mediastinitis, in order that they may be avoided. The book will be of particular interest to those who specialize in thoracic diseases, and it should be read by all who practise oesophagoscopy and gastroscopy. It is unfortunate that a certain lack of dogmatism, particularly in the sections on treatment, lessens the practical value of this interesting work.

### EMERGENCY SURGERY

*Emergency Surgery*. By Hamilton Bailey, F.R.C.S. Fifth edition. (Pp. 969; with 1,039 illustrations (some coloured). 75s.) Bristol: John Wright and Sons, 1944.

Like the book on clinical signs by the same author this may be described as a medical best seller. The new edition is a triumph of patience and perseverance on his own part and that of his publishers, for not only were the original type and blocks destroyed by enemy bombing, but this printing again suffered air-raid damage when it was nearing completion. All branches of surgery are covered, including specialties such as ophthalmology, oto-rhino-laryngology, and gynaecology, but details of fracture treatment beyond the principles applicable to compound fractures are not included. The chapter on the eye is written by Mr. Eugene Wolfe; those on the ear, nose, and throat are by Mr. E. Watson-Williams. These are excellent contributions, which make good reading and blend well with the remainder of the text.

The book as a whole is reminiscent of Lejar's *Urgent Surgery*, for which some years ago we had a great regard and to the author of which Mr. Hamilton Bailey pays tribute. We should like to see the vertical incision for draining a thoracic empyema recommended and illustrated, but our chief differences of opinion with the author are in the section on head injuries, notably with the view that the unconscious patient should be laid flat in bed, that compound fissured fractures of the skull should be left alone unless physical signs are present, and that extradural haemorrhage is often bilateral. The tourniquet illustrated on page 563 is in our opinion futile, and it is better to arrest haemorrhage from scalp wounds by putting haemostats, not as advised on the whole thickness of the scalp, but on the

cut edge of the galea aponeurotica, which is then retracted towards the wound edge. Nor can we agree with the statement that dehydration should not be practised for 48 hours after a head injury; it is at this period that its effects are so often needed to limit brain swelling and check oedema. These criticisms, however, merely emphasize our high regard for the book as a whole. An appendix contains some useful addenda culled from recent papers, and thereby adds to the value of this edition by bringing it thoroughly up to date.

### MEDICAL LIBRARIANSHIP

*A Handbook of Medical Library Practice.* Edited by Janet Doe. (Pp. 610. \$5.00 or 30s.) Chicago: University of Chicago Press; London: Cambridge University Press.

The American Library Association has performed a valuable service to all librarians and those who use medical libraries by publishing *A Handbook of Medical Library Practice*. The book is comprehensive and covers the whole subject in an admirable manner. The first chapter deals with development, distribution, and administration, with appendices showing libraries which possess over 100,000 volumes, and libraries outside North America listed under countries. This is followed by chapters on periodical and book selection and ordering, cataloguing, subject headings, classification, pamphlets and pictures, maps and microfilms, rare books and the history of medicine, and reference works, including an annotated list.

The question of classification is always of interest, and the various methods now in use are adequately expounded. An over-elaborate classification hinders rather than helps the reader. The aim should be to provide a simple but efficient means of locating books or journals on a given subject. The chapter on rare books and the history of medicine has an appendix in which are listed bibliographies, biographies, and general histories, by localities and subjects—a very instructive and useful chapter. The final chapter, on works of reference, is interesting and informative, and gives an annotated list of reference books. To sum up, the whole material is excellent, and the editor and her colleagues deserve all praise for producing this long-wanted volume.

### Notes on Books

*The Unfit made Fit* (Longmans, Green and Co.; 1s.) is the fourth in a series of illustrated booklets produced by the British Council under the general title "Britain Advances," in which Dr. HAROLD BALME has written an up-to-date account of rehabilitation in the medical sense of the word. Modern methods and developments in this field are described in a way understandable to the general reader, and there are many good photographs illustrating the text.

As is intimated in its title, *Venereal Diseases*, by A. CAMERON EWING, in E. and S. Livingstone's Catechism Series consists mainly of question and answer. The questions are for the most part well chosen and the answers accurate and sufficiently full for the student or general practitioner. There are a few points which call for criticism: (1) The uninitiated might think from para. 4 of page 26 that congenital syphilis could arise from an infected father without the mother having suffered from the disease. (2) The section on the Wassermann reaction is most inaccurate. Complement is not generally considered part of the haemolytic system, and in the account of the test proper no antigen (extract) is included. (3) Iodides are prescribed for early syphilis on page 43 and stated to be "probably of no use" on page 50. (4) More might have been said about false-positive serum reactions in suspected syphilis, and the same applies to the use of cultures in gonorrhoea, especially in tests of cure of the female. With the above reservations, this little book (price 1s. 6d.) can be confidently recommended; Major Ewing has had a very considerable experience of his subject and has made his points with care and lucidity.

*A New Conception of Keratoconjunctivitis Sicca (Keratitis Filiformis in Hypofunction of the Lachrymal Glands)*, by HENRIK SJÖGREN, is published in Sydney at 25s. by the Australasian Medical Publishing Company. In 1933 Sjögren in a supplement to the *Acta Ophthalmologica* (Supplement II) gave an excellent survey of the scattered ophthalmic and general literature on the association of unusual conjunctival and corneal reactions with xerostomia and polyarthritis. This material, together with his own clinical and histological observations, fully established keratoconjunctivitis sicca as an independent and by no means rare clinical entity. Sjögren and others have since expanded our knowledge of the syndrome, which is now generally known after him, and the fullest account available in English was contributed by Sjögren in 1940 to Ridley

and Sorsby's *Modern Trends in Ophthalmology*. Dr. J. Bruce Hamilton of Hobart, Tasmania, rightly considered Sjögren's monograph, published in German, to be worthy of an English translation, and he has carried out his task well. The numerous photomicrographs have been well reproduced, though they lack the sharp definition seen in the original publication. The selected list of references given by Dr. Hamilton in a foreword and his own postscript help materially to bring the monograph up to date.

*A Mixed Bag: Recollections and Reflections of a Surgeon*, by W. BERNARD SECRETAN, M.B., F.R.C.S., is an unpretentious account of the busy and happy life of one who settled in Reading as a partner in general practice, became specially interested in surgery, and eventually devoted himself entirely to it. The author was attached to the Royal Berkshire Hospital and shows a justifiable pride in his recollections of it, for during his time the hospital developed greatly in size and in scope. Mr. Secretan's social interests have also been wide and his recreations have ranged from hunting to sketching, not forgetting motoring, in the earlier stages of which he took a very active part. The book is well illustrated by photographs, several of which were taken in various parts of the world when the author, soon after qualification, made two extensive voyages as ship surgeon—a course which he cordially recommends to young doctors before they settle down in practice. The book will be of considerable interest to the author's many friends, and it can be recommended to any who would like to follow the developments of medical practice during the past forty years. It is published at Reading by the Crown Press, Caxton Street, at 6s.

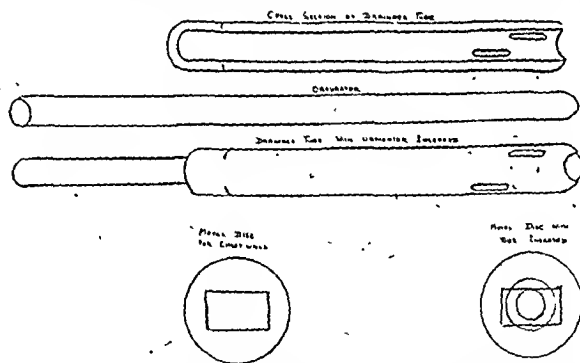
## Preparations and Appliances

### AN INTERCOSTAL DRAIN

Dr. JAMES PHILP writes from the Mayday Hospital, Thornton Heath:

The type of intercostal drain described and illustrated below has been designed by Mr. Peter Ayres of St. Mary's Hospital and used with success.

It consists of an intercostal tube fitted with an obturator. The tube is bevelled off at one end in order to form a complete curve with the end of the obturator, and is held in position by a metal disk which lies against the chest wall. The disk has a rectangular aperture in the centre, through which the tube passes, two sides of the aperture fitting into slots in the tube,



which pass into, but not through, the tube wall and therefore do not occlude the lumen of the tube. The disk is held in position on the chest wall by two small strips of elastoplast.

The advantages of this tube appear to be: (1) With the obturator in position, a rounded end is formed which facilitates introduction. (2) Should the tube become blocked, it can easily be cleared by inserting the obturator. (3) The disk holds the tube securely and obviates the possibility of its slipping out of position; it has also been found to be more comfortable than the usual method of securing by a safety-pin.

Mr. Ayres would like to thank Mr. F. Swinton, M.D., F.R.C.S., medical superintendent of Mayday Hospital, Croydon, for his help and advice; also Messrs. Down Bros., who make the tube.

Burroughs Wellcome and Co. have published an annotated review of the properties and uses of pethidine hydrochloride, the synthetic analgesic and antispasmodic drug, which has recently been the subject of extensive clinical studies. Copies of this pamphlet are available to members of the medical and allied professions on application to Burroughs Wellcome and Co., 12, Red Lion Square, London, W.C.1.

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## CHEMOTHERAPY AND PNEUMONIA

The successful clinical trials with sulphapyridine in the treatment of lobar pneumonia reported by Evans and Gaisford<sup>1</sup> were followed by confirmatory reports from workers in different parts of the world. In their original work Evans and Gaisford observed a case mortality of 27% in a hundred cases of lobar pneumonia of mixed type, against 27% in an equal number of controls, of similar age and sex, given non-specific treatment. In a later paper Gaisford<sup>2</sup> reported a fatality rate of 6.5% in a hospital which in the preceding years had had a rate of 22%. Although lower case mortalities than these have been recorded by some observers, the available evidence suggests that as a result of the introduction of chemotherapy the case fatality rates of cases treated in hospital have been reduced to about a third of the previous level. The simplicity of administration of sulphonamide drugs suggests that just as favourable results could be obtained at home as in hospital. That this can be achieved was demonstrated by Rosenthal, MacCall, and Pratt,<sup>3</sup> who found a case fatality rate of 3.8% in 132 cases treated at home with sulphathiazole. These sensational results in the control of pneumonia have tended to overshadow the importance of this disease, which still remains a major problem in public health: over 76,000 deaths were attributed to this cause during 1940-2 in England and Wales. The effect of the new therapy on the mortality of the whole population cannot be precisely determined. The lack of knowledge of the number of cases and the fluctuating trend of the disease permits of only an approximation of the improvement, which W. J. Martin<sup>4</sup> estimated to be of the order of 10%—considerably below that found in hospital experience. A possible explanation is that the age constitution of hospital patients is different from the general population. T. Anderson<sup>5</sup> produced evidence that sulphonamides are less effective at the extremes of life. He showed, from the notifications and deaths of the City of Glasgow, that the improvement under 1 year of age and at ages 45 and over was considerably less than at other ages, and the poorer results obtained at the extremes of life masked the large improvement in the middle age groups. The ratio of deaths to notifications for 1939-41 as a percentage of 1922-38 was 70.5 for all ages, while for ages 1-10, 10-20, 20-45 it was 46.2, 35.3, and 42.3.

It is very difficult to obtain extensive and reliable morbidity data in Britain, but in the United States the position appears to be somewhat easier. Ungerleider, Steinhaus, and Gubner,<sup>6</sup> making use of the records of the Equitable Life

Assurance Society of the United States, have examined the present trend of pneumonia compared with that of the recent pre-sulphonamide period. Their data consisted of the records of the employees of large industrial organizations who were insured for health and life under a group policy. These numbered over 100,000 and covered the period of working life; 62% were in the age groups 25-44. The incidence of pneumonia had increased during the later part of the period covered, from 2.52 per 1,000 in 1937 to 3.18 in 1941. The mortality was 54.7 per 100,000 during 1935-8 and 11.9 for the period 1939 to June, 1942. This fall was very much larger than in the general population; the death rate in New York City declined by less than 50% from 83 in 1935-8 to 45.3 in 1940-1. The more favourable age constitution of the industrial group, which excluded the very young and old ages, was responsible for the difference. The measure of benefit resulting from chemotherapy was larger than the death rates indicated, since the case mortality among the industrial workers fell from 20.8% in the first period to 3.9% in the second. Not only has mortality been reduced but the course of the disease has also been shortened by the modern treatment: during the first period the average duration of non-fatal pneumonia illness was 43 days, and during the second 36 days.

## HYGIENE, MORALE, AND DESERT VICTORY

The conditions that obtained in the Western Desert were so local and exceptional that much of the knowledge that can be distilled from the experiences of the Eighth Army therein cannot be applied directly in plans for military enterprises elsewhere. Nevertheless the Middle East campaign, and especially the Battle of El Alamein, are well worthy of deep study by military scholars, and offer much of real value to such as are concerned with or interested in military medicine. To the latter the thoughtful article by Lieut.-Col. H. S. Gear appearing in this issue will serve as a useful introduction, for in it most of the hygiene lessons are clearly displayed.

The fluctuating excursions of the Eighth Army and the Afrika Korps to and fro across Cyrenaica had ended in the summer of 1942 on the Alamein line. The Eighth at this time was composed of pitiless men soaked in war, fully trained and experienced, but dispirited. To it this rhythmical rushing forwards and backwards seemed to contain no promise of finality. It was no longer a European but a Desert Army, with its own cultivated and characteristic attitudes and habits. It was an Imperial and not a British Army, and partly for this reason was the finest and most finished instrument of war thus far fashioned by the Allies. Because of its peculiar constitution and unusual experience it needed an exceptional commander if its qualities were to be most advantageously exercised. For this position General Montgomery was chosen. In him this somewhat arrogant and truculent amalgam of Imperial types secured exactly what it needed. Here was an outstanding student of military affairs with a long and sound record, an ascetic flamboyant martinet, an eager fighter with a fierce faith in himself. Strongly reinforced and abundantly equipped with guns and aircraft from

home and with aircraft and tanks from America, the Eighth quickly accepted its picturesque and unconventional General and came to share his opinion that it was an independent and invincible formation engaged in a more or less private crusade. These are matters of great medical interest, since it is a well-established fact that there is an inverse relation between the level of the morale and of the training and experience of a formation on the one hand and the incidence of sickness and of battle casualties on the other. Much sickness derives directly from low morale, for disability is commonly nothing more than depicted disinclination. The unspoiled desert is a healthy environment, but like all others it can quickly be transformed into a disease-breeding cesspit if occupied by great numbers of human beings untrained in the techniques of establishing between themselves and its novel and ungentle conditions a harmonious relationship. Men experienced in combat are less likely to become casualties than are the raw and uninoculated.

The incidence of sickness among the veterans of the Eighth at this time was remarkably low, as was to be expected, for they felt themselves dedicated to a high purpose; they had faith in themselves and in their leader. The self-reliance of those loose-limbed sun-tanned youths, evoked so skilfully, endowed them with an eager positive desire to be healthy; and healthy they were. Moreover, they had, during the previous two years, become "salted," adapted, and now were able to flourish biologically under the conditions of desert warfare. Not so the reinforcements, for, complete as their education and training had been, they had yet to face the supreme test. They still needed time to make psychological and physiological adjustments. Nevertheless, even among them the incidence of sickness was low, for they were carefully tended by the Medical Services; they knew that they stood on the threshold of great adventure, and that they were being sympathetically watched by an astonishing man who had invited and gained their staunch allegiance and had raised them into a partnership with himself. This low incidence of sickness could have served as a true measure of the prospects of victory. It is among the disinterested, the disillusioned, and the already defeated that sickness rages.

The tactical and medical problems at Alamein differed from those of all other battles on the Western Desert. Here the Wavell plan of striking at the flank on the coast and encircling the other ending on the desert could not be adopted; the enemy line had to be breached by a frontal attack. Furthermore, ideas concerning the combined and integrated action of Air Force and Army and the tactical use of armour had been evolving rapidly, and at Alamein the latest were tested. The forces engaged were numerically more or less equal, but the Eighth was the better equipped. Rommel—General Montgomery's self-chosen personal adversary—was absent, and his deputy was completely deceived concerning our intentions and overwhelmed by General Montgomery's resourcefulness and quick thinking. Montgomery struck at night with guns, aircraft, and infantry. Night after night the breach in the enemy's line was widened and deepened until it was complete. Through it the armour passed far out behind

the enemy infantry, to spread panic among these and to force the enemy armour to give battle. Rommel, returning post-haste, was left with no alternative other than to pull out remnants of his armour and his best mobile units and to race back across Cyrenaica, leaving all the rest behind. The Eighth, always close on his heels, reached El Agheila inside three weeks. It was during this chase that our troops became exposed to grave danger, against which only the Medical Services could hope to protect them. The countryside had been thickly populated with Germans, Italians, and Arabs, and was now rank with pollution. It is understandable that a fast-retreating and defeated army cannot bury its dead. But it is always surprising to find that German soldiery fouls its own nest with a thoroughness that is truly Teutonic. Food scraps abounded everywhere, and so it was that flies in their millions pervaded everything. From these and similar perils the Eighth was safeguarded in the manner described by Col. Gear, and there is much strength in the argument that differences in the quality of the Medical Services of the two armies and in the sanitary habits, personal and public, of our men and of the enemy respectively were largely responsible for the result of the Alamein battle and of the Middle East campaign.

#### TOXAEMIA OF PREGNANCY AND HYPERTENSIVE STATES

Golden, Dexter, and Weiss<sup>1</sup> again call attention to the fact that pregnancy toxæmia is often followed by permanent and progressive vascular and renal damage. Whereas in the past the resultant injury was thought to be chronic glomerular nephritis, workers in America, Germany, and Great Britain have in recent years repeatedly demonstrated that the most constant sequel is hypertension. Some have gone so far as to suggest that glomerular nephritis is never caused by pre-eclampsia and eclampsia, but Golden and his colleagues report that, in addition to hypertension, renal lesions do occur; these are generally nephrosclerosis or chronic vascular nephritis, but a condition indistinguishable from chronic glomerular nephritis is sometimes found. About 25% of women who develop pre-eclampsia or eclampsia are left with permanent vascular disease. Indeed Browne and Dodds,<sup>2</sup> taking an unusually strict standard for normal, put the figure as high as 50%. Toxaemia complicates 6 to 9% of all pregnancies, so that two out of every hundred women who begin pregnancy with a normal blood pressure and renal function develop permanent hypertension. Once a pregnancy complicated by toxæmia is terminated the blood pressure tends to fall and often returns to normal. In some cases, however, it never reaches the pre-pregnancy level, and in others it rises again after a latent period of months or years. The ultimate effect of the toxæmia cannot therefore be judged until one or two years have elapsed. Once established, the vascular disease tends to progress, and, indeed, may assume the form of malignant hypertension. Death from cerebral haemorrhage, cardiac or renal failure is the final outcome. Golden and his colleagues do not agree that an inherited predisposition to hypertension is a factor in the aetiology of pre-eclampsia and eclampsia.

The severity of the toxæmia bears no relation to the incidence of sequels; in fact, vascular damage occurs more frequently after pre-eclampsia than eclampsia. It is the

<sup>1</sup> *Arch. Intern. Med.*, 1943 72, 301.

<sup>2</sup> *J. Obstet. Gynaec. Brit., Emp.*, 1939, 46, 443.

duration of the toxæmia which chiefly determines its after-effects, and even the mildest toxæmia, if allowed to persist for longer than three weeks, is likely to prejudice the future health of the patient. The teaching of most obstetricians—that pregnancy should be terminated if the toxæmia does not clear up completely after three weeks' conservative treatment—is endorsed by Golden's observations. In the present state of knowledge induction of labour without undue delay, even when there is no immediate risk from the toxæmia, would appear to be the only feasible way of trying to prevent the late sequelæ of hypertension and nephrosclerosis.

### VACCINATION AGAINST SMALLPOX

The occurrence of smallpox in a Middlesex hospital is a reminder that only a small minority of us are resistant to this dreadful infection. At present rather less than half the infant population is being vaccinated, and, apart from certain medical and nursing staff and, since the war, men and women in the Services, revaccination is seldom done. As immunity after primary vaccination lasts only for 5 to 7 years, it follows that the bulk of the population is susceptible, so that when a smallpox scare occurs vaccination or revaccination on a wide scale becomes essential. Unfortunately, vaccination in these abnormal circumstances is not always carried out with the care it needs, and many of those who, because their vaccination did not "take," were regarded as immune are in fact still susceptible and are examples of inefficient vaccination. The proper procedure for effective vaccination has recently been set out fully and lucidly in a pamphlet for the instruction of Army medical officers.<sup>1</sup> This has been done because unfortunate incidents have occurred abroad, and too often men who were regarded as insusceptible have on revaccination shown normal "takes." Vaccine lymph after purification is stored at  $-10^{\circ}\text{C}$ . in single-dose capillary tubes, or in ampoules containing 25, 50, or 100 doses. When the lymph is issued the date of issue is written on the label as "date of manufacture," and this lymph can be used up to 14 days after issue if kept at a temperature of  $1^{\circ}$  to  $10^{\circ}\text{C}$ . If refrigeration is not available, the lymph must be used within 7 days of issue. In doing the test the site of inoculation should be cleaned with soap and water and then rubbed with ether or spirit; non-volatile antiseptics (e.g., iodine or mercuric chloride) must not be used. With the skin dry, the lymph is expelled from the capillary tube using a small rubber expeller (obtainable from Baird and Tatlock Ltd.) or the teat of a baby's feeding-bottle. If ampoules are being used for large-scale vaccination, sterilized and cooled Hagedorn needles are dipped in the lymph, 3 or 4 needles being used in rotation to allow proper cooling after sterilization. Scarification is done through the lymph or with the needle freshly dipped in it. Ordinarily a single linear scratch one-quarter inch long is sufficient. The incision is made slowly with the skin taut and only deep enough to cause a slight exudation of the serum without blood; otherwise the lymph may be washed away. In the presence of an outbreak of variola major three well-spaced incisions may be made to give a more solid immunity. It is important that the lymph be allowed to dry before the application of a dressing of sterile, but not antiseptic, gauze kept in place by adhesive strapping. The vaccinated arm should preferably be rested in a sling and should be examined after 2, 4, and 7 days. Three types of reaction are recognized: (1) immediate, where immunity is high, characterized by redness or papules within 8 to 72 hours and fading quickly; (2) vaccinoid or accelerated, where some immunity exists, and the reaction (papules

plus vesicles) reaches its maximum in 3 to 5 days; and (3) the well-known primary vaccinia where immunity is nil. If there is no response by the fourth or fifth day, and immunization is urgent, vaccination may be repeated on the fifth day. If three attempts fail with lymph that has successfully vaccinated others, then, and only then, should the individual be classed as insusceptible. A point that recent Scottish experience has established is that successful vaccination in the incubation period need not give absolute protection against the infection.

An objective test for assessing individual resistance to the smallpox virus would be of great help. An *in vitro* test has, in fact, been described by Nagler,<sup>2</sup> who found that potent vaccinia virus had the same property as influenza virus of agglutinating fowl red cells, and that this property could be neutralized by mixing the virus with antibody-containing serum from rabbit or human. Corroboration of this finding is needed. Meanwhile the practitioner would do well to refresh his memory on the clinical features of smallpox: the influenza-like onset, sometimes with prodromal rash (if petechial or haemorrhagic the outlook is grave); the centrifugal distribution of the rash, which can be properly appreciated only if the patient is completely stripped; and the inexorable march of the lesions in stages, not in crops, from papules through vesicles to pustules.

### HOW TO BREAK OFF ALCOHOL

Some interesting papers have appeared during the last few years<sup>3-5</sup> on a method of curing a taste for drink, and the results show that by its means a considerable number of confirmed heavy drinkers have abstained for periods varying from six months to five years. The number of patients treated was 1,042 by last year.<sup>5</sup> The method makes use of a conditioned reflex. The patient, who must be willing to be cured, attends for four to eight treatments, which may be given over a period of from seven to twenty-eight days. When he comes he is given his favourite drink to which a dose of emetine hydrochloride has been added. The dose is in the neighbourhood of one grain. This leads to nausea; and when this appears a further dose of emetine is injected which causes vomiting in two to eight minutes. By repeating this procedure several times on different occasions the patient then finds that he becomes nauseated and vomits when he takes a drink which does not contain emetine; and even the smell alone causes nausea.

In the first paper, written by W. L. Voegtlin, the treatment described was more complicated and consisted in an initial injection of emetine, pilocarpine, and ephedrine, which led to very violent vomiting. When nausea appeared "all types of liquor" were pressed upon the patient, together with draughts of warm water, which made vomiting easier. Apparently emetine is now used alone, though the details of treatment are not given in the later papers.<sup>4,5</sup> It is curious that emetine should be given by injection, since emetine causes vomiting by a direct local action on the stomach wall rather than by an action on the medullary centre; and it would be more logical to use apomorphine if a central emetic is necessary. Voegtlin, however, discarded apomorphine because its action was too short and because it made the patients sleepy. Possibly he used too small doses of emetine by mouth (from 0.5 to 1.0 gr.), for emetine by mouth should in theory be enough, without recourse to any injection. There has been a careful follow-up<sup>5</sup> of nearly all the patients, and out of the total of 1,042

<sup>2</sup> *Med. J. Austral.*, 1942, 1, 281.

<sup>3</sup> *Amer. J. med. Sci.*, 1940, 199, 802.

<sup>4</sup> *J. Amer. med. Ass.*, 1942, 120, 269.

<sup>5</sup> *Amer. J. med. Sci.*, 1942, 203, 525.



treated in 5½ years 86% abstained for six months and 76% for twelve months. About 60% abstained for three years; but after five years only 40% held off. The decline in the strength of the conditioned reflex is of course to be expected unless it is reinforced from time to time by a repetition of the treatment. Dr. H. Reese uses this method in Madison, Wis., on chronic alcoholics who appear in court and who wish to be cured; they are detained for thirty days. Reese regards it as the only effective method of treating alcoholics. They must, however, be willing.

### BLOOD GROUP FACTORS IN TISSUES AND BODY FLUIDS

For a long time it has been known that the specific antigenic substances of the ABO blood groups are not confined to the red blood cells. They are present in most tissues and body fluids—for example, in saliva, sweat, urine, digestive juices, milk, pericardial and pleural fluids, and in serum, but not in cerebrospinal fluid. They occur, too, in pathological conditions—in tumours and the fluids of hydroceles and ovarian cysts. It is thought that the A or B antigen in recipients' tissues and body fluids plays a large part in neutralizing anti-A or anti-B agglutinin in the plasma of universal-donor blood, while as a result of the interaction of antigen and antibody little or no anti-A or anti-B is found in pools of plasma or serum from donors of all the four blood groups. It has generally been considered that the blood-group antigens M and N occur only in the red cells, for several experienced workers have failed to detect them in tissues and body fluids, although their presence in malignant tumours has been reported, and Kosjakov and Tribulev in 1940 claimed to have found them in normal tissues. That the Rh antigen was similarly restricted to the red cells has been thought to account for the very damaging effects of maternal anti-Rh agglutinins on the red cells of her child in the production of haemolytic disease of the newborn, whereas antibodies of the ABO system reaching the foetus meet antigen not only in the red cells but also in tissues and body fluids.

A most important report of finding the M, N, and Rh antigens in tissues has been made recently by Boorman and Dodd<sup>1</sup>; they also found them in saliva, but in only small amount compared with the large quantities of A and B in saliva. They state that the Rh antigen is widely distributed in tissues, but is almost entirely absent from body fluids, perhaps because it is only slightly soluble in water. To explain the failure of the Rh antigen in foetal tissues to neutralize maternal anti-Rh and prevent haemolytic disease, Boorman and Dodd suggest that the absorption of agglutinins crossing the placenta from the maternal to the foetal circulation is effected by antigens in the body fluids and that tissue antigens play little, if any, part. Similarly, in the few cases in which the ABO system of groups may be the cause of haemolytic disease and the baby probably belongs to the "non-secretor" class, the maternal antibody is not neutralized because of the absence of antigen from the body fluids. Hartmann has shown that while the ABO antigens occur in the tissues of both secretors and non-secretors, and are present in alcohol- and water-soluble forms in secretors, they do not occur in water-soluble form in non-secretors and are therefore almost completely absent from their body fluids. Boorman and Dodd conclude that if the following two conditions are satisfied haemolytic disease of the newborn may result: (1) an incompatibility between the maternal serum and the foetal erythrocytes, and (2) an insufficiency of the corresponding antigen in the body fluids of the foetus.

If, as Boorman and Dodd's report of its presence in saliva suggests, the Rh antigen occurs in the body fluids, even in only small amounts, then its passage across the placenta from the foetal to the maternal circulations is easier to understand. How the Rh antigen, thought to be confined to the red cells, could get across the placenta has baffled everybody.

### OCCUPATIONAL THERAPY IN NEW ZEALAND

So successful is the front-line convalescent depot run by the New Zealanders in the South Pacific that 95% of battle, accident, and sickness casualties return to their units as Grade I fighting soldiers. This depot fills the dual role of reducing front-line wastage to a minimum and of tackling the problem of rehabilitation at its source. The depot promptly repairs, salvages, and rebuilds. Many of the staff worked at the remedial hospital at Rotorua, which treated military cases from all over New Zealand, and they have a wealth of practical knowledge. Each patient progresses through stages of exercise which are interesting in themselves and which help him to forget his ailment. No one has a chance to brood; he can walk, play, read, and learn something about gardening, bookkeeping, art metal work, or whatever interests him. Those who have undergone amputation get from occupational therapy an immediate training in some art or craft—a new interest and stimulus in life. This front-line depot is a highly successful experiment as a prelude to the wider facilities available at the newly built modern establishments in New Zealand for the treatment of all disabled soldiers.

### IRRESPONSIBLE JOURNALISM

In recent weeks medical organizations and practitioners have had a flood of inquiries, mainly from the North of England, as to the value of vitamin D in the treatment of arthritis. Most, if not all, of these inquiries can be attributed to an unsigned article published in a popular newspaper at the end of last year, in which high hopes of a cure by this treatment are held out to sufferers from arthritis. How much this article owes to an article printed in an American periodical a few weeks earlier is perhaps a matter for speculation, but there is no doubt as to informed American opinion on this kind of medical journalism in general, and on the treatment of arthritis with massive doses of vitamin D in particular. In a leading article in the *Journal of the American Medical Association*<sup>1</sup> irresponsible journalistic efforts of this nature are rightly and roundly condemned, and the treatment in question is put in its proper perspective with the following quotation from *New and Non-official Remedies, 1943* (Council on Pharmacy and Chemistry of the American Medical Association): "Clinical evidence does not warrant the claim that massive doses of vitamin D are of benefit in chronic arthritis. . . ." This view is doubtless shared by the majority of medical men in this country who have had wide experience in treating arthritis and of the diverse methods that have been advocated from time to time. The distasteful task of shattering the falsely raised hopes of chronic arthritics is one that might well be spared the already overburdened practitioner and official. It is, however, the disillusioned sufferer who is most in need of sympathy, but it is hard to see how these distressing incidents are to be avoided unless lay journalists writing on medical topics can be persuaded to be factual instead of sensational.

<sup>1</sup> *J. Path. Bact.*, 1943, 55, 329.

<sup>1</sup> *J. Amer. med. Ass.*, Nov. 27, 1943, p. 839.

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## DIETARY SURVEYS

## CONFERENCE OF THE NUTRITION SOCIETY

A whole-day conference was held last month at the London School of Hygiene and Tropical Medicine, to discuss budgetary and dietary surveys of families and individuals. The subject was introduced by Sir JOHN BOYD ORR, F.R.S. Since nutrition will be the most important factor during post-war reconstruction, the duty of the research worker must lie in supplying the facts upon which the legislator may base his action.

## How Much is Spent?

Mr. A. G. JONES of the Ministry of Food discussed the possibilities of finding out the adequacy of nutrition in the community by means of budgetary analysis. This method was based, he said, on the study of purchases and expenditure, and gave a comparatively rough indication of the dietary intake. The budgetary survey, moreover, yielded data relating to the family as a whole, rather than to the individual members of the house, who might receive more or less than their fair share of the food available. The housewife had first to provide a statement of the stocks of food in hand. She must then account over a stated period, usually one week, for all the food used, whether taken from stock, purchased, received as gifts, or grown on the allotment. Meals taken outside the house must be allowed for by reducing the estimate of the number of persons fed, at the rate of 5% of one person's total week for a midday meal, or 2% for other meals. A man having six midday meals out would thus count as only 70% of a man in the final division of the total weekly food intake by the number of persons in the family. Corrections in the opposite direction must be applied for meals given to visitors, or for food wasted or given to animals. Small items such as sweets, snacks, chipped potatoes, and drinks might be ignored. At the end of the week the stock of food in hand was again counted.

Certain difficulties in taking a fair random sample of the population for survey could not be overlooked. The compilation of the budget was laborious, and mothers with small children might decline to participate. Outside observation might also introduce unusual psychological factors. The housewife might feel on her mettle to provide good meals for her family and to avoid wasting food. In subdividing samples of the population according to income a complication arose on account of the different expenses which the "house-keeping money" was intended to cover in different families. There was urgent need for standardization in interpreting the results of surveys. In particular it was difficult to convert data relating to children into "man units," because the needs for the various nutrients were not related to the adult need in the same proportion. Thus the protein need of the growing child would be relatively greater than the carbohydrate need.

## How Much is Eaten?

Dr. E. R. BRANSBY, also of the Ministry of Food, said that dietary surveys might be related to units of different sizes. Thus a statistical study might be made of the food resources of a whole country. By this means Orr had recently estimated that to supply everybody in this country with proper nourishment meat production would have to be increased by 25% and milk production by 65%. Other surveys had been based on a more detailed examination of the food consumption of smaller groups, such as institutions and families, and of individuals. An important object of family surveys was to find the effect on food consumption of such factors as income and family size. Social class also seemed to influence the choice of food—e.g., in the greater consumption of milk by "professional" families than by working-class families enjoying the same incomes. Three types of study were generally employed. The "precise" method (developed in America by Atwater and first used in this country by Noel Paton in 1900) involved the weighing of items of food before they were eaten. It was so slow and laborious that it was difficult to obtain the co-operation of a properly selected random sample of the

population. The "logbook" method was much simpler, and had been used successfully for four years in the Wartime Food Survey. A record was kept of all food as bought, or a careful estimate was made of the amounts of food used as they were eaten. In the "questionnaire" method the informant was asked to record at one interview all her purchases over a previous period. In this method inaccuracies were almost certain to occur. A golden rule for all comprehensive dietary surveys was that food data should be recorded immediately either after purchase or before consumption. Data supplied from memory must be regarded with suspicion. There was, however, much scope for the development of short-cut techniques in dietary surveys. Estimates of the food as eaten might be made in homely measures, the housewives being provided with standard tablespoons and teaspoons, together with diagrams of pieces of food of different sizes. Plaster models of helpings of meat, vegetables, etc., would be even more useful if obtainable. In the statistical analysis of data an immense amount of time and labour might be saved by using punched cards, which were fed into an appropriate calculating machine.

The degree of accuracy of the results of dietary surveys was open to discussion. In 1937 McCance and Widdowson stated that by the use of tables of food composition individual food intakes of the various nutrients could be very accurately assessed. While this might be true for the average nutrient content of a number of diets, there was not enough experimental evidence for such a definite conclusion in regard to individual diets, in the estimation of which numerous sources of error must be recognized. A grading of the intake of each nutrient as good, fair, poor, or very poor was probably as much as might be expected. Statistics as to the influence of the number of families examined on the reliability of the data obtained were important in order to minimize the labour of conducting surveys. A recent calculation had shown that collection of data from 100 families yielded as much information as from 300 families.

## Housewives' Data

Mr. F. LE GROS CLARK of the Children's Nutrition Council next went into the question of the allocation of food within the family. He pointed out that when the supply of food was just enough for the adequate nutrition of the family when distributed in the best possible way, any faulty distribution must result in the malnutrition of the less-favoured members. Investigation of the distribution was made difficult by social prejudices. If housewives were asked for intimate details of their economy they usually became suspicious, and so far only minor attempts to solve the problem had been made. In any working-class family one suspected that the mother would be the worst-fed member.

Miss MARGARET GRANT of King's College of Household and Social Science reiterated the difficulties involved in dietary surveys, and in the comparison of the results of different workers. Her experience with students had shown that the proper recording of all dietary items was very laborious. A second portion of any dish might be refused in order to avoid the trouble of re-weighing, or the very conscientious student might accept unwanted second portions merely to counteract this tendency. The worker should have no official connexion with the people examined, since their conduct must not be influenced by desire to please, either to obtain favours or to avoid disciplinary action. Realization of the difficulties of obtaining accurate records from students, who had plenty of time to spare for the work, made Miss Grant sceptical of the value of data supplied by housewives, who were usually overworked without any additional responsibilities.

Miss D. E. HOLLINGSWORTH of the Ministry of Food mentioned the work of the Wartime Food Survey. During 1943 about 1,000 families had been visited each month, representing 3,000 individuals. Refusals to collaborate had mostly been from middle-class families. The problems investigated had included the effect of prices on the purchase of foodstuffs, the costs of nutrients when bought as different foodstuffs, the amount of vegetables available for purchase, particularly in Scotland, and the amounts of nutrients derived from rationed and unrationed foodstuffs respectively. In many instances spontaneous comments had been written by housewives on

the backs of their ration books, and these were given full consideration.

The value of the "questionary" method was defended by Miss M. W. COOPER of the Oxford Nutrition Survey. An intelligent visitor could obtain a wealth of information in the course of an hour's interview, with a careful inspection of the housekeeping budget and accounts. The agreement between the estimated expenditure and expenditure actually accounted for was much closer in lower- than in higher-income groups, presumably because a poor woman had to take greater care in spending her money. Dr. B. WOLF suggested that the value of nutritional surveys would be much increased if the previous health histories of the families concerned were collected.

### Large-scale Surveys

The organization of large-scale surveys was described by Mr. L. MOSS of the Wartime Social Survey, a social research unit working for Government Departments. He thought that, since nutrition was becoming accepted as an agreed national interest, research workers should not allow present shortcomings in accuracy to stop them from organizing large-scale surveys. The methods used must take due account of social factors, which might be as serious in their effect as biochemical factors. Over the last two years Dr. Gertrude Wagner and other workers of the Wartime Social Survey had participated in nutrition surveys which fell into three main types: (1) studies of the kinds of food eaten in different groups of the population, together with such questions as when and where meals were eaten; (2) studies of the consumption of particular food items such as oatmeal, potatoes, or milk; (3) studies of cooking habits or the methods used in preparing and cooking certain foods. The arrangements for large-scale surveys must be very carefully made. Since the nutrition expert could not exercise personal control over the collection of all information, he must give precise and detailed instructions for the collection of information. But before formulating his instructions he must have an adequate knowledge of the people who were to be the subject of the investigation, and it was here that the sociologist played his part. To obtain a fair degree of precision and detail in the material resulting from surveys the persons who actually collect the data must be well trained in social research. Some scientific training was also desirable, in order that they might understand exactly what kind of information was required by the nutrition expert. The recent survey on cooking habits was a good example of the need for collaboration between laboratory worker and sociologist, the former discovering the conditions essential for the preservation of nutrients, and the latter finding how far these applied in common practice.

If the results of surveys were to be put to national advantage the nutrition research worker must ensure that his material was representative of large groups. A useful device, employed by the Survey to find out for the Ministry of Food what items entered into the diets of civilians, was to stratify the subjects into groups according to employment, and to take random samples within these groups. Thus the population was divided into light and heavy factory workers, outdoor workers, clerical workers, and housewives. The amount of detailed work was large, and the mass of data might become overwhelming if handled by ordinary methods, but this difficulty might be overcome by mechanical tabulation.

### Questions of Accuracy

Prof. M. GREENWOOD, F.R.S., spoke on the statistical validity of methods used in budgetary and dietetic surveys. It was satisfactory that the most recent value of about 3,200 calories calculated from budgetary surveys for the energy requirement of an average man doing an average day's work was in excellent agreement with the figure worked out 30 years ago by means of direct calorimetry. By both methods the variation between individuals of the same weight and activity was about 12%. Budgetary surveys had indicated wide variations in the amounts and quality of food bought by different families, but the physiological and pathological effects of these differences could not be appraised without long and continuous observation. Mere determinations of the calorific intake of a community in a stable state of nutrition would do nothing more

than verify data which had already been verified *ad nauseam*, but the information obtained might be valuable in an unstable state of nutrition by allowing the rapid detection of disequilibrium. An experiment carried out at Millbank Penitentiary in 1822, and the experience of the Army at Kut-el-Amara in 1916, suggested that the critical level for a population compelled to do moderate manual work was not much below 2,600 cal. In 1924, and again later, the budgetary survey method was used to assess the calorific intakes of miners during economic distress. In each instance communities were found whose intake was dangerously near the critical level. The children of Durham miners' families, with an intake of only 2,830 cal. per man unit, were found by anthropometric examination to be below the average for the county.

Wing Cmdr. YATES suggested that in dietary surveys a wide field might first be covered with a low degree of accuracy, and after this preliminary orientation a small field could be studied with a higher degree of accuracy. Dr. JOHN YUDKIN mentioned a survey in which mothers and children in families which spent less than 7s. 3d. per person per week on food were found to be inferior in various ways to those in families spending more. Prof. J. R. MARRACK criticized the view that in large surveys errors would inevitably cancel out. This would not be true of systematic errors, such as that introduced by the refusal of certain types of housewife to collaborate.

### Family Spendings

"The Family Income and Variation of Expenditure on Food" was the subject of a paper by Prof. A. L. BOWLEY of the Oxford Institute of Statistics. He translated into mathematical terms the generalization which stated that, with increase in income the expenditure on primary needs increased absolutely, but diminished as a proportion of the income. Thus examination of a recent collection of budgets indicated that when the income per "man" was 209 to 239 pence per week the expenditure on food was 53%; when the income was 420 to 475 pence the expenditure on food was only 42%. In making these calculations allowance must be made for savings, and for the inclusion in the family of lodgers and of children old enough to contribute part of their earnings to the family income.

Dr. R. F. GEORGE suggested that "income recipient" was a better term than "earner," since persons receiving pensions, etc., were included. The period of one week was too short for surveys of expenditure, since there might be great variation from week to week. Items such as clothing and furniture occurred at irregular intervals. Meals taken at school and canteens complicated calculations of expenditure on food. The present disintegration of families introduced another difficulty. Domestic conditions after the war might possibly be so changed as to make all previous surveys have little more than historic interest.

Dr. CARADOG JONES of Liverpool University went into the relation between expenditure on food and on other items. "Cost of living" was related to expenditure rather than to income, and with families having the same income expenses might be high in this running into debt and low in those saving. A general tendency might be noticed to consider things that were customary as being necessities. On this standard an adequate diet was one which would support existence without too much absence from work. The percentage of the income spent on food, rent, and fuel decreased as the income rose. Thus in very poor homes, which incidentally contained the most children, 50.4, 25.8, and 11.8% of the total income was spent on these three items in the order given; in middle-class homes the proportion was 20.1, 10.8, and 5%. In compensation, expenditure on "miscellaneous" items was much greater in the rich than in poor homes, being 55.8% as compared with 7.5%. The cost of living was much greater in urban than in rural areas, but attempts to adjust pensions, etc., between town and country dwellers on this basis had often led to confusion.

Mr. C. MADGE emphasized the divergencies in expenditure on food that might occur in families with the same income. In a survey in Leeds in 1942 two sets of families of the same numbers and incomes were made up for comparison whose mean savings amounted to 4 and 14% of their incomes



respectively. In the first group 45% of the total income was spent on food, and in the second only 41%. The families with lesser savings also spent more on tobacco, and it was noteworthy that in other families with more than two children more money was usually spent by the father on beer and tobacco than was devoted to the upkeep of the additional children. It seemed desirable to educate certain sections of the community to buy more food. This particularly applied to elderly persons, who in the past had been expected both to work little and to eat little. With the rising average age in this country it might be necessary to encourage more vigour, and better feeding, in old age. Examinations at Peckham Health Centre had indicated another type of person, young in years but suffering from anaemia, and restrained and unenterprising in behaviour, who might benefit if persuaded to spend more money on food.

Mrs. FOWKE described a survey carried out on a group of adolescent boys whose individual appetites and preferences were spread over such a wide range that the caloric intakes varied from 2,000 to 4,185 cal., and the vitamin A intakes from less than 2,000 to about 9,000 i.u. daily. Dr. B. WOOLF criticized the adequacy of the B.M.A. standards for nutrition. He calculated that on the basis of these standards it would not be necessary, as urged by Orr, to increase the production of milk and of other protective foodstuffs, but that considerable reductions in all foods except wheat could be allowed. The monetary allowance for food, according to Beveridge, fell slightly short of the amount necessary for adequate nutrition, but the provision for clothing was so low as completely to upset the balance of the budget. Much of the money earmarked for food would inevitably be used for clothing.

#### "Nutrition Works"

Sir JOHN ORR, in concluding the proceedings, commented on the difficulties inherent in dietary surveys, and stressed the need for uniformity in the presentation and interpretation of results. His own experiments on giving extra milk and oranges to children had justified him in the belief that "when you apply nutrition, it works." The Government was committed to a scheme to improve the diet of this country to a level consistent with optimal health, though its plans might take years to complete. Sir John would hesitate to criticize those who in order to enliven drab lives diverted a few shillings which might be spent on food to buy beer or visit a cinema. We were living in a world of potential abundance. When the powers of war production were redirected to meet the requirements of a peaceful world, wages and the price of food should be adjusted so that all should enjoy not only the necessities of life but also some of the amenities.

#### VOLUNTARY HOSPITALS AND THE WHITE PAPER

Representatives of the 1,100 voluntary hospitals in Britain, at a conference in London on March 7 arranged by the British Hospitals Association, asked the Government to reconsider certain proposals in the White Paper on a National Health Service.

A resolution, proposed by Lord Southwood and carried unanimously, expressed sympathy with the Government's intention to secure a co-ordinated hospital and consultant service accessible to every member of the community regardless of income, but viewed with grave concern the administrative and finance proposals in the White Paper, and added: "The suggested administration does not constitute that partnership between local authorities and voluntary hospitals which has been the avowed intention of successive Ministers of Health, and which is an essential requisite to the effective participation of the voluntary hospitals, and therefore to the accomplishment and efficiency of the scheme, and does not—except partially in the case of Scotland—furnish a suitable organization. The financial proposals are inconsistent and unacceptable in that they afford part payment only to the voluntary hospitals for their services rendered under the scheme, while postulating that the financial gap thus caused must be filled by benefactions and other voluntary gifts. At the same time, by the offer of free service for all, they destroy the incentive of the public as a whole either to give or to contribute."

Sir Bernard Docker, chairman of the B.H.A., presided over the conference, and it was decided to send copies of the resolution to the Minister of Health and the Secretary of State for Scotland.

## Correspondence

### The Prisoner-of-War Mentality

SIR.—Major P. H. Newman's masterly article (Jan. 1, p. 8) is one which merits the widest possible publicity, and should be ingested, digested, and absorbed by every authority, organization, or person—official or non-official—likely to be concerned in moulding the future of returning prisoners-of-war. To further the gastro-intestinal analogy, Major Newman's presentation of his own observations on his comrades during a long and trying imprisonment is so "personal" and valuable that absorption should allow no subsequent excretion—there is no waste.

As one who has, shall we say, sampled this "valley of darkness"—and I believe it is but a sample compared with Major Newman's stretch—may I be permitted to make one or two observations of my own. Adopting his four stages: (I) In the breaking-in period the captive's physical lot is hardest, while his mental and moral anguish has been adequately described. From my own observations there quickly develops, during a varying period of semi-starvation, the outstanding mental reaction of prisoner-of-war life—namely, "food consciousness." He acquires a marked "food complex," a manifestation of self-preservation which will persist throughout the P.O.W. days and probably for some time after his ultimate release. Food, usually favourite dishes, is the main topic of conversation and of thought; and, yea, even invades one's fitful slumber. To be personal for a moment, I well remember dreaming on two consecutive nights of omelettes and treacle pudding—alas, but a dream, and rude was the awakening. Either was as obtainable as a slice of the moon.

Again, during Major Newman's second stage—the convalescent period—some fail to pull themselves together for a long time. Given equal conditions there begins a true test of the individual's fibre. In some the superficial veneer of "culture" is readily stripped, and a small proportion, even of the so-called officer class, degenerate, become spiteful, petty, dirty, even dishonest—"primitive." In this minority social behaviour disintegrates and "each man for himself" becomes the code. Happily, by far the majority stand up to it well, officer and man.

During III—the long period of boredom—my impression has been that sexual deprivation, as defined by Major Newman, is dwarfed or overshadowed in importance by the "food-fear complex," or, at least, that the latter is an equal runner-up. The one would appear to depend largely upon the other in that when the "food stakes" are comparatively good, then the "food consciousness" abates. The keen, almost pathetic, anticipation with which the prisoner awaits the life-saving Red Cross food parcel vies with his eagerness to receive mail from home. These two facts, indeed, share the honours as the high lights of his existence. To add to Major Newman's observations, it is astonishing, in my experience, how apparently absent is normal sexual desire and inclination. If the subject ever crops up at all, one has frequently heard it expressed, "I seem to have no urge at all." At least, one heard little or no sex talk, unusual in a one-sex community, living on top of each other. I knew of only one case of homosexuality in the camp, while masturbation seemed to be rare. Before capture the majority of prisoners have already experienced a varying period of action in which their physical and environmental conditions may be comparable with those of prison camp. Already, to some extent, the prisoner is hardened to sexual deprivation. He becomes "anaesthetized" in due course to separation and all it entails. A somewhat crude illustration is afforded by a question which on one occasion went from man to man round the camp. One was asked to make an immediate choice between three things: "a seven-course dinner," "a woman," or "a bottle of whisky." The subsequent analysis was heavily in favour of the last named—obvious "escapism." They were equally obtainable!

Finally, regarding Major Newman's fourth stage—the repatriation period—it is obvious from his excellent observations that the P.O.W. of long standing merits a long period of

psychological readjustment on his return home, and should be very compassionately handled. As Dr. Billings points out (Jan. 15, p. 90), our men and women in Japanese hands will ultimately return, a large proportion of them mentally and physically shattered as a result of experience far worse than those of the average prisoner-of-war in German or Italian hands. I agree with Dr. Billings that the magnificent and life-saving Red Cross organization, to whom the prisoner is anything but "written off," should be entrusted with this problem: they and they alone. I believe that any Government organization devised for this purpose, or any body savouring of authority or officialdom, would be psychologically wrong, and would immediately antagonize the returning prisoner-of-war in need of help.

Excellent as are Major Newman's outlined principles regarding the establishment of this organization, I feel that the formation of P.O.W. clubs, as such, is inadvisable. More than once has one heard expressed, "I never want to see anyone in this camp again," or, "Even my best friend [in the camp] gets on my nerves," etc. Not only does the P.O.W. want to bridge the gap in his life and make up for all he has lost, but he wants to forget. He will probably warmly welcome his best friend in his own home, but not, I feel, in any communal atmosphere. As Major Newman observes, advice, help, and treatment must be unobtrusive, sympathetic, skilled, and, above all, personal and individual; I suggest, preferably within the confines of, or centred from, his own home, where are concentrated all his longings, thoughts, and desires.—I am, etc.,

Sonning Common, Reading.

A. W. VAUGHAN ELEY.

### Nursery Schools and Classes for Young Children

SIR,—Referring to the letter of Dr. Janet Aitken (March 4, p. 335), I would support whole-heartedly the opinions expressed in paragraphs 2 (b) and (c)—that the responsible staff of nursery schools or classes should have had special training and experience in the handling of these children both from the mental and physical aspects, should have had a grounding in practical hygiene, and that there should be the closest co-operation with the various health services. At the same time it is an arguable point whether children can best be accommodated in nursery schools or classes. It should be possible to attain these ends in a nursery class just as well as in a nursery school. Nursery schools or classes should be within easy reach of the child's home, and if the principle of nursery schools is rigidly adhered to it may involve the establishment of small schools difficult to supervise from the health point of view. Furthermore, if the young child is placed in a nursery school, it will involve a change of school at the age of 3 years and an interruption of continuity, which is most undesirable.

Experience of nursery classes attached to infants' schools has shown that the right emphasis can be secured in such cases, and that it is by no means the case that the main interest is on education rather than on health.—I am, etc.,

A. A. E. NEWTH,

Senior Medical Officer,  
City of Nottingham Education Committee.

### Babies in Glass Cages

SIR,—I wonder if Prof. Parsons would be interested to know that I saw a series of small glass cubicles in the von Pirquet Hospital in Vienna ten years ago. I was told that these had been tried extensively and found to be useless because the babies became lonely, frightened, and lost weight when nursed in them. I never saw the cubicles in use because they had been abandoned when I was at the hospital. It appears that this idea is antiquated and possibly harmful if the opinion of the originators is to be trusted.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

### Fainting in Blood Donors

SIR,—Publication in your columns was recently made (Feb. 26) of a report to the Medical Research Council prepared by a subcommittee of the Blood Transfusion Research Committee. The report was intended "(1) to identify factors that may be associated with fainting during blood donation, with a view to their correction; (2) to determine the frequency of delayed faints." A total of 362 cases of fainting with a control group

of 335 were investigated in admirable detail at several centres in regard to sex, age, civil state, relation to food, menstruation, time of waiting, difficulties in bleeding, numbers of previous bleedings and faints, etc., and in 4,212 cases information was obtained as to the incidence of "delayed faints."

The observations made cover three and three-quarter pages of the *Journal*, are presented with clarity and precision, and are, as a statistical preparation, beyond reproach. The investigators found, or at any rate record, no significant difference between those who fainted and the controls, the only material point emerging from the careful series of conclusions drawn being that it would be better not to use people who faint as blood donors. *Parturient montes!*

We are all acquainted with the type of person who faints at vaccination or in church or at the sight of blood, and have little difficulty in arriving at a clinical assessment of their condition. The findings of the subcommittee would have been different had they offered any observations on the emotional stability of the contrasted groups; it might at any rate have given the report some practical value.—I am, etc.,

London, W.1.

JOSEPH GÉOGHEGAN.

### India's Population Problem

SIR,—Drs. Barrow, McCracken, and Culbert, in their letters, dwell upon that pessimistic gloomy outlook for the future of India which I evidently possess. Nothing could be further from the truth than this assumption, and I hereby relinquish all claim to the Deanly attribute of Gloom. Nor can one who has voluntarily spent a large part of his life in medical research in the Tropics of Africa be accused of pessimism. On the contrary, he reveals himself an optimist, not worldly wise perhaps, even a little misguided—going far afield to pursue the shadow, instead of remaining at home to collect the substance—but assuredly an optimist, and a pretty nearly incurable one at that.

Dr. Prem comments with a slight touch of asperity on the position of civilian doctors in India; according to his account it is not the larger numbers of Indian doctors, but the smaller numbers of British doctors there, who control all the highly paid key posts and frame the policy; they derive their instructions from Whitehall and "have the real power." What is this mysterious "power" of which he writes? Is anyone preventing him or his Indian colleagues from carrying out, among their own people, the duties for which they have been educated and for which they are qualified—namely, the treatment of the sick and the prevention of disease? Dr. Prem observes that my reference to the Atlantic Charter will make Indian readers of the *Journal*, and many others, very suspicious—a remark so cryptic that I feel quite unable to cope with it.

Industrialization of India is advocated by Dr. Prem as the solution. Dr. Barrow points out that India is producing only enough food to give 88% of its existing population a daily ration of 2,800 calories per head, even if none were exported and there were no maldistribution. Dr. Forrester notes that India has plenty of raw materials and that industrialization will come. He quotes the Hot Springs Conference report, Section II: "The real clue to the solution of the problems of agricultural over-population lies in industrialization . . . [it] is also necessary if we are to raise the general standard of living." This admits that agricultural overcrowding exists, and, by implication, that the standard of living is low. Dr. Marrack makes a useful contribution with reference to the bearings of the Hot Springs Conference report. Several writers mention increases of population in Western countries exceeding those recorded for India.

The case as stated by me is plain enough. It is that the population in India has long suffered, and suffers now, from great and fatal epidemics and from high maternal and child mortalities, which are largely preventable by modern methods. I have assumed that it will be the future aim of all Indian doctors to prevent these diseases. In that case, given the staff, materials, and financial means, they will succeed. As a result, the figures of increase of population in Western communities—none of which suffers from more than a mere fraction of the preventable diseases of India—will quickly be exceeded by the Indian figures; the problem of the maintenance of the population will then become acute in that country.

Dr. Barrow states that the birth rate in India is apparently declining, being 34.5 in 1934-8 as against 35 in 1921-30 and 38 in 1901-10. Dr. McCracken tends to agree with Doubleday that over-feeding checks increase of births. Dr. Forrester, who advocates industrialization, points out that urban populations are less fertile, and that industrialization will reduce the birth rate. If all this is true, good and well. But the employment of this line of argument by

those who profess to regard restriction of population as an undesirable thing does seem a little surprising. Dr. Forrester, in pointing out a series of matters which he states I have overlooked, gives as his No. 4: "Man is both consumer and producer. To-day in India 50% of all deaths are of children under 10. From another standpoint this means that a great proportion of the population never functions as fully efficient producers. Every lengthening of the span of life, if it is coupled with adequate nutritional intake, increases the producer period of a man's life." If Dr. Forrester had only added "and also increases the consumer and reproducer period of a man's life," he would have stated quite clearly what is a very substantial part of my case. It is exactly these increases, following automatically and swiftly upon the application of modern preventive methods, that I anticipate will give rise to the consequences of over-population.

Dr. Forrester refers to my "... uncompromising acceptance of the validity of the Malthusian doctrine." No one who has read my article will accept that description as a correct representation of what I wrote about the views of Malthus. The term "Malthusian" is rather overworked by many of those who have taken part in this correspondence, and a word may be said about it. There are few countries of which it can be affirmed that they hold exactly enough people. The majority are too full or too empty. Countries with a standard of living that is accepted as reasonable must augment the means of subsistence as rapidly as the population grows or else prevent increase of their numbers. If they do neither of these things, their standard of living must fall. Malthus recognized this simple truth, but by publishing it he evoked a controversy which has not yet died. Like "Capitalist" and "Communist" to-day, "Malthusian" became a handy term of abuse. There was even greater dialectical magic in "Malthusian" than in either of these two modern words. All who felt so disposed slung "Malthusian" at any who had the effrontery to believe it possible that the overcrowding of any place could ever occur. Debate by epithet had, of course, as much convenience in those days as it has now. It was acceptable to many, since it dispensed entirely with any need for the use of rational processes. As a substitute for the effort of thinking "Malthusian" acquired really amazing virtues.

But Malthus was not the first person to grasp one important fact—namely, that an acre of land is a measurable, finite thing, devoid of the well-known properties of an expanding suitcase. Unless a miracle happens, the acre of land which just supports a man and his wife will fail to support them at the same level of comfort when they are plus five children. Centuries before Malthus, Plato made shrewd comments upon this topic: yet even he did not claim any priority for his views on account of their then great novelty. Probably in those days his ideas were already well established in the traditional lore and were fully at the service of any person of average intelligence. In Plato's Laws the land allotted to each citizen of the proposed ideal State was to be preserved intact, not to be added to or subtracted from, not to be given away or sold. So long as it was properly used it should remain the possession of the owner and his descendants. But in order to make this possible the family of the successive owners was to be definitely limited, so that each generation should equal, or, at least, not exceed, in numbers the previous one; otherwise the whole system would break down, because the land would not support the extra population. Provision was therefore to be made in the State for the necessary official regulation of the size of families.

Referring to Malthus and Henry George, Dr. Forrester says, "But neither of these is to-day usually regarded as the greatest of economists or even of experts on population problems." The views of these two writers were briefly discussed in my article. As regards George, his principal remedy for economic ills was the taxation of land values. I do not know whether he is regarded as "the greatest of economists" or not. But it is hardly out of place to mention Martin Leake's statement that even now every acre of India has its value assessed each thirty years, so that a beginning at least has been made in this direction. The system of taxation of land values is in full force in many parts of Denmark, Australia, and New Zealand. These countries cannot be classed as backward with regard to health matters; in point of fact they all rank among the most advanced. Therefore, one cannot help believing that if an economic principle, whether recommended by George or anyone else, is considered good enough for such progressive countries as these, there is likely to be something of value in it from the health point of view.

When the devastating Indian epidemics of cholera, plague, kala-azar, malaria, and other diseases are eliminated, when the maternal and child mortalities are reduced to low rates, an enormous Indian population, which is now lost, will survive; Sir John Megaw and other authorities have long recognized this. Encouragement of early marriage with the production of large healthy families, if this can be achieved without detriment to the health of the mother, is a policy which can justly be advocated for a country with abundance of good land still available, but it may be, and indeed is likely to be, a dangerous one for already crowded countries. Restriction of some kind will become necessary; it may be brought about as a

result of education or social convection, or by other means. The methods which Dr. Stopes has so courageously sponsored for the relief of the individual poor mother in the overcrowded home may yet prove to have their most valuable application to the overcrowded State.

During the post-war period, in a medically progressive India, there is likely to be a race between a growing population and adequate provision for its maintenance. Experience shows that agrarian and industrial reforms are as a rule slowly effected, whereas medical reforms may be relatively rapidly made, especially in tropical lands. If medical reform takes place in India the other reforms will have to be on an unprecedented scale and also executed at great speed. Any administrators who achieve a reasonably good standard of living for the future population of India will deserve well of their country, and there is no one who will not wish them all success in the task.—I am, etc.,

School of Tropical Medicine, Liverpool.

D. B. BLACKLOCK.

### Publication of Anaesthetic Misadventures

SIR.—In Dr. J. Elam's letter (Feb. 19, p. 263) he puts forward a strong plea for publication of anaesthetic misadventures. Towards the end of his letter he hopes that by such publication "the general public, too, might then begin to understand their foolishness in not paying more attention to . . . anaesthesia." I think the folly of the public lies in not paying more for anaesthetic service.

He bemoans the fact that a surgeon of a county hospital states that "the anaesthetics are given by house-surgeons, many of whom have no previous experience." The general public would be much more distressed were they to realize this. Surely the house-surgeon can gain his experience under the guidance of the anaesthetist on the hospital staff. The blame lies with the surgeon who allows the inexperienced house-surgeon to administer the anaesthetic, unless he is prepared to accept full responsibility from beginning to end.

I would offer the following suggestions: (1) Educate the surgeons as to modern anaesthetic procedures and requirements. (2) Assure the general public that increasing safety and comfort in anaesthetic technique is available and that they should be prepared to pay for it. (3) Invite, say, the department of anaesthetics at Oxford to investigate all cases of anaesthetic misadventure reported to them, and that they publish their comment upon them. (4) Invite all anaesthetists to subscribe annually towards the cost of such investigations and reports.—I am, etc.,

Salisbury.

A. D. H. SIMPSON.

### Reform in Medical Education

SIR.—I agree with much of Mr. G. H. Colt's letter (Feb. 26, p. 307), but I think that his summary dismissal of the preliminary sciences is a serious mistake. Even so elementary a theorem as the parallelogram of forces is constantly disregarded by the orthopaedic surgeon (cf. Charnley, *Lancet*, Feb. 19, 1944), and Mr. Souttar made equally elementary physics the basis of his Bradshaw lecture (*Journal*, Dec. 11, 1943). Prof. Christie's Goulstonian lectures (*Journal*, Jan. 22 and 29, 1944) showed the influence of simple mechanics on emphysema, and the plain fact is that we have hardly begun to realize the importance of these fundamental sciences in our preoccupation with more flashy ideas. Doctors send patients for x-ray examination, etc., for gall-bladder disease or appendicitis (probably 95% of which could have been satisfactorily diagnosed by simple clinical examination), and think that they are practising scientific medicine. It is as if one became a scientist by using a spectroscope to see whether the grass was green or the sky blue. Not that I undervalue these wonderful new diagnostic aids—for even the spectroscopic examination of the sky has its uses—but for one who has been trained to use his mind and senses aright they are largely unnecessary. They are for the specialist, and the more the medical student is taught to do without them the better doctor he is likely to become. He should know of their existence, as he should also know about the existence of the various types of bacteria, but he need not know how to recognize them; and, as Mr. Colt suggests, most of his bacteriology can be cut out without serious loss. The same is true of his pathology (I

regret to say it), though he cannot know too much of the pathology of trauma and inflammation, microscopic as well as macroscopic. In the same way most of the anatomy of the blood vessels is quite unimportant. If an artery or vein is cut Nature will have to provide compensation, and as a general rule does, but a knowledge of the lymphatics and cutaneous nerves is most helpful. The physiology and hydrostatics of the circulation is of much greater value than the anatomical details. Muscles and their actions are tremendously important, together with the various traumata they suffer. Bones and fractures are simple compared with soft-tissue injuries, and after much inquiry I have not yet found anyone who knows anything useful about tenosynovitis, the most common of industrial diseases, and one of the most incapacitating.

And so one might go on, hacking down great forests of specialized information which are of little real value to the student. If these were removed there would be space and air for him to develop really scientific habits of observation, thought, deduction, and practice. He should be taught, as Mr. Colt says, to recognize the commoner diseases and trained to realize when he is looking at something he has not seen before. Then he should ferret it out in a book or turn to the specialist for help, or both. But he should learn to extract the most out of his clinical examination first of all. He will then begin to appreciate special tests and specialists at their true worth. All his teaching should be consciously related to the fundamental sciences such as mechanics, physics, and chemistry. Much more attention should be given to physical chemistry, which holds the clue to much that seems so mysterious, as Dr. Cooper's letter of Jan. 29 so interestingly suggested. Industry is applying it with striking results to many of the medical problems industrial processes create, and Dr. Mumford has shown us how it can revolutionize ointment bases. The whole of medicine seems ripe for reconsideration in the light of physicochemical knowledge. Through it we are likely to gain a much truer knowledge of health as well as of disease, and a clearer understanding of their difference. In view of the changing emphasis of medicine and the desire to make the doctor a health upholder rather than a health restorer, every student should know at least the elements of this science if he is to appreciate new knowledge or understand his patient and his treatment. We older ones ought to have the opportunity of learning more about it too. The same is true of nutrition and physical education.

A glance at comparative anatomy is desirable in order to place the human race firmly among the animals. Some spiritual education is also needed in order to place man equally firmly among the gods. Unfortunately the psychologists, who ought to be in charge of this department, seem so busy plumbng the depths of the Slough of Despond that they have overlooked the little wicket gate and lost track of the way of salvation. A doctor should certainly know about this, for many of his patients are as sick of mind and soul as they are of body. Then, too, we need some knowledge of sociology, even if we have to eschew a wider philosophy, in order to put our patient in right relation to his fellows and to remind us that he is a human being and not simply clinical material or an interesting (or boring) case. Last of all I think we should all profit by a study of the history of medicine to teach us the grace of humility and thankfulness, and to inspire us to carry on the torch so nobly handed down to us. If all the unessentials were ruthlessly cut out there would be ample time for the student to get a really useful knowledge of all these subjects and to realize their relevance to himself and his patient, as well as to one another. He would go out with a true education and a sound basis for further learning and experience, qualified to help his patient, able to know when he was out of his depth, knowing also where and how to get help when he needed it.

I need hardly add that it is the realization of my own deficiencies that has prompted me to make some suggestions as to how they could be avoided in others.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

SIR,—Your correspondent Mr. G. H. Colt (Feb. 26, p. 307) is worried at the continued growth of the knowledge required for the qualifying examinations, and one readily sympathizes with him. If his solution, however, were to be taken seriously

the results would be horrifying. Are the reports received from the pathologist to have no relation to clinical medicine, or to therapeutic intentions or results? Is the radiologist a superfluity?—hardly, when one meets physicians of some standing who seem barely aware that a radiograph is a series of two-dimensional shadows of three-dimensional differential opacities, the source of rays being not even a theoretical point source, and the shadows subject to innumerable distortions depending upon the limitations of technique required for a particular examination. Is the radiotherapist to be a pure clinician with no knowledge of the lethal properties of the weapon he is using (as the practitioner who, "playing" with cineradiography, burnt a hole in his radiographer's back, or the surgeon using radium with no real knowledge of its properties and blaming the radium for the dreadful mutilations which he sometimes produces)? Or is the radiotherapist to be a pure physicist, unversed in the realm of clinical medicine? Is the physician to be allowed to practise without an intimate understanding of the pathology underlying the conditions which he is treating? Is the psychiatrist to be a layman, equipped with the results of a glorified first-aid course, who is "interested in the human mind"? Horror of horrors!

No, the answer is as straightforward as it always has been. The curriculum for the qualifying examinations must contain all, but no more than, that which is necessary for every general practitioner (or home doctor) and specialist, so that the former has a practical and reliable basis upon which to start his work, and the latter a basis—equally practical—upon which to start moulding the intricacies of his particular art, and yet maintain a true perspective of his own work in relation to the broad field of medicine as a whole.—I am, etc.,

Pinner, Middlesex.

ANTHONY A. VICKERS.

### Co-operative Research

SIR.—As an attempt to decide on the relative merits of various methods of treatment in actinomycosis, one of the undersigned suggested that it should be possible to carry out an experiment designed to give statistically sound information on these points. A statistician, Dr. Mather (author of *Statistical Analysis in Biology*), was asked to discuss the project, and as a result of the combined discussion it emerged that treatment could profitably be varied from case to case until a "block" of at least 15 cases had been treated. If these (15) cases together with other similar blocks are subjected to analysis the information we seek should be available and the reliance to be placed on it known.

Unfortunately it falls to no single hospital to get so many patients suffering from actinomycosis as would enable results to be obtained quickly, and so it was thought that it would be a sound plan to ask other hospitals to co-operate. The hope is that several hospitals which have agreed to collaborate in the scheme will agree to treat individual cases in accordance with the statistical necessities of the scheme, so that each hospital, or two or more hospitals having fewer cases, will provide a "block" of treated patients.

The scheme will require mutual discussion so as to permit all views to be considered in the final design of the experiment, and it is hoped that such a discussion can be arranged and that hospital staffs will agree to co-operate, so that at the end of one or two years we shall be in no doubt of the relative value of iodine, sulphonamides, x rays, and probably of penicillin in the treatment of this condition. Apart from any other consideration such designed experiments are desirable in clinical medicine, and co-operation such as is suggested, although a new, is not an undesirable or impossible feature.—We are, etc.,

E. C. B. BUTLER.  
FRANK ELLIS.

London Hospital.

### Blood Picture after Mepacrine

SIR,—Owing to decreasing quinine stocks the use of atebria for treatment of malaria has increased considerably, and the following observations on the blood picture after administration of mepacrine may be of interest to readers in malarial zones.

During the past three months there was a notable increase in the number of patients admitted to the maternity section of this hospital suffering from symptoms of acute malaria with

subtertian parasites in the peripheral blood. A record was kept of the results of treatment of such cases by mepacrine administered in the doses officially recommended—namely, one tablet (0.1 g.) three times daily for five to seven days. Repeated blood films were taken from all cases under treatment from the date of admission to the date of discharge from hospital nine days after delivery, and it is hoped to analyse critically in the near future the data thus obtained. Certain preliminary observations, however, appear to be of sufficient importance to justify publication of this short note.

The following observations were made on pregnant women of various races and nationalities treated with 0.1 g. mepacrine three times daily. (1) Clinical symptoms were well controlled by administration of mepacrine, and as a rule no further attacks developed after five days' treatment. (2) In a few cases disappearance of clinical symptoms after treatment was accompanied by disappearance of trophozoites from the peripheral blood. (3) In a few other cases trophozoites were present in blood films after treatment though clinical symptoms had subsided. (4) In the majority of cases administration of mepacrine in the doses stated was followed by amelioration of clinical symptoms, but blood films contained abnormally large numbers of gametocytes (crescents)—about 30 to 40 per thick film—and these gametocytes remained in the peripheral blood up to nine days after delivery.

It is well known that crescents are rarely found in the peripheral blood in tropical countries, and this observation that crescents frequently appear in the peripheral blood in large numbers after administration of mepacrine would seem to be of some importance from the epidemiological aspect. It is possible, of course, that the crescents have been damaged by the atebirin and are incapable of development in the stomach of the mosquito, but this would have to be tested in a research laboratory. The effect of plasmoquin is being studied, and a detailed report on the entire investigation will be issued later.—I am, etc.,

Public Hospital, Georgetown, Demerara.

C. ROMITI.

### Phage for Dysentery

SIR,—May I, from my remote corner over-seas, enter the lists to champion the cause of the "Goddess Phage" (as one of my grateful tea-planter patients ecstatically dubbed it 13 years ago) and to give my support to Drs. A. Compton and E. N. Russell, whose contributions on this subject in the *Journal* of June 13, 1942, and June 19, 1943, respectively (as well as those of others of contrary opinion), I have read with great interest. Like Dr. Russell, I too have marvelled that bacteriophage has not been mentioned by Col. Fairley and Sir Philip Manson-Bahr in their papers on the treatment of bacillary dysentery. Other authorities in their textbooks have made only the barest reference to it, and even then stated that it is of no proven value, etc. In India similar controversy has raged from time to time on the same subject, and last year, in a personal communication, Napier of Calcutta surprised me by saying that he did not think that bacteriophage was "much use, although some still swear by it." He then referred to sulphaguanidine as the new marvel, with which he was then experimenting on its first introduction to India.

I was introduced to bacteriophage in 1929 by Lieut.-Col. J. Morison, I.M.S., who was then director of the Pasteur Institute, Shillong, Assam's capital. Col. Morison was a pioneer of phage therapy, and he was the first to perfect its manufacture on a large scale in Assam, if not in India. In my turn, I believe I was the first tea district medical officer, on the north bank of the Brahmaputra River at any rate, to use bacteriophage for the treatment of acute bacillary dysentery and cholera. Morison's critics prophesied that the bacteriophage "bubble" would burst in 5 years' time. Time marches on, and although he has long ago retired, bacteriophage still continues to be turned out, millions of ampoules are distributed to the public all over Assam annually, and its use in controlling cholera epidemics in the Province's numerous villages as well as for dysentery is famous. The Government of India would not continue to manufacture a useless commodity on a large and expensive scale just to perpetuate the memory of Morison's "whims" or "hobby" were it indeed the case. The needs of the Army have denied all medical specialties—such as the sulphonamides—to other concerns—like the tea industry, etc.—

almost completely. We in Assam have had a fairly adequate supply of sulphapyridine, which has been very welcome, but such is the scarcity of sulphaguanidine that I received the very first supply I have ever seen only two weeks ago.

I have therefore had to rely almost exclusively on bacteriophage since the war started, and, as of old, it has stood the test of time and my faith remains unshaken. I have, like anyone else, had dramatic successes with phage as well as with sulphapyridine. I have also had some sad failures. But the successes have enormously exceeded these failures, and I have dealt with nearly 8,000 cases of acute bacillary dysentery and cholera since first I used bacteriophage in 1929. My experience agrees with what Dr. Russell reports on the preponderance of failures among infants, as well as the reasons he gives for failures generally. I have also noted that the local (Assam) bacteriophage is much more successful than, say, d'Hérelle phage or phage manufactured by firms in Bengal. I cannot pretend to explain this apparent "parochial" selectivity of phage. Many European civilians in Assam have become "phage-minded," and it is a common thing for a box of bacteriophage to be included in the luggage of many of them when travelling, especially by train, "just in case" of trouble. "Calcutta tummy" is like "Guppy tummy." While quite a few cases are known to be due to giardiasis and respond to atebirin treatment, the visitor from up-country to Calcutta often succumbs to another severe form of enteritis, and bacteriophage taken at once as a first-aid measure has often definitely prevented serious trouble. This preventive action is the great attraction of bacteriophage as well as its complete harmlessness, whereas, as Dr. Compton points out in his answer to Cmdr. Wilson (Dec. 5, 1942, p. 676), sulphaguanidine cannot be administered with impunity to provide "preventive development" to the masses, be they troops in the front line or civilians. In many villages in Assam the distribution of phage is left quite safely to the head man. This could not be done with sulphonamides.

It would be interesting to learn what the Army figures are up to date as regards the results of sulphonamide and bacteriophage treatment of troops in Assam. Finally, as everyone who has had success with bacteriophage will have observed, the cardinal conditions essential to that success are correct diagnosis and early treatment, which, of course, as Dr. Russell says, apply in any condition "from a perforated gastric ulcer to a common cold." The greatest obstacle I have ever had to overcome was the persistence on the part of many of my assistants in giving other drugs along with the phage, in spite of repeated emphatic orders to desist. It took some of them a very long time to realize that phage, and phage only, was able to cure.—I am, etc.,

Assam  
EDMUND BURKE,  
Medical Officer, Mangaldai Medical Association.

### Infective Hepatitis

SIR,—In my letter on this subject (Jan. 22, p. 130) I quoted H. Eppinger's case of "a young girl who committed suicide while suffering from 'simple' jaundice" as the case on which Eppinger based his conception that the so-called catarrhal jaundice was due to a hepatitis. My attention has since been drawn to the fact that this statement was incorrect. The facts are that during the last war Eppinger had occasion to examine the livers of four soldiers with jaundice who died from their wounds. He found no duodenitis, no swelling or plugging of the bile ducts, but the microscopical signs of what he has called later on a serous interstitial hepatitis. The case quoted by me is an earlier case (1908), and, in fact, one of the few cases observed anatomically where a swelling of Vater's papilla was found which was so marked that a sound could not be passed through it into the duodenum.—I am, etc.,

London, W.1.

H. UCKO.

According to the *Munch. med. Wschr.* for Aug. 13, 1943, the Fishery Research Station in Bergen has been working on methods of extracting insulin from fish. It has been successful in extracting from the gall of the cod an insulin which is not below ordinary standards. It is calculated that when the technique of extraction is perfected the whole Norwegian requirement of insulin will be met from the Lofoten Isles.



## Obituary

A. D. GRIFFITH, M.B., F.R.C.S.

Mr. Arthur Donald Griffith, senior surgeon to the Royal Eye Hospital, Southwark, and ophthalmic surgeon and lecturer in ophthalmology to the Westminster Hospital, died on March 5.

He was born on Oct. 20, 1882, and studied medicine at King's College Hospital after winning the Sambrooke Exhibition and a junior scholarship at King's College. He qualified M.R.C.S., L.R.C.P. in 1905, graduated M.B., B.S.Lond. in 1907, and obtained the F.R.C.S. diploma in 1909 after serving in house posts at King's and as senior resident medical officer at the Royal Free Hospital. His next appointment was that of Sambrooke surgical registrar at King's. He became dean of the School of the Royal Eye Hospital, where he had been house-surgeon, and thenceforward devoted himself to ophthalmology. During the last war he served with the R.A.M.C.(T.) in Malta, Salonika, and Italy, being mentioned in dispatches and retiring with the rank of brevet major; he also received an Italian decoration. After his return to civil life Mr. Griffith was appointed to the visiting staff of the Westminster Hospital, did good work as consulting ophthalmic surgeon to the St. David's Home for Disabled Soldiers at Ealing, and spent much time and thought in the congenial task of developing the research and teaching facilities at the Royal Eye Hospital. He was the author of a number of papers on diseases of the eye and disorders of vision published in the *Transactions of the Ophthalmological Society* and elsewhere.

Prof. ARNOLD SORSBY writes:

Arthur Donald Griffith well-nigh epitomized the ideal physician. A broad humanity permeated his personal relations; and his scrupulousness determined his professional work. To his colleagues and assistants he was a sage counsellor to whom they invariably turned for advice and guidance. Always able to see beyond the immediate tangle, his assessment of difficult situations was at one and the same time balm and positive help. Scrupulousness combined with exquisite judgment made him not merely an outstanding but the outstanding figure in any team, even if his reticence made for his comparative obscurity. The same qualities showed themselves in his work as an ophthalmologist: his diagnoses were never sudden inspirations, but the inevitable logical deductions of a meticulous examination, whilst his operations were beautiful examples of effortless deliberation. Richly endowed with that talent that is born in the stream of life, his was essentially the genius that flowers in solitude. It was for this reason that so much of his activities was little known outside the circle of those who were privileged to work with him. It is only they who know how much of the spade-work on the use of radium and x-ray therapy in ophthalmology was done by him, and only his immediate collaborators can assess how much Griffith, in his 35 years' service at the Royal Eye Hospital, contributed to the maintenance of established standards, to the aboration of new levels of achievements, and to the formulation of new aspirations. At the Royal Eye Hospital, which is perpetuating a cherished memory by a lectureship in optics, he will be remembered as a gentle colleague, a superb ophthalmologist, and a formative force in the development of research facilities in ophthalmology. His colleagues feel that a quotation from Dante, whom he loved deeply and reverently, is an apt epitaph:

"In te misericordia, in te pietate  
in te magnificenza, in te s'aduna  
quantunque in creatura è di bontate."

It is 28 years (writes Dr. WANLESS DICKSON) since I first met Mr. A. D. Griffith. We all looked to him then for help and guidance. He inspired a depth of confidence and affection few have equalled. With the passing of the years these sentiments grew broader and deeper. There was never a truer friend than "Griff," and all who knew him loved him. His passing will be a grief to a great number of his friends and associates. All at the Westminster Hospital loved him. He was tender and sensitive of heart; the sorrows of others he made his own. He was a true lover of his fellow men; a lover of animals and flowers and all the beauties of life. He was a noble, great-hearted gentleman. The attributes of Mr. Griffith's character and the logical and analytical qualities of his mind were equally well portrayed in his professional work. In his specialty he was an artist of high order. He took painstaking care in all that he did, in both clinical and operative work: "that little extra" was never lacking. He was gentle, kindly, thorough, and considerate. Life did not defeat him; to the very end he was master of his own soul. Such was Arthur Donald Griffith as we knew him, and bitter indeed is our loss and that of our profession.

We have to record with much regret the death of Dr. J. H. YOLLAND, C.B.E., who had been a member of the B.M.A. since 1896. John Horatio Yolland was born in Wandsworth in 1863, the son of a clergyman who afterwards became vicar of Hoyalake. He was educated at University College, taking the M.R.C.S.Eng. and L.S.A. in 1885. He settled down in 1889 at Bromley Common, Kent, and carried on his practice there until his death on Jan. 24. For 30 years he was on the staff of the Bromley Cottage Hospital, and also public assistance medical officer and public vaccinator for No. 1A Bromley District. He was made a life member of the Red Cross and St. John Association, and became vice-president of the Kent Branch of the British Red Cross Society. In the last war he was chief staff officer of the Kent Voluntary Aid Detachment. He held the rank of lieutenant-col. in the R.A.M.C.V., and was secretary and treasurer of the Kent County War Fund. After the war he was awarded the C.B.E. The presentation of a cheque for £250 and a silver tray in 1919 was the county's gift in recognition of his services. He received the King George Jubilee Medal in 1935. The Yolland Shield is competed for annually by Kent V.A.D.s, and another shield was given in 1912 for competition at local elementary school sports. Dr. Yolland was one of the founders of the Bromley and Bickley Golf Club, the first in the district. He was a keen lawn tennis player, and a difficult opponent to beat at croquet. From 1899 until his death he was People's Warden at St. Luke's Church, Bromley Common, and treasurer of the Parochial Church Council. The jubilee of the completion of St. Luke's fell on the same day as Dr. and Mrs. Yolland celebrated their golden wedding. A special peal of bells was also rung on Dec. 18, 1943, when the doctor reached his 80th birthday. His popularity was shown by a gathering of 400 people at his funeral; after the cremation his ashes were buried (by special dispensation) in front of the church he loved. He leaves a widow and two sons; the younger has been associated with his father in practice since 1919.

By the death of Dr. JOHN BAIRD CUNNINGHAM Edinburgh has lost one of her most respected family practitioners. Though born and educated in London, he carried out his medical studies in Edinburgh. His course was interrupted by the death of his father, which compelled him to go into his business in London for a year or two; but he was then able to return to Edinburgh, complete his medical studies, and obtain his University degree in 1913. At first he practised in Wales, and he returned there after service with the R.A.M.C. during the last war. His liking for Edinburgh, however, brought him back to that city in 1921, and he settled in the Morningside district, where he carried on a large general practice in which his thoroughness and kindness earned the confidence and affection of his patients. For several years he struggled against chronic ill-health. He was predeceased by his wife, and he is survived by a son, and by a daughter who is practising medicine in Edinburgh.

Dr. ARTHUR STANLEY HERBERT, O.B.E., formerly chairman of the Kensington Division of the B.M.A. and a member of the Council of the International Society of Medical Hydrology, died at Richmond, Surrey, on March 3. He was born at Hertford on Oct. 3, 1867, and from Hertford Grammar School went to study medicine at Guy's Hospital in 1885. He took the M.B., B.S.Lond. (with honours in surgery) in 1891, and after two house appointments at Guy's obtained the M.D. in 1892. He was for a time resident medical officer at the Royal Mineral Water Hospital, Bath, and this was the beginning of a lifelong interest in balneology and physiotherapeutics. At the close of the last century he went to New Zealand and for 17 years held the post of Government balneologist to the Dominion. During the last war he served with the N.Z.M.C. as lieutenant-col. and principal medical officer of King George V Military Orthopaedic Hospital at Rotorua. Dr. Herbert returned to this country in 1919 and settled in practice in Kensington. He was the author of *Mineral Waters and Springs of New Zealand*, 1912; *Military Physical Orthopaedics*, 1918; and *The Hot Springs of New Zealand*, 1921.

We regret to announce the death of Dr. JOHN JAMES ARMITAGE of Salisbury, who had been honorary secretary and later chairman of the Salisbury Division of the B.M.A., and in 1931-2 president of the Wilts Branch. Born at Cheltenham in 1875 son of the Rev. Arthur Armitage of Breckenbrough, he was educated at Cheltenham College and St. Thomas's Hospital, qualifying M.R.C.S. and L.R.C.P. in 1903. He obtained the M.R.C.O.G. diploma in 1938. Dr. Armitage practised in partnership at Salisbury for many years. He had been honorary assistant surgeon and medical officer to the V.D. department of Salisbury Infirmary, medical officer to the skin department, and surgeon to the maternity department, and on his retirement became consulting surgeon. He was also consulting obstetrician for the Wilts, Hants, and Dorset County Councils.

## Universities and Colleges

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

#### THE DUKE OF GLOUCESTER AN HONORARY FELLOW

On March 8 the King and the Duke of Gloucester lunched with the Council of the Royal College of Surgeons at the College in Lincoln's Inn Fields. The occasion was the admission of the Duke of Gloucester to the Honorary Fellowship, and His Majesty attended in his capacity as Visitor of the College. Mr S. M. Bruce, High Commissioner for Australia, was also among those present. After luncheon the King and the Duke of Gloucester inspected the damage done to the College by enemy action and the steps now being taken towards restoration.

The President, Sir Alfred Webb-Johnson, recalled the names of members of the Royal Family who had honoured the College by accepting Honorary Fellowship; their association with the College was greatly prized and appreciated by all its Fellows and Members. Addressing the Duke of Gloucester he said that they were particularly pleased that he should visit the College before departing for Australia because they had very close associations with the Royal Australasian College of Surgeons. Its ceremonial mace was a gift from the Council of the English College, and the portrait of Lister hanging in its hall was also a present from this country; its buildings were opened in 1935 by Sir Holburt Waring, at that time P.R.C.S. Its Immediate Past President, Sir Hugh Devine, was made an Honorary F.R.C.S. in 1939, but had not been able to visit this country since his election, and the President asked His Royal Highness to hand him the diploma.

The senior Vice-President, Mr. H. S. Souttar, presented the Duke for admission as an Honorary Fellow, and the Duke in reply to the President's welcome expressed his sense of the honour paid him by the Council in enrolling him in the presence of the King. He would carry his new title proudly to Australia, and looked forward to an early opportunity there of presenting his diploma, on behalf of the Council, to Sir Hugh Devine. Conferment of the Honorary Fellowship gave him, he said, "an association with this distinguished College which I am proud to possess, and when I eventually return from the office to which His Majesty has been pleased to appoint me I shall hope for another opportunity of meeting you all again."

#### COUNCIL MEETING

An ordinary meeting of the Council of the College was held on March 9, with Sir Alfred Webb-Johnson, President, in the chair. Prof. W. E. Gye, F.R.S., was appointed Imperial Cancer Research Fund Lecturer for the year 1944. A legacy of £1,000 from the late T. P. Legg was reported. The Council expressed thanks to the President for a number of gifts, including a portrait of H.M. the King, and also to Lady Webb-Johnson for her gift of a portrait of the President.

Diplomas were granted, jointly with the Royal College of Physicians, as follows:

**DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY**—H. F. Cheadle, P. J. Devlin; C. J. Evans, J. C. Greenwood, A. Hirsten, A. Hollingsworth, Lettice M. Hughes, P. Jardine, R. L. Kerr, Monica Low, H. F. Melhuish, F. R. Neubert, R. E. Paeker, C. L. D. J. Schepers, A. S. Scott, Elizabeth D. L. Simpson, H. Treisman.

**DIPLOMA IN MEDICAL RADIOLOGY**—D. T. Burke, O. Englander, Karel Mendl, M. Sheehan, E. W. Spencer.

## The Services

Surg. Lieut.-Cmdr. J. D. Lendrum and Temp. Surg. Lieut. J. P. W. Grant, R.N.V.R., have been mentioned in dispatches for services during the action in which the *Scharnhorst* was engaged and sunk.

#### CASUALTIES IN THE MEDICAL SERVICES

*Prisoners of war*.—War Subs. Capt. M. H. Churchill, Capt. J. Hendry, War Subs. Capt. P. MacArthur, R.A.M.C.

*Missing, presumed killed*.—Prob. Temp. Surg. Lieut. M. C. Cross, R.N.V.R.

*Killed in action*.—Lieut. A. Pearlman, R.A.M.C.

#### DEATHS IN THE SERVICES

Col. EDGAR HUNT CONDON, A.M.S.(ret.), who died at his home in Exmouth on Feb. 13, was born in India in 1868, educated at Westward Ho! and Aberdeen University, and joined the R.A.M.C. in 1893, going out to India the following year. He was on active service for the greater part of the South African War and then served in India for many years, being A.D.M.S. Northern Command during the last war. On retiring in 1921 he was for 10 years in private practice at Ivybridge, Devon, and finally settled in Exmouth, where he gave valuable service as honorary M.O. to the

Exmouth Dispensary, and took charge of the gas section at the first-aid post when war broke out. Col. Condon was an excellent all-round sportsman, having won many medals for swimming in his youth, played rugger for his university, and later played tennis, golf, badminton, and billiards with marked success both in India and England. He played tennis for Wales while stationed there from 1908 to 1913. His loss is deplored by a wide circle of friends.

## Medical Notes in Parliament

On March 7 Dr. Charles Hill addressed the Parliamentary Medical Group on the National Health Service scheme proposed by the Government. On March 9 Mr. Eden announced that two days during the next series of sittings of the House of Commons would be allotted to a debate on this scheme.

#### Mental Hospital Accommodation

On Feb. 24 Mr. JOSEPH HENDERSON asked the Minister of Health whether, with a view to reducing the high death rate from tuberculosis in mental hospitals, he would consider the desirability of securing high priority for building work in connexion with mental hospitals.

Mr. WILLINK regretted that it was impracticable under present conditions to give priority to the construction of new accommodation at mental hospitals. It was also impracticable to release during the war the accommodation taken over for the Emergency Hospital Scheme or for the use of the Forces. General conditions in mental hospitals, including ventilation and dietaries, were kept constantly under review in the interests of the health of the patients. The death rate in these hospitals, though it rose at the beginning of the war, had fallen considerably. The Ministry hoped for a fall in the tuberculosis rate.

#### A National Water Plan

When Mr. Willink, on Feb. 24, moved the second reading of the Anglesey County Council Water Bill, Mr. LEVY proposed that the House should decline to do so until legislation had been passed dealing with the national water resources. He said no local authority or combination of local authorities could provide the country with an adequate water supply and drainage system unless the subject were dealt with by the Government in a national water plan. There should be a national water board and also a regional control over each watershed area. Of all commodities the nation used, two had no standard of purity. One was water and the other was milk. Thousands of dairy farmers could not get a Grade A certificate for their milk because there was no water to wash the utensils or the cattle. The Government dared not have a purity standard for water, because then nearly all the service wells would be condemned and a number of urban supplies.

Mr. WILLINK, in reply, said he would study in detail what had been said. From his first day at the Ministry of Health he had applied his mind to water supply. He had promised to introduce a Bill covering sewage in addition to rural water supplies, and he would lay a White Paper. The Government was not content with the local or with the general arrangements for water supply. Let it not go out that the water supplies in this country were a disgrace. Ninety-five per cent. of the people had a piped supply. Typhoid deaths were the lowest in the world. He hoped to put the rural water proposals before the House before Easter.

Mr. Levy withdrew his opposition and the Anglesey Bill was read a second time.

#### Compulsory Notification of V.D.

On Feb. 29 Dr. SUMMERSKILL asked the Secretary of State for Scotland whether his attention had been drawn to the resolution passed by the conference of local health authorities in Scotland urging the Government to introduce legislation to provide for the compulsory notification and treatment of venereal disease; and what action he intended to take. Mr. JOHNSTON: Yes; I have also received a report from my Medical Advisory Committee, whom I asked last year to consider certain aspects of the problem of the control and treatment of venereal diseases. That report will shortly be published as a Command Paper. I am not in a position to indicate what consequential steps will be taken.

#### National Health in Tanganyika

A debate on conditions in Tanganyika Territory took place in the House of Lords on Feb. 29. Lord CHESHAM asked the Government what steps they proposed to implement the recommendations in the report made to the Governor of the Territory in May, 1940, and pointed out that millions of natives were now existing at a very low standard of subsistence. The soil, he said, was losing fertility through lack of knowledge of good

husbandry, and the natives were content to stagnate, living on what they could produce for their own needs from the soil. As a result their physical condition had suffered, and their mental development was suffering.

Lord FARINGDON said the matter was urgent. Probably the basic problem was water. In addition to the water and the climatic difficulties, there was an amount of dust which was exceedingly injurious to health during the dry season in the highlands. In the wet districts, mist and cloud also gave rise to respiratory troubles, particularly among Europeans. The Territory was cursed with the tsetse fly and the tick. The Commissioner for the Western Province reported, with regard to the health conditions of the natives, that it had come as a shock to observe the high percentage of recruits rejected by the military authorities. It was true that the medical tests for the Army were stringent, and that many of the recruits were not the best physical specimens that the tribes could produce; but even so, it was appalling to find such a high percentage of the population graded as C3. It was a conservative estimate to say that over 50% of the men examined were rejected for military service of any nature.

The DUKE OF DEVONSHIRE said that possibly Tanganyika had been the most handicapped of all the East African Territories by shortage of man-power due to the war. After the war the entire economy of Tanganyika would have to be considered in the light of the world demands for its primary products, and no man could say what they would be. It was not possible to lay down a policy for which, at present, they could assure full continuity. The question of water resources, a general survey of which was stopped by the shortage of man-power, was again under active consideration, and plans had quite recently been before the Colonial Development and Welfare Fund for the investigation of these supplies. The Government was most anxious to see a real move forward made in the development of this Territory.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* measles continued to rise with 176 more cases, but the incidence of pneumonia fell by 116, of scarlet fever by 115, and of dysentery by 43.

The largest increases in measles were in Norfolk by 110, and in Kent by 40. In contrast to the general trend, the notifications in Lancashire fell by 79. The four counties of Kent, Lancashire, London, and Norfolk, with over 200 cases each, accounted for 52% of the total incidence of this disease. A diminution in the trend of scarlet fever was fairly general throughout the country; in Warwickshire cases fell by 27, and in Middlesex by 26.

The lowered incidence of dysentery was due mainly to the fact that in London notifications fell from 61 to 14. There were fresh outbreaks during the week in Hertfordshire 16 (Bishop Stortford U.D. 14), and Herefordshire 22 (Kington U.D. 19). The other high returns were from Surrey 37 (Banstead U.D. 17, Carshalton U.D. 10), Shropshire (Wellington U.D.) 32, Lancashire 30 (Liverpool C.B. 12), Yorks West Riding 12, Essex 12, Devonshire 10.

In *Scotland* the incidence of measles rose by 49, acute primary pneumonia by 50, scarlet fever by 43, and whooping-cough by 30 notifications—the increases in Glasgow being 35, 25, 17, and 27 respectively. The notifications of diphtheria fell by 15, and of dysentery by 62. The latter disease is still at a high level; the largest returns were from the cities of Glasgow 16, Falkirk 14, Edinburgh 12.

In *Eire* notifications of measles rose by 79, 350 of the 403 cases being notified in Dublin C.B. The incidence of diphtheria fell by 54.

In *Northern Ireland* the largest returns for scarlet fever were from Belfast C.B., 33 out of the total of 55. Londonderry C.B. reported 12 of the 28 cases of diphtheria.

### Smallpox

Since last week 3, and possibly 4, fresh cases of smallpox have occurred; all the patients were known to be contacts and were under surveillance. One of the new cases is that of a patient at Mount Vernon Hospital, where the original cases occurred. Two, sisters of a fatal case already reported, are in Finchley. The fourth and doubtful case is in Paddington. No deaths have occurred since the 3 reported last week.

### Week Ending March 4

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,997, whooping-cough 1,914, diphtheria 681, measles 1,987, acute pneumonia 983, cerebrospinal fever 53, dysentery 218, smallpox 8, paratyphoid 4, typhoid 3. The deaths from influenza in the great towns numbered 50, showing a slight rise for the second consecutive week.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended Feb. 26.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	75	7	27	5	4	103	3	26	6	4
Deaths .. ..		1	3				1	2		
Diphtheria .. ..	690	26	173	104	28	813	44	225	126	40
Deaths .. ..	11	2		2	1	24	1	3	4	2
Dysentery .. ..	234	14	79			96	11	24	3	
Deaths .. ..										
Encephalitis lethargica, acute .. ..	2							1	1	
Deaths .. ..										
Erysipelas .. ..			46	10	8			76	3	6
Deaths .. ..										
Infective enteritis or diarrhoea under 2 years .. ..				8					10	
Deaths .. ..	60	10	12	12	6	45	7	6	16	4
Measles .. ..	1,796	239	196	403	1	20,882	1,361	448	8	74
Deaths .. ..	1			4		22	7	2		
Ophthalmia neonatorum .. ..	63	3	19	1	1	79	3	20	1	1
Deaths .. ..										
Paratyphoid fever .. ..	6	1				6			1	
Deaths .. ..										
Pneumonia, influenza* .. ..	858	61	15	2	6	1,373	57	26	16	7
Deaths (from influenza) .. ..	46	3	3	2	2	87	17	10		2
Pneumonia, primary .. ..			249	27				452	25	
Deaths .. ..		48		14	13		67		17	19
Polio-encephalitis, acute .. ..	1					2	1			
Deaths .. ..										
Polio-myelitis, acute .. ..	4			3		3		1	2	
Deaths .. ..										
Puerperal fever .. ..		1	13		1		2	13		
Deaths .. ..										
Puerperal pyrexia† .. ..	143	14	16	2		180	15	14	4	2
Deaths .. ..							1			
Relapsing fever .. ..										
Deaths .. ..										
Scarlet fever .. ..	1,948	117	259	19	55	1,934	133	288	46	65
Deaths .. ..						2		1		
Smallpox .. ..										
Deaths .. ..										
Typhoid fever .. ..	7			7	3	3		5	4	1
Deaths .. ..										
Typhus fever .. ..										
Deaths .. ..										
Whooping-cough .. ..	1,810	164	154	66	16	1,786	136	171	29	9
Deaths .. ..	14	1	2	2		11	2	3	3	1
Deaths (0-1 year) .. ..	437	60	61	51	21	422	51	73	63	23
Infant mortality rate (per 1,000 live births) .. ..										
Deaths (excluding still-births) .. ..	5,913	1,246	653	265	152	5,004	755	707	293	145
Annual death rate (per 1,000 persons living) .. ..			15.0	17.3	‡			15.9	19.3	‡
Live births .. ..	6,889	854	831	367	278	6,483	744	887	365	29
Annual rate per 1,000 persons living .. ..			16.9	24.0	‡			18.1	24.0	‡
Stillbirths .. ..	222	17	28			232	26	32		
Rate per 1,000 total births (including stillborn) .. ..			33					35		

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Medical News

The annual general meeting of the Biochemical Society will be held at the Courtauld Institute of Biochemistry, Middlesex Hospital, W.1, on Saturday, March 25, at 2.30 p.m.

The Association of Austrian Doctors in Great Britain will exhibit a medical film illustrating (1) blood transfusion, and (2) Red Army Medical Services, on Sunday, March 26, at 2.30 p.m. in the Hastings Hall, B.M.A. House, Tavistock Square. Invitation cards can be had from the hon. secretary, Association of Austrian Doctors, 14, Craven House, 121, Kingsway, W.C.2.

A reorganization of the Chinese Red Cross was effected last year by special action of the Supreme National Defence Council.

The Association of Military Surgeons of the United States has presented its Gorgas Award for 1943 to Dr. Hugh E. Cummins, retired Surgeon-General of the United States Health Service and at present director of the Pan-American Sanitary Bureau. The award was founded in 1942 by John Wyeth and Company of Philadelphia and consists of a medal and scroll and \$500. It is given each year to a member of the Association who has made "notable contributions to medical science" of value to the military service.

Dr. Bay Avni Aksel will give a lecture in Turkish on "The History of Medicine in Turkey" at the Londra Türk Halkevi (Turkish People's House), 14, Fitzhardinge Street, London, W.1, on Tuesday next, March 21, at 5.30 p.m. Sir Wyndham Deedes will translate the lecture.

The annual general meeting of the Institute of Hospital Almoners has been arranged for Friday, March 24, at 6 p.m., in the Caxton Hall, Westminster. The Minister of Health (Mr. Henry Willink) will attend and address the meeting.

The London Gazette has announced the appointment as O.B.E. (Civil Division) of Dr. R. E. Godel, senior physician of the Suez Canal Company Hospital, for services to the Army Medical Services.

The issue of the *Schweizerische medizinische Wochenschrift* for Sept. 24, 1943, was a special number in honour of the 60th birthday of Prof. Alfred Gigon, the senior editor and the founder of the Swiss Academy of Medical Sciences.

## Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Painful Spasms after Stroke

*Q.—A patient aged 79 is recovering from a recent stroke which caused mild hemiplegia. He complains much on account of muscular twitches in the limbs; the hamstrings contract in painful spasm, especially at night. Is this condition very uncommon? I have read no account of it. Is there any known treatment?*

*A.*—Detailed observation of the movements would be essential to establish their cause. The wording of the question suggests that the painful spasm may be due to degenerative changes in the extrapyramidal system, and that the patient is not suffering from a simple hemiplegia due to a lesion of the pyramidal tract. In support of this is the note that the stroke caused a mild hemiplegia. Ordinary flexor spasms, which are not usually painful, are commonly associated with more than a mild hemiplegia, although they are particularly likely to be noticed at night, when they awaken the patient. They are fired off by other movements or by stimulation of the foot. Involuntary movements of extrapyramidal origin, on the other hand, are usually quite spontaneous, are likely to have a writhing quality, and may be much more extensive or forceful than those of pyramidal

release. They range from the movements of chorea and Parkinsonism to the violent activity of hemiballismus. If this is in fact the cause, treatment at this age will be difficult, and will be confined to absence of stimulation—a warm tidy bed, sedatives and belladonna in as large doses as the patient will tolerate.

#### A Case of Low Blood Pressure

*Q.—Is there any satisfactory treatment for low blood pressure? The blood pressure of a male of 42 has been low for many years (110 mm. systolic at 26 years). Following exhausting work in 1942-3, this has now fallen to 100 mm.; and, despite prolonged rest, remains at that figure. Chief symptom—waking regularly at 3.30 a.m. (over a period of nine months) with a sensation of throbbing in the head and exhaustion, the latter persisting throughout the day. Hypnotics aggravate the exhaustion. Ephedrine and eucortin have been tried without benefit. Raising the head of the bed at night is not effective. The appetite is good and the normal amount of exercise is taken.*

*A.*—There is no indication for any treatment of the blood pressure in such a patient. Many healthy men with a systolic pressure of 100 mm. are capable of strenuous work and even hazardous war service such as flying. The symptoms described could not be due to the blood pressure, which, though lower than the average, is not too low to be normal. The whole condition as described suggests a psychoneurotic state, and investigation should be directed to this.

#### Pruritus Ani and Vulvae

*Q.—A woman in middle life suffers from intense irritation of the anus and vulva. There is no excoriation of the skin, no desquamation or redness of the parts, no threadworms or colitis. The complaint is worse at night, but often active during the day. Many things have been tried, including rectal wash-outs, ointments, and lotions. Suppositories (including morphine suppositories) have been tried. The patient is not a neurotic, and the general condition is good. What will bring relief?*

*Q.—An old lady of 83, healthy except for some arthritis, has suffered for years from pruritus of the anus and vulva. Various outside applications have given no relief. Might stilboestrol be tried in such a case, and, if so, what would be the appropriate dosage?*

*A.*—Exclude the following: other rectal or anal conditions, psychological factors such as marital unhappiness, an idiosyncrasy to aperients and other drugs, glycosuria (in first case), highly acid urine or urinary infection, trichomonas infection of the vagina, local skin disease. If the more common causes of this type are excluded and the usual local treatments have failed, then carry out a full examination of the blood and a fractional test meal. Hypochromic anaemia, with or without achlorhydria, is not uncommonly associated with "idiopathic" pruritus of the vulva, and, to a less extent, of the anus. If the findings are positive, the irritation should quickly disappear following the administration of ferrous sulphate and acid. Hydrochlor. dil., minims 10 t.d.s. Otherwise intensive treatment with vitamins A or B, and the local application of crude cod-liver oil should be tried. If all else fails a small dose of radium or x rays should be considered. In any case it is important to give hypnotics and local analgesic ointments at night to prevent the patient scratching during sleep.

Stilboestrol or other oestrogens are of value only in post-menopausal patients when the vulva and adjacent tissues are atrophic; it might be beneficial in the second case. A large dose will be necessary, so give stilboestrol 0.5 mg. or 1.0 mg. twice or three times daily by mouth. If it causes nausea or vomiting substitute oestrone 0.3 mg. to 1.0 mg. t.d.s. by mouth, and oestradiol benzoate 0.5 mg. intramuscularly twice weekly. Oestradiol and oestrone ointments can also be applied locally. The patient should be warned that such treatment may bring on uterine bleeding.

#### Weak Erection

*Q.—A patient aged 40, 3 children, has for no apparent reason suddenly developed difficulty in marital intercourse owing to weak erection. General health and habits excellent. Very fit man; no venereal disease; no excess of intercourse; no contraceptives used. The only positive finding is a varicocele of many years' standing. No psychological difficulties.*

*A.*—In spite of an apparent absence of psychological difficulties, the symptom is probably of psychological origin, and assuming that there are no abnormal physical signs, this aspect should be explored further. In the experience of the writer there is an apparent increased incidence of partial or complete impotence arising in males hitherto normal, and it is not unlikely that this is due to the strain and anxiety of present-day conditions. Quite apart from this, phases of relative impotence in otherwise normal men are much more common than is generally believed, and are associated with temporary psychological difficulties and excessive fatigue. In every case a complete history and examination are called for, to exclude neurological and endocrine disorders, but nevertheless these account only for a relatively small proportion of cases.

**Excessive Sweating**

**Q.**—A young R.A.F. officer suffers from excessive sweating under the arm-pits which ruins his tunic. Is there any remedy which can be easily applied to check this condition? The officer is quite fit and active.

**A.**—X-ray treatment should be avoided because it can only be effective when used to excess, with all the undesirable consequences of over-exposure. Temporary relief follows the application of a sponge wrung out in very hot water. Possibly one of the proprietary remedies in common use by women would be effective.

**Sex Function and Spondylitis**

**Q.**—A male aged 40 has fairly advanced spondylitis ankylopoietica, most of the lumbar, upper thoracic, and cervical vertebrae being affected. He complains of loss of sexual desire, but I find no reference to this aspect of the disease in any literature or monographs, and am wondering if spondylitis normally does affect the sex outlook, and if you could suggest any treatment that might increase sexual desire, if it is indicated in such a case.

**A.**—The possible association between the sexual organs and their functions in spondylitis ankylopoietica was referred to in an article in the *Journal* (July 3, 1943, p. 4), and I am not aware of any other observation on the subject. Probably clinical investigation is the only source from which light can be thrown on the problem, and it is one which deserves attention. Treatment by appropriate sex hormones would appear worthy of a trial, and any results, direct or indirect, should be published as a contribution to a difficult problem.

**Migraine with Deadened Extremities**

**Q.**—I would be glad to know if cure is possible in the case of a woman aged 42 who has had severe migraine since adolescence, accompanied by "deadening" of fingers and toes. On exposure to cold the fingers become white and dead. There is no evidence of arterial thickening or the permanent changes often seen in Raynaud's disease.

**A.**—Although the causes of migraine are still not known, the view has steadily gained ground that the essential abnormality is a disturbance of the autonomic control of the extracranial or intracranial blood vessels. The most favoured view associates the pain with dilatation of the pial and dural vessels, and explains the beneficial effect of ergotamine tartrate by the constriction of dural vessels which it produces. Another view ascribes the pain to vasoconstriction and explains its relief by ergotamine tartrate to the sympathetic paralysis produced by larger doses of the drug. The case described is more easily explicable along the latter lines. The interesting combination of migraine with "deadening" of the digits can perhaps be explained by assuming that the peripheral vessels in or on the nium and the extremities are alike abnormally sensitive to the action of adrenaline. The case is worthy of careful investigation. In the meantime treatment by the injection of ergotamine tartrate (0.25 to 0.5 mg.) at the very beginning of the attack should be tried. If this treatment succeeds, it would be worth while trying sublingual administration, thus avoiding the trouble of repeated injections.

**LETTERS, NOTES, ETC.****Thiouracil: A Warning**

**Dr. E. G. SLESINGER** (London, W.1) writes: The answer given under the above heading in the *Journal* of Feb. 26 (p. 313) conveys a sense of certainty and optimism not borne out by facts. Thiouracil will, it is true, reduce the basal metabolic rate to normal or below in most cases, and will therefore result in a gain in weight. Its effects on other symptoms are, however, variable. In many cases its administration leads to a marked fall in the percentage of polymorphonuclear cells in the white count, and several cases of agranulocytosis have already been noted. The statement that its administration "can be continued for many months and possibly for many years," without any warning of the need for frequent control white cell counts, is dangerous advice in the extreme. The action of thiouracil through the anterior pituitary is ignored by the writer, with the consequent occasional increase in the goitre. American opinion is gradually relegating thiouracil to a useful place as a method of pre-operative preparation. Possibly it may serve a valuable function in the medical treatment of certain types of case as well. Would it not be wise, however, to wait until controlled observations are available on enough cases before advising its general use in the light-hearted manner of your contributor and so possibly leading to unnecessary and avoidable disasters?

**Mastoiditis**

**Dr. H. HILTON BROWN** (Edinburgh) writes: I have been deeply interested in the correspondence on this subject. I do not believe that mastoiditis is ever present in the vast majority of the cases operated upon. This statement I make after having much experience of the operation, as I was clinical assistant to the late Dr. Logan

Turner in the ear, nose, and throat department of the Edinburgh Royal Infirmary in 1912 for one year. I assisted at many operations there for Dr. Turner and also the late Dr. G. S. Fraser and Dr. W. T. Gardiner, both eminent otologists. After the last war I both assisted and gave anaesthetics for the two latter for some years. So I can claim to have had the necessary experience of the operation on which to found my opinion. I personally have never allowed a patient of this practice to have the mastoid operation performed since 1919 to the present date. All ear cases have been treated at home by the parents and have all recovered. We are a practice of four partners—quite a large practice—and see very many so-called mastoids, and this is the treatment and results.

**Leucoplakia of the Tongue**

**Dr. PHILIP ROSS** (London, S.E.16) writes: I am interested in the query about leucoplakia in the *Journal* of Jan. 19 (p. 227). I have seen a few such cases caused apparently by the wearing of vulcanic dentures. In one severe case, in which all serological and other tests were negative, there was a widespread lesion on the tongue and the buccal surfaces of the cheeks, and a speedy recovery was made when the dentures were discarded. The patient was subsequently fitted with a pair made of plastic compound—hcalitic. The aetiological factors are rather obscure, but it is believed that irritation of the mouth is caused by minute electrical charges engendered by the vulcanic and "dissimilar" metals present in the pins of the plates.

**Benzyl Benzoate for Pediculosis**

**Dr. GEOFFREY DUCKWORTH** (London, W.1) writes: Regarding Dr. Blackstock's interesting account of his treatment of pediculosis capitis with benzyl benzoate (Jan. 22, p. 114), I can testify to the efficacy of a suitable emulsion of this substance for the purpose, as it has been used by several of my colleagues and myself at St. John's Hospital for Diseases of the Skin for the past two or three years. Incidentally, it is equally useful in pediculosis pubis.

**Examining School-children**

**Dr. EVA MCCALL** (Sunninghill, Berks) writes: May I join Dr. V. V. Brown (Feb. 12, p. 244) in protesting against allowing teachers to carry out any part of the medical examination of school-children? The recording of height, weight, and visual acuity should be done by school nurses before the medical inspection. The vision should, of course, be checked by the medical officer when carrying out routine inspection, and the visual defects, if any, dealt with appropriately. The school doctor, not the teacher, is surely the proper person to assess the importance of blinking, periodic squint, etc. I feel strongly that the teacher should take no part whatever in medical inspection, and that this should be carried out away from school buildings.

**An Old Midwives' Tale**

**Dr. T. P. C. KIRKPATRICK** (Dublin) writes: In the *Journal* for Feb. 19 (p. 277) you say that the "widespread popular belief that an eight-month foetus is less viable than a seven-month" is "a popular fallacy of uncertain origin." It may be of interest to note that the statement is made by Raynalde in the *Byrthe of Mankynde* (Bk. 11, c.-1), which was published in 1540, and which was taken from the *Rosengarten* of Eucarius Rosslin, which was published some twenty-five years earlier.

**Atmospheric Pollution with Cement Dust**

**Dr. D. N. STANDLEY** (Greenhithe) writes: Commenting on the letter I wrote some time ago in which I complained of the very great nuisance associated with the ceaseless outpouring of cement dust from the chimneys in this and other districts where cement is manufactured, Mr. P. G. Bowie of the Cement Manufacturers' Association stated that no dust streams out of these chimneys, but only water vapour. Obviously, we have all to learn that water vapour on condensation forms dust. I shall not waste time, yours or mine, on this matter beyond saying that everybody else is as surprised as I am to hear of such a physical phenomenon, and realize that we all have learnt something we had never heard of before. A neighbour of mine, who has seen the correspondence in the *Journal*, makes the following observation about the alleged dustless processes of cement manufacture: "In a comparative calm it is impossible to look upwards without experiencing pricking particles falling in the eyes. It is difficult to cycle or motor locally without this same experience. Gutters block up on an average every six months with grey mud. Following one day of fog at least two ounces of grey dust may be collected from any surface of about one yard square. Smoke stacks form a large mushroom top every few months. A saloon car dusts over almost as quickly as you clean it. After a spell of dry weather everything is grey with dust. Glass houses have to be cleaned with acid every year." This bears out the reality of my complaint and the need there is that it should be removed, if not while the war is on, certainly when it is over and things get back to normal again. My sole desire is not to make things unpleasant for anybody, but to voice a grievance which everybody else shares with me. This sort of thing has been going on for years. Some time or other it must end.



# BRITISH MEDICAL JOURNAL

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## SOMATIC MANIFESTATIONS OF PSYCHONEUROSIS

BY

IAN DOUGLAS-WILSON, M.D., M.R.C.P.Ed.

Capt., R.A.M.C.

A striking feature of psychoneurosis observed in the Services during this war has been the frequency with which somatic symptoms are presented. As the underlying mental disorder is usually revealed only by direct inquiry, such cases are commonly referred for investigation to the general physician. The object of this paper is to indicate how a positive psychiatric diagnosis has been reached in cases of this type without recourse to the negative exclusive method of diagnosis, which, as Cook and Sargant (1942) have pointed out, is both costly in time and money and harmful to the patient.

Of 810 patients sent for a medical specialist's opinion to a military hospital in England, 231 were diagnosed as psychoneurotic. Of this number 202 reported with symptoms referred to a particular part or to several parts of the body. Cases with organic disease have been excluded from the series except where the mental factor predominated. Psychoneurosis is taken to include anxiety state, hysteria, neurasthenia, and obsessive neurosis. The cases must be regarded as selected, because most patients with psychiatric conditions, recognized as such, were referred direct to the psychiatrist.

### Personal and Family Histories

The standards employed by Symonds and Russell (1943) in their investigation of head injuries were adopted for eliciting psychiatric histories. A history of mental disorder in close relations, of personal predisposition, or of actual previous psychiatric illness was recorded in 92% of all cases. The conditions were initiated, with one exception, without exposure to the strain of actual warfare. It is therefore not surprising that the percentage of predisposed subjects is higher than in Love's (1942) casualties at Tobruk and Symonds's (1943) cases of flying stress. The absence of personal or family predisposition was taken as an indication for redoubled caution in applying a psychiatric diagnosis. The constitutionally stable tend to develop psychoneurosis only after severe stress, the nature of which was usually elicited for the purposes of diagnosis. Some of the factors determining onset have been discussed elsewhere (Douglas-Wilson, 1943).

### Presenting Symptoms

Symptoms were presented in the following order of frequency (231 cases):

<b>Focal symptoms</b>	202 (87.4%)
Dyspnoea, palpitation, precordial pain, etc.	53
Headache	52
Respiratory symptoms	36
Abdominal symptoms	25
"Rheumatism": other motor and sensory disturbances	23
Urinary symptoms	13
<b>General symptoms</b>	29 (12.6%)
Nervousness	7
Lassitude	6
Amnesia	4
Dizziness	4
Rare symptoms	8

These figures are for the symptoms mentioned first or given greatest prominence by the patient. They do not reflect the total incidence of each group of symptoms. Combinations of two or more groups were common. For example, dizziness, though it was the primary complaint in only four cases, was a frequent subsidiary symptom, especially where the patient complained chiefly of dyspnoea, headache, or cough.

### 1. Cardiac Symptoms

The impression that the so-called "effort syndrome" is a manifestation of anxiety state has been strengthened in the last four years, though some cardiologists are not satisfied that it is entirely a psychosomatic manifestation. Wood (1941), in a careful analysis, found a family history of nervousness, insanity, or epilepsy in 56% of his cases, and noted that they showed "constitutional timidity and character inferiority."

**Personal and Family Histories.**—Of the 53 cases in this group 50 gave a positive family history of mental disorder or of personal predisposition. Sixteen were intellectually below average, and two illiterate. Thirty-one of the patients had been in civilian employment demanding little physical exertion. The three with no personal or family predisposition had all been submitted to extrinsic influences that had directed attention to the heart. One, after a long period in hospital with rheumatic fever, had received medical advice that strenuous exertion should always be avoided. The second was a man of 40 who, after prolonged sedentary employment, went on a battle course, where he was alarmed at his inability to keep up with younger men. The third was a man of 35, with a poor personality, who had done no work on account of weakness and palpitation since he had had rheumatic fever ten years previously.

**Aetiology.**—Physical and emotional stress, infection, and trauma are recognized as important aetiological factors. The induction of symptoms by suggestion through prolonged confinement to bed or by doctors' or relatives' warnings was found in 14 cases. It was noted that, whatever the reason for the patient's having been confined to bed—it varied from head injury to "nervous breakdown"—the patient himself had supposed that it was because of "something wrong with the heart." Not one of the patients that had been instructed to "take things easy" had sought further advice after the initial warning, which had been scrupulously observed in every case but one. In one case the condition appeared to be a specific response to conditions of war.

A corporal aged 49 had had palpitation, dyspnoea, and precordial pain while serving with the German Army in the First Great War. The symptoms subsided at the end of the war. After experience of a concentration camp he developed an anxiety state, but he had no further symptoms referred to the heart until he entered the British Army during the present war. The symptoms of which he had complained in the first war then recurred, though his Service employment was limited to the light work of a storeman, and he was considerably freer from physical and mental stress than he had been in Germany.

Several factors contributed to the production of the condition in some cases.

A private aged 39, with 15 years' unbroken service, reported with dyspnoea of one year's duration. His symptoms had started when he was transferred from a sedentary job to an active training unit. He said that he could run only 50 yards, when "everything went black" and he got stabbing precordial pain and palpitation. The symptoms had been worse in the last six months since a brother had been discharged from the Army owing to heart disease. A sister, killed two years previously, had had heart disease, and another brother was excitable and nervous. The patient had had a sub-average school record and, after several jobs as a labourer, had entered the Regular Army. He had liked his previous employment, in which he had apparently given satisfaction, but had not adapted himself to his new work. He had difficulty in keeping up with younger men and in learning new training: "it worries me that I will not please." He had been a bed-wetter till the age of 15, had recently had frequent sustained heavy headaches, was sleepless, and was subject to nightmares. He was depressed if not occupied, constantly recalling the death of his mother, who had been killed in an air raid two years before. He was absent-minded, had difficulty in mental concentration, and was tremulous and sweating under strain. He was unmarried, of temperate habit, and had a blameless Service record. He was mentally slow, tense, anxious, and co-operative. Physique was only fair, and he looked older than his years. There was no other evidence of organic disease.

**The Clinical Syndrome.**—The average age of the 53 patients was 31.1 years. Symptoms prior to enlistment were claimed by 25, in all of whom the condition had been aggravated by Army service. In two cases symptoms had first developed between the time of medical examination and mobilization. Particular help in diagnosis was obtained by tracing the relationship of onset and exacerbation to mental stress. In every case it was admitted that the amount of exercise required to induce symptoms varied. Dizziness, palpitation, "black-outs," and sighing for breath were further distinguishing features. Precordial pain was claimed in 42 cases, but its character seldom suggested organic cardiac disease. It was most often described as shooting or stabbing (20); less frequently as aching (7); drawing, pulling (3); cramp-like (3); and rarely as throbbing, tight, tearing, or "a strained feeling." More bizarre descriptions were given in three cases. Little help was obtained from examination of the cardiovascular system in the mild cases that constitute the majority in this series. Phobias or obsessions were admitted in 9 cases. These consisted of a sense of being gripped by the throat, associated with inability to wear anything round the neck; a feeling of suffocation in bed; an urge to breathe deeply "because no air is coming in"; and awaking with a sense of impending dissolution.

The psychiatric background in these cases has been the subject of detailed analyses (Wittkower, Rodger, and Wilson, 1941). The personality types most often encountered in this series were: (1) the immature, dependent type, usually querulously hypochondriacal; (2) the aggressive, resentful subject, who speaks defiantly of "my leaking valve" and resists reasoned reassurance; (3) the patient of inherently unstable temperament, with marked predisposition or actual previous history of psychiatric illness; (4) the artistic, "highly strung" man, with little liking for or adaptability to Service life; (5) the constitutionally stable type, who develops cardiac symptoms as an isolated manifestation after gross physical or emotional stress or after strong extrinsic direction of attention to the heart: in the Army, the most striking example of this group is the soldier of 35 to 40 who is called on to undertake strenuous training alongside younger men.

## 2. Headache

One hundred and thirty-one, or 57% of all cases, reported the presence of headache. This was described as heavy (34), pressing (32), aching (22), tight (12), throbbing (11), beating (5), shooting (5), tugging (3), and numb (2). Bizarre descriptions were given in five cases. The pain was said to last for many hours or days with little variation in intensity, or to come on in the mornings and to pass off about midday. It was sometimes aggravated by exercise, worry, excitement, heat, or a visit to the cinema. Partial relief was sometimes admitted by holding the head, mental diversion, and aspirin. In other cases no aggravating or relieving factors were recognized.

Twenty-seven of the 52 men with headache as the primary complaint dated their symptoms from previous head injury. It

is noteworthy that 11 of these were intellectually dull. These patients, even more than those complaining of headache without previous trauma, were preoccupied with the condition of their heads, and, in particular, with the possibility of further head injury. Two had made complete recoveries from severe head injuries and, after further trivial trauma, had developed gross psychoneurotic states with persistent headaches.

Of the 25 patients who had not been injured only two were intellectually below average. The development of headache as an isolated symptom of anxiety was recorded in four patients of conscientious type and excellent intelligence.

A padre in the middle thirties, who had been with a division that had seen much fighting, reported with unremitting pressing headache. He had been troubled by conflict between a sense of obligation to return to his division and fear that he might not continue under battle conditions to show the example that he felt was due from him.

Patients complaining of headache are sometimes preoccupied with fears of insanity or brain tumour. Dizziness and "black-outs" are common associated symptoms. The "black-out" is described as "a mist coming over the eyes" or as "a curtain drawn over the eyes."

## 3. Respiratory Symptoms

The complaint in each case of this group, whose average age was 29.9, was cough. No case has been included in which there was any abnormality on routine physical and radiological examination, and, in particular, cases of asthma have been excluded. There is no basis for regarding cough as either an expression of hysteria or a manifestation of vegetative neurosis. It is probable that some degree of tracheitis was present in each case. That tracheitis is prevalent in the Army is suggested by the questioning of 100 healthy controls, of whom 62 reported a persistent "smoker's cough."

The most frequent factor determining the patient's preoccupation with his chest was found to be family or personal experience of chest disease. Eighteen of the 36 cases gave a family history of tuberculosis in parents or siblings, and admitted to fear of this disease. Eleven others had had previous serious chest disorders, such as pneumonia. The cough was typically present throughout the year, with little seasonal or diurnal variation. A small amount of sputum was said to be expectorated. Some patients, especially those who had witnessed tuberculosis in their families, claimed loss of weight, night sweating, and even haemoptysis. Pains in the chest were reported in two-thirds of this series: it was described most often as tight, aching, or shooting; rarely as burning, searing, or heavy. Gross dyspnoea on exertion was reported in all except two cases. One of these had previously had pleurisy and feared tuberculosis. The other, as well as cough, had stabbing precordial pain and palpitation, and was alarmed at the possibility of heart disease, of which his mother had died. Twelve patients, in addition to dyspnoea, had other symptoms related to the heart. Of these, two, though their initial complaint was of cough, later admitted preoccupation with the possibility of heart disease.

## 4. Abdominal Symptoms

The true proportion of psychoneurotics presenting abdominal symptoms is not reflected in this series, as abdominal cases were mostly seen at a separate clinic, experience of which suggests that the syndromes presented fall commonly into one of these groups:

(a) The patient complains of vague diffuse pain, the site of which is indicated by sweeping the hand across the upper abdomen. It may be described as aching, burning, sharp, or heavy. It often dates from youth, is unremitting, and is progressive only from entry into the Service, this progression being attributed to "greasy food." It is constant throughout the day, but does not interrupt sleep. It is worse after meals, and alkalis provide, at best, only partial relief. Flatulence is prominent, and vomiting after all meals may be reported. The bowels are usually constipated. A family history of gastric disorders is forthcoming in half the cases. Examination shows no recent loss of weight. There is diffuse upper abdominal tenderness without special localization. Acrophagy may be witnessed, and, in hospital, vomitus is found to consist of a mouthful, or two of fluid regurgitated soon after meals. Temporary relief may be obtained by dieting, but, as Tidy (1943) has pointed out, relapse occurs as soon as the patient is discharged from hospital.

(b) The patient presents a group of symptoms that are compatible with peptic ulceration. The barium meal shows a hypertonic active stomach, and the fractional test meal may reveal hyperchlorhydria.

(c) The patient reports on account of constipation, lenteric diarrhoea, or griping lower abdominal pain. A spastic colon may be palpated.

(d) A bizarre picture is presented. An officer aged 32 gave a five-months history of constant unvarying nausea and "sense of apprehension" in the umbilical region. It was found that the symptoms had begun when he heard that his wife was pregnant.

### 5. "Rheumatism"; Other Motor and Sensory Disturbances

Twenty-two patients reported with muscle or joint pains. The localization of pains in five was accounted for by previous trauma or operation. Of the remainder, the factor determining localization could be detected in only one case—that of a patient, aged 41, who had had "a clawing feeling" and sense of coldness in both knees for nine years, since the doctor treating him for gonorrhoea had said that rheumatism might ensue as a complication. In the other cases pain was described as being in either muscles or joints, and was said to be constant and often symmetrical. It was most commonly aching, less frequently shooting, numb, pulling, cramp-like, or "a flushed feeling." Associated weakness was found in only one case, and no disturbance of cutaneous sensation was detected. Two patients who reported with lumbar pain admitted to preoccupation with the possibility of tuberculosis, of which there was a family history in each case.

One man, aged 31, with gross variable tremor of the right upper limb, reported that this had been present since a blow in the mid-thoracic region of the back at the age of 12.

### 6. Urinary Symptoms

The 13 patients reporting with urinary symptoms were juvenile immature types who particularly missed their home environments. Seven patients, five of them grossly dull and backward, reported nocturnal enuresis from infancy. All had noticed recent aggravation of the symptom. This was attributed by five to self-consciousness under Service conditions: one had noticed exacerbation since he had married, and the last dated the increase from the incidence of business worries. Six cases reported the recent onset of frequency, three of these having also recent nocturnal enuresis. Four of these patients were mentally dull. The onset in three had been associated with fears of venereal disease following exposure to infection. In the other three the symptoms had begun on enlistment, which had been associated with concern about separation from families. One of these patients, aged 39, gave a story of regular and classical migrainous attacks from enlistment two years previously. These simulated exactly the migraine to which his wife had always been subject.

### Discussion

Patients in this series, although their symptoms were predominantly somatic, readily admitted, on direct questioning, to concomitant mental manifestations. Where the onset was recent they quickly gained insight into the psychological origin of their condition. This coincides with the experience of Gillespie (1941) and others that the so-called "war neuroses" arise at a superficial level and seldom result in permanent personality changes.

Symptoms often coexisted in more than one system. For example, 81 of the 178 cases that did not primarily claim cardiac symptoms reported, as subsidiary complaints, dyspnoea, palpitation, or precordial pain. It appears undesirable that psychoneurotic states should be classified into such categories as "effort syndrome," because such grouping focuses unwarranted attention on a single aspect of the condition and, as Hyland and Richardson (1942) have pointed out, tends to obscure consideration of the underlying personality disorder.

Evidence of personal predisposition or a history of psychiatric illness in close relatives was found in most cases. Important factors determining the localization of somatic symptoms were existing trivial organic disorders; previous personal or family history of organic disease in the affected system; and recall of earlier warnings by doctors and relatives about the condition of the system involved. In some cases with cardiac symptoms prolonged confinement to bed had fixed attention on the heart; while in others the strenuous Service life had contributed to the localization. In most cases where a factor determining localiza-

tion was found, the patient admitted to fear of organic disease. The patient did not always refer symptoms to the system in which disease was feared.

In the remaining patients no factor determining localization could be found. These mostly had symptoms that were directly attributable to autonomic imbalance, such as "hypertonic gastritis" and frequency of micturition. It appears that revision of nomenclature is necessary to differentiate such "functional" conditions in which there is definite physiological disturbance, from those in which physiological disturbance is absent or unproved. This could best be effected by discontinuing the use of "functional" to describe either type.

The manifestations of anxiety state are now generally attributed to dysfunction of the sympathetico-adrenal reflex. More speculative psycho-analytical work suggests that the site of symptoms is conditioned by profound mental factors, the physiological response varying with different emotional tensions (Alexander, 1943). Whatever the ultimate cause, there can be little doubt that the immediate cause is organic, because, whatever the system affected, the symptoms tend to conform to fixed patterns. Divergence from these patterns suggests that the condition is attributable to hysteria or that the symptoms of vegetative neurosis have suggested to the patient hysterical features which have been superadded.

### Summary

The presenting symptoms in 202 cases of psychoneurosis reporting with somatic manifestations have been analysed. Predisposition to mental disorder was found in nearly all cases.

Important factors determining the localization of symptoms were found to be family or previous personal history of organic disease in the system involved and existing trivial organic disorders.

Cardiac symptoms had been suggested to some by long confinement to bed or by warnings to avoid exertion. In others, the energetic Service life had directed attention to the heart. In several, more than one extrinsic factor had produced the condition. Associated phobias were sometimes present.

Chest symptoms were commonly associated with fear of tuberculosis, of which there was a family history in half the cases. Gross dyspnoea was the rule.

Headache was seldom of a type that suggested organic disease. The patient was often preoccupied with the possibility of brain tumour or insanity, and—where the condition followed head injury—with the possibility of further trauma.

Abdominal symptoms, except when due to hysteria, tended to conform to one of three groups of symptoms. In some there was definite physiological disturbance.

Urinary symptoms were reported by patients of immature and dependent type.

Somatic manifestations, when due to anxiety states, usually conform to definite recognizable patterns. Symptoms often coexist in more than one system.

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### BIBLIOGRAPHY

- Alexander, F. (1943). *Psychosomatic Med.*, 8, 205.  
Cook, C. T., and Sargant, W. (1942). *Lancet*, 1, 31.  
Douglas-Wilson, I. (1943). *J. R.A.M.C.*, 81, 283.  
Gillespie, R. D. (1941). *Guy's Hosp. Gaz.*, 88, 38.  
Hyland, H. H., and Richardson, J. C. (1942). *Canad. med. Ass. J.*, 47, 432.  
Love, H. R. (1942). *Med. J. Austral.*, 2, 137.  
Symonds, C. P. (1943). *British Medical Journal*, 2, 703, 740.  
— and Ritchie Russell, W. (1943). *Lancet*, 1, 7.  
Tidy, H. (1943). *British Medical Journal*, 2, 463.  
Witkower, E., Rodger, T. F., and Wilson, A. T. M. (1941). *Lancet*, 1, 531.  
Wood, P. (1941). *British Medical Journal*, 1, 767, 805, 845.

Last July tens of thousands of contributors to the Hospital Saving Association decided to mark the 21st anniversary of their Association by a free-will offering of thanks to hospital nurses. They raised £12,000, which will be devoted to providing much-needed scholarships. These will be awarded annually over the next four years as follows: two scholarships for nurse students of £250 each, four for nurse teachers of £200 each, four for health visitors of £100 each, twelve for industrial nurses of £65 each, and four for midwife teachers of £75 each. The Rushcliffe report brought some improved conditions for nurses, but the proper training of new entrants will still depend upon competent teachers. H.S.A. scholarships will go a little way to securing these teachers and may stimulate others in the provision of postgraduate educational facilities.

# LUNG ABSCESS IN RELATION TO THE INFLUENZA EPIDEMIC

BY

ELI DAVIS, M.D., M.R.C.P., M.Sc.

Deputy Medical Superintendent and Physician, St. Andrew's Hospital (L.C.C.)

In the fourth week of Nov., 1943, the influenza wave impacted upon St. Andrew's Hospital. Some forty days later influenza admissions dropped abruptly. During this period 5 cases of lung abscess (3 fatal) were seen among 17 patients aged 12 to 60 with influenzal pneumonia. They are described below. Of the 12 other patients, 2 died, and one of the latter cases (on which a necropsy was done) is also described. Results of sputum cultures and white cell counts are given in the Table.

## Summary of 6 Cases of Influenzal Pneumonia, 5 with Lung Abscess

Case No. and Outcome	Bacteria in Sputum	Site of Abscess
I: Recovery	Staph. aureus (pure culture)	Right upper lobe
II: Death	Staph. aureus; H. influenzae; haem. strep.	Left "lower" lobe; left eye
III: Recovery	Staph. aureus; H. influenzae; pneumococcus	Right upper lobe
IV: Death	Staph. aureus; pneumococcus	Right middle lobe; right brain
V: Death	Haem. strep.; H. influenzae	None
VI: Death		

At the height of the disease the white cell counts ranged from 11,000 to 18,300 per c.mm., with polymorphonuclears around 80%.

### Case I

A housewife aged 38 was admitted with pneumonia of the right upper lobe, following influenza two weeks earlier. There was no response to full doses of sulphathiazole, and within 48 hours of admission radiological evidence of abscess of the right upper lobe was seen. She coughed up 2 oz. of slightly blood-stained purulent sputum daily, mostly after postural drainage. After four weeks of acute illness in hospital, with a temperature swinging between 99° and 102° and a pulse rate of 100 to 128 a minute, she began to recover steadily. Her serum contained no antibody for psittacosis antigen (Prof. S. P. Bedson) and no cold agglutinins.

### Case II

The illness of this patient, a labourer aged 40, began with dizziness and collapse five days before admission. There followed pain in the chest, cough, and scanty sputum but no haemoptysis. When seen he was panting and cyanosed; temperature 101.4°, pulse rate 92, respirations 32 a minute. He was regarded as a case of influenzal bronchopneumonia, with the right lung more involved than the left. There was heavy albuminuria. He died in 48 hours, having had 18 g. of sulphapyridine, oxygen, and nikethamide. At necropsy the right lung showed confluent bronchopneumonia, with numerous abscesses 0.5 cm. in diameter in the anterior half of the upper lobe, collapse at the base of the lower lobe, and purulent bronchitis. There was right serofibrinous pleurisy, with 15 oz. of pleural fluid. The left lung showed oedema and congestion only.

### Case III

In this case, that of a lorry driver aged 33, influenza began one week before admission and was followed by rigors, cough, and scanty rusty sputum. On admission he had left basal crepitations. Temperature 100.8°, pulse 112, respirations 28. Severe left uveitis developed in two days, and blisters on his fingers 24 hours later. The left eye became more and more inflamed until there was a panophthalmitis. Sulphapyridine was given in full doses from admission and sulphacetamide was applied to the eye, but without benefit. The left eye was removed on the 12th day of the disease by Mr. M. Shaw. A radiograph on the 15th day showed an abscess of the left lower lobe. Temperature and pulse settled on the 24th day, and there was steady improvement thereafter, with natural healing of the abscess.

### Case IV

A labourer aged 57 had suffered from chronic bronchitis for years. He collapsed one week before admission, and cough with yellow sputum developed. When admitted he showed marked cyanosis and dyspnoea, general bronchitis and right bronchopneumonia; temperature 99.4°, pulse 132, respirations 32. He seemed to respond

to sulphapyridine, the fever subsiding quickly and the temperature remaining down while on sulphapyridine (25 g. given) and for a further 60 hours. The temperature then rose again and ranged from 98° to 103°. On the 23rd day of the disease the sputum became bloody and treacly, and abscess of the right upper lobe was diagnosed and confirmed by x rays. He coughed up 14 oz. of sputum daily, mostly in the morning, after postural drainage. His temperature settled (spontaneously) on the 43rd day of the disease, but his general condition deteriorated, and he died afebrile on the 46th day. Necropsy was refused.

### Case V

A female munition worker aged 20 was taken ill 5 days before admission with a rigor, tightness behind the lower sternum, and slight cough with scanty sputum. On examination she presented a toxic aspect, and had a few crepitations over the right anterior axilla; temperature 103°, pulse 120, respirations 24. The temperature dropped abruptly after 6 g. of sulphapyridine, but rose again, gradually at first, despite continuing with the drug. By the time 25 g. was given the temperature had reached 104°. Sulphapyridine was stopped. Fever continued swinging from 100° to 104° for the next ten days. Rales became numerous at the right base. The patient insisted that she "felt fine." A drachm or so of nummular sputum was coughed up daily, and was haemorrhagic only once. On the 21st day of the disease tinkling rales were heard over the right mid-zone, and lung abscess was considered. Rales were also heard over the left base. Sulphamezathine therapy was begun; but by the 23rd day deterioration was pronounced, with drowsiness, contracted pupils, and bilateral papilloedema. The cerebrospinal fluid was turbid with masses of polymorphonuclears, but no organisms were grown from it. Sodium sulphadiazine (5 g.) was given intravenously, and was repeated next morning, in addition to oral sulphamezathine. She died on the 25th day of the disease.

**Chest Radiographs.**—On the 9th day of the disease x-ray films of the lungs showed no abnormality; on the 15th day there was a right hilar shadow (later proved to be due to lung abscess), with surrounding pneumonia. Blood culture was negative.

**Necropsy.**—There was muco-purulent bronchitis. The right middle lobe showed grey consolidation. Anterior to this grey area was a superficial acute abscess 5 by 4 by 4 cm., extending nearly to the midline behind the sternum. There was a spread of pus to the mediastinum above the base of the heart, with two small secondary abscesses here, near enlarged lymphatic glands. Intense congestion, collapse, and recent bronchopneumonia were observed in the right and left lower lobes, and recent fibrinous pericarditis. The spleen was moderately enlarged, congested, and soft. In the brain were two superficial acute abscesses, 2.5 cm. in diameter, containing green pus—one in the right temporo-parietal region, and one in the right occipital region, with purulent basal meningitis. The middle-ears were clean. The pus from the brain abscess grew a pure culture of haemolytic streptococci, although the organisms from sputum culture were *Staph. aureus* and pneumococci.

### Case VI

A housewife aged 56 gave a history of two attacks of influenza in the previous month. The second attack began two weeks before admission and was followed by cough and chest pain. On examination there were signs of left basal consolidation and right bronchopneumonia. The temperature (99.6°) soon subsided with sulphapyridine therapy, and by the time 22 g. had been given had been normal 48 hours. The drug was stopped, but the temperature rose again, and continued to swing between 99° and 101°. She coughed up 1 oz. of blood-stained sputum daily. The lung signs persisted, and she deteriorated, dying on the 19th day in hospital. She had been given sulphamezathine for the last 36 hours of life.

**Necropsy.**—There was a diffuse, coarsely granular consolidation of all lobes of both lungs and dense diffuse fibrosis of the bases. The appearances suggested unresolved pneumonia on a previously fibrotic lung, and this was confirmed histologically. There were recent bilateral fibrous pleural adhesions. The spleen was twice the normal size, oedematous, congested, and soft.

### Discussion

Influenzal pneumonia was diagnosed on clinical grounds. The disease began in most of the patients with the features characteristic of the influenza prevalent in the neighbourhood—fever, malaise, generalized aches and pains, and cough with scanty sputum. When pneumonia developed the temperature was not initially as high as in lobar pneumonia, but fever was more prolonged. Physical signs were not clear-cut. White cell counts were essentially the same as in primary lobar pneumonia. The sulphonamides had no obvious effect in at least 12 of the 17 cases. The remaining 5 cases cleared up well concurrently with the administration of sulphonamides.

It is conceivable that complications and mortality would have been greater but for the sulphonamides, but I do not think so.

The 17 patients considered in this paper were aged 12 to 60. Pneumonia in infants did not differ essentially from the cases I saw in the previous year. Many chronic bronchitis over the age of 60 who would almost certainly have died during the winter from bronchopneumonia and congestive heart failure had death precipitated by influenza. Of the 17 cases, 12 recovered. Recurrent epistaxes were prominent in one boy, another patient had haemorrhagic vesicles of the inner cheeks, and one had a small pleural effusion. Pneumonia was bilateral in 4 patients. Before the epidemic proper began, 2 cases of influenzal pneumonia were seen—a fatal case in August on which a necropsy was done, and one in mid-October which recovered.

It is of interest to compare this experience of influenzal pneumonia with 5 deaths and 5 cases of lung abscess (and *Staph. aureus* the chief organism concerned) with recent experience of lobar pneumonia. From Oct. 1, 1942, to Dec. 31, 1943, I saw 107 consecutive cases of primary lobar pneumonia, the ages ranging from 5 to 65. There were 2 deaths, and 2 cases of lung abscess with recovery. From Jan. to Oct., 1943, I saw 13 cases of primary atypical pneumonia (one with rising titre of psittacosis antibody—Prof. Bedson), but none since. It is tempting to inquire if there is any relation between the recent frequency of primary atypical pneumonia and the influenza epidemic.

Concurrently with the influenza epidemic, primary lobar pneumonia became much more frequent here: 26 patients aged 5 to 65 were seen in 40 days, with one death. It may be that a number of these cases were really influenzal pneumonias, but there was not enough clinical evidence for so regarding them.

#### Summary

In the recent influenza epidemic, among 17 cases of influenzal pneumonia—ages 12 to 60—there were 5 deaths. There were 5 cases of lung abscess (3 fatal), and one patient who recovered had a metastatic panophthalmitis. *Staph. aureus* was an important invader. Sulphonamides were not beneficial. In 107 cases of primary lobar pneumonia—aged 5 to 65—there were 2 deaths, and 2 cases of lung abscess with recovery.

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## PROGNOSTIC VALUE OF LABORATORY INVESTIGATIONS IN TYPHOID FEVER

BY

S. S. BHATNAGAR, M.D., Ph.D., F.R.C.P.

Lieut.-Colonel, Indian Army Medical Corps

(From a Combined Indian General Hospital, India Command)

Laboratory investigations in typhoid fever are usually employed for the confirmation of clinical diagnosis, either directly by the isolation of the infecting organism from blood, urine, or faeces, or indirectly by the estimation of antibody production, chiefly Vi and O agglutinins, as proof presumptive of the presence of *Bact. typhosum* in the human body. In military hospitals in India blood cultures in the early stages, agglutinations throughout the course of infection, and collection of evidence for the excretion of micro-organisms, even during convalescence, comprise the routine procedure for such cases. The analysis of collective results so obtained, in conjunction with clinical observations, indicated that the various combinations of signs and symptoms met with in this disease were associated with distinct variations in laboratory findings, the study of which was of considerable prognostic significance. Not only was it thus possible to gain an insight into the ups and downs of the struggle between host and parasite, but specific antityphoid serum therapy, practised in a large number of cases (to be presented in a subsequent communication), could also be placed on a more satisfactory basis.

The object of this paper is to describe and discuss the prognostic inferences drawn from a study of 280 cases of typhoid fever in which laboratory investigations were carried out at short intervals throughout the course of infection. Reference is made to certain aspects of the diagnosis and prophylaxis of typhoid that are directly related to the observations recorded here. For reasons of space tables and charts are not included.

The whole group of cases has been subdivided into six different clinical and bacteriological identities. Although some overlapping of symptoms, rather than of signs, was noticeable between the various subgroups, it was not extensive enough to confuse the main issues.

### Clinical and Bacteriological Types of Typhoid Cases

1. *Simple Type*.—These cases presented the textbook description of the disease, with temperature which followed the course of three well-known stadia—*incrementi*, *acmes*, and *decrementi*. The total duration of pyrexia varied from 10 to 25 days, depending upon the inoculated state of the individual. In a person who had had multiple injections of T.A.B. vaccine—prepared in a reliable institution with appropriate strains of *Bact. typhosum*—all the stages were completed quickly, and the patient looked so well towards the end of the second week that, in the absence of laboratory diagnosis, doubts could be expressed as to the nature of the infection. Such cases were usually met with among military personnel with more than six years of colour service. In the uninoculated pyrexia was prolonged until the fourth week. In both types of individuals, however, the entire course of the disease was free from complications. Bacteriologically, blood culture was usually negative, since bacteraemia in such cases was of short duration. Agglutination tests, on the other hand, were most satisfactory, and of the type commonly designated as "Widal-positive"; the O titre was about 200 and the Vi agglutinins were as described in a previous communication (Bhatnagar, 1938). It was easy to isolate the infecting organism from urine or faeces, or both, during the second, third, or fourth week. The strain isolated was agglutinable by both O and Vi sera, and its average lethal dose (a.l.d.), for white mice weighing from 20 to 22 g., was more than 100 millions—the V-W type of organism described by Kauffmann (1935).

2. *Ambulatory Type*.—These cases represented the other extreme of the prognostic picture in that they were invariably fatal. Before the patient was obliged to seek admission to a hospital or take to bed properly, he had been definitely ill for over a week. The case below illustrates the various points:

A robust, healthy man, 28 years of age and 14 stone in weight, was feeling seedy for about 10 days before admission to hospital. During this period he took aspirin and quinine regularly to enable him to carry out his duties. He was ultimately obliged to stay in bed. On admission enteric was suspected, and in spite of careful nursing and efficient palliative treatment his condition deteriorated. On the fifth day he complained of pain in the lower abdomen. Clinical examination revealed perforative peritonitis. His general condition was, however, so bad that any surgical intervention was ruled out; he died a few hours later with a rectal temperature of 110° F. Necropsy revealed typical typhoid ulcers in the small intestine.

Laboratory investigations in such cases were most disappointing: they presented a completely negative picture—so much so that the reliability of clinical diagnosis was questioned on more than one occasion. No Vi agglutinins were detected at any stage of the disease, although in some cases the O antibody titre could be considered to be suggestive of typhoid infection. Diagnosis could be confirmed post mortem only by direct culture from inflamed Peyer's patches, spleen, gall-bladder, and bone marrow. In the few cases in which this facility was available it was particularly observed that the growth of *Bact. typhosum* on first isolation was scanty and the strain of only average virulence—a.l.d. more than 100 millions, and the organism agglutinable by both O and Vi sera.

3. *Toxic Type*.—These cases were usually seen either among the civilian population or among military personnel—such as drafts arriving from over-seas—who had not had the benefit of multiple T.A.B. inoculations. The patient was clinically toxic before the end of the first week of illness; the skin



was dry and the tongue dry and deeply furred. There was general clouding of intellect; and the mental processes varied from simple slow cerebration to general apathy or, conversely, marked delirium. Usually there was no localized involvement of any particular organ, but haemorrhage from the bowels occurred in a number of cases. The most characteristic bacteriological feature was an abnormal rise in the titre of O agglutinins with no evidence of Vi antibody formation. In this series the O titre varied from 2,000 to as much as 20,000. Blood culture was usually positive during the first week, but no excretion of organisms could be detected in later stages. In cases which ended fatally this held true and the high titre of O agglutinins was maintained. On the other hand, in those who recovered, either naturally but more often through serological intervention, some remarkable changes took place in the bacteriological picture within as short a period as 24 hours. There was a sudden drop in O titre to normal proportions (200–500), with simultaneous appearance of Vi antibody accompanied by what may be termed a flooding of both urine and faeces with typhoid bacilli. The strains isolated were fully virulent, inagglutinable by an O serum, but easily clumped by a Vi serum with an a.i.d. of less than 100 millions—the V type of organism described by Kauffmann (1935).

**4. Prolonged Pyrexia (P.P.) Type.**—The duration of pyrexia in such cases varied from 6 to 12 weeks. During this prolonged course the temperature showed a tendency to drop to normal on more than one occasion; but these oscillations could be easily distinguished from true relapses in that the temperature did not stay at normal longer than from 24 to 48 hours. Such cases were usually free from complications, the only complaint being "fever" for which causes other than typhoid infection—especially *B. coli*, pyelitis, and pulmonary tuberculosis—were looked for with negative results. The diagnosis was easily established by a positive blood, urine, or faeces culture. The characteristic feature was either a complete absence or a very low titre of Vi antibody. So long as Vi titre did not improve, the fever continued. It was only when this antibody developed, either naturally or by artificial introduction into the system through serum therapy, that the host got the better of the parasite and infection terminated. The micro-organism isolated was easily agglutinable by both O and Vi sera with an a.i.d. of more than 100 millions.

**5. Embolic Type.**—The predominant feature of these cases was the abnormal localization of the infecting organism in one of the organs—chiefly lungs, meninges, or intestine—resulting in bronchopneumonia, specific meningitis, or a severe form of melaena respectively. The clinical picture is commonly referred to as complicated typhoid fever. The course of infection was unduly severe and the mortality heavy. There was no evidence that the condition was metastatic in origin, the term "embolic" being applied only for descriptive purposes. The infecting organism was isolated from the peripheral blood with ease not only in the early stage but also during the second and third weeks if the patient lived. There was considerable excretion of bacteria via both the kidneys and the intestine; and in certain cases the unusual picture of blood, urine, and faeces all being positive at the same time was encountered. Serological tests, on the other hand, were disappointing, there being complete absence of Vi antibody with little rise in O agglutinins. The strain of *Bact. typhosum* isolated was highly virulent, with an a.i.d. in the region of 60 to 80 millions, inagglutinable by an O serum but reacting to Vi antibody.

**6. Relapse Type.**—During the course of typhoid infection relapses occur in a certain percentage of cases. Clinically there are no means by which we can assess the possibility of such an event taking place. Laboratory investigations, however, suggested that certain unusual occurrences should arouse suspicion about the possibility of a relapse—namely: (a) a positive blood culture during the third week where previous cultures had proved sterile; (b) a positive blood culture with the temperature on the down grade; (c) a fall in the titre of Vi agglutinins in the third week without a similar simultaneous effect on temperature; and (d), conversely, the maintenance of a high Vi titre with temperature showing a normal tendency.

## Discussion

To appreciate the prognostic significance of the variations in laboratory findings in different types of clinical manifestations of typhoid fever it is necessary to take into account the part played by Vi antibody in typhoid immunity as described by Felix and his co-workers—for references see Topley and Wilson (1936). In our experience the presence of this antibody in a sufficiently high titre (50–250) always connoted a satisfactory outlook. If this antibody was present early in the disease and the high titre was maintained over a number of days it could be predicted with confidence that the course of infection was going to be short and the patient on the road to convalescence by the third week. Such cases are included in the *simple type* of infection described. They formed a large component of a previous communication on the value of Vi agglutination in typhoid fever, to which reference has already been made.

We have no record of a case in this series in which a high Vi agglutinin titre was associated with such fulminating symptoms as are included under the *embolic type* of infection, although 73 cases of this nature were studied. The Vi antibody was either completely absent or, if detected, the reading was seldom higher than 10–20; even this low titre was not maintained, and it appeared only spasmodically. If the case was to end fatally there was no rise in Vi agglutinins. On the other hand, in the few cases that recovered naturally—only 4 out of 73 in this group—the improvement in the clinical condition was preceded by an elevation of Vi titre. In two of these, with lung involvement, Vi antibody developed suddenly and a high titre (80–160) was kept up for 11 days. The lung condition cleared and the patient recovered after prolonged convalescence. In the other two, with bowel haemorrhages, the Vi titre dropped from 160 to 20 within 3 days, with a concurrent fall of temperature to subnormal. Both these cases relapsed—on the fifth and the sixth day respectively, with one and two similar relapses subsequently—before a sustained Vi antibody titre was elaborated naturally and the infection was eventually overcome on the 79th and the 88th day of disease.

Study of the *prolonged pyrexia (P.P.) type* of infection lent further support to the role of Vi antibody in the pathogenesis of typhoid fever. Nineteen such cases were observed. Clinically, everything was in the patient's favour, especially his general condition and the freedom from complications. The fever, however, continued for weeks. It came to an end only when a sustained Vi titre was recorded, either produced naturally or provided by specific serum therapy.

An abnormal rise in O agglutinins was seen to be associated with the *toxic type* of case, the titre of this antibody in different cases varying from 2,000 to as much as 20,000. In none of the other types of typhoid fever cases was this high reading encountered, nor was it experienced in their treatment with either Felix or convalescent serum. In view of the high mortality in this group—15 out of 27 cases studied having proved fatal—and the fact that recovery was always preceded by a considerable drop in the O titre of serum, the high rise in O agglutinins must be considered to be pathological, since its prognostic interpretation is directly opposed both to the generally accepted clinical concept associating O antibody production with favourable prognosis and the immunological observation that the O titre of a serum expressed its protective value in relation to endotoxins. As all the cases were highly toxic the possibility of abnormal O-antibody production becoming associated in some unknown manner with toxin liberation; rather than being responsible for its neutralization, cannot be ruled out, although there is no experimental evidence to support this view. It will also be seen from the observations recorded that O antibody is not concerned in the excretion of typhoid bacilli from the human body, since none was found to take place while the high titre lasted.

Of the *ambulatory type* 32 cases were under review. All of them were characterized by: (1) absence of complete rest during the first week after the signs and symptoms associated with the early stage of typhoid fever had appeared; and (2) the employment of antipyretic drugs. Both these factors produced catastrophic results, our records showing 100%

mortality. It can therefore be assumed that complete rest and free play for the rise in temperature are of paramount importance in the second stage of typhoid infection—the first being the incubation period—and that interference by such drugs as aspirin, quinine, and those of the sulphapyridine group, etc., for any length of time, is likely to affect the prognosis adversely if *Bact. typhosum* happens to be the responsible organism.

True relapses were recorded in 18 cases—over 6% of the total series. In 10 of these there was one relapse, in 7 others it was repeated, and one case relapsed three times. While a high percentage of positive blood cultures was obtained during the relapse period (in 14 out of 18 cases), on six occasions cultures were positive before the relapse had taken place. In four of these the temperature was on the down grade and two previous blood cultures had proved sterile; in the remaining two, cultures were sterile after the temperature had stayed subnormal for 4 and 5 days respectively. In all but two cases Vi agglutinins had practically disappeared during the subnormal stage of temperature. In these two exceptions, however, the curious combination of subnormal temperature, positive blood culture, and a Vi titre of 40–80 was encountered. The case with three relapses started well in that Vi agglutinins appeared early—on the ninth day—and continued until the 22nd day. Then there was a sudden drop, with temperature still at 100.2° F. Although the subnormal stage was reached on the 25th day, it remained so for only 5 days, the temperature then rising, with two similar subsequent events. These observations would justify the assertion already made as to the possibility of a relapse in the presence of unusual laboratory findings. The practice of a blood culture and an agglutination test when the temperature shows a downward tendency should therefore be considered worth a trial during the later stages of typhoid infection.

### Some Practical Points

Reference may now be made briefly to the application of observations discussed here from the prognostic and prophylactic points of view. In a case suspected clinically to be suffering from typhoid fever there is a tendency to assess the result of an agglutination test in terms of a positive or a negative Widal reaction, depending upon the titre of antibodies so detected. And, what is more important, a so-called negative Widal is taken to mean the exclusion of typhoid infection. From the present observations, and the experience of typhoid serology over a number of years, it cannot be too strongly emphasized that, in a case of remittent pyrexia, absence of Vi antibody or a lack of an appropriate rise in the titre of O agglutinins does not in any way exclude the possibility of the infection being typhoid in origin. It would therefore be better if the term "negative Widal" were entirely eliminated from typhoid terminology, since the meaning commonly attached to it leads to a sense of false security and indulgence in medication of a type likely to worsen the ultimate prognosis in the manner already pointed out.

The utility of Vi agglutination as a diagnostic measure has given rise to considerable differences of opinion. The present communication should throw some light on this problem. It will now be clear that an early rise in Vi agglutinins should be expected only in cases with mild symptomatology. Where complications have set in, a reasonably high Vi titre will be encountered only if and when the clinical tide turns in favour of the patient, and this Vi reading will persist at least for the next few days. In spite of observations to the contrary we have failed to discover this antibody as a natural agglutinin. Its presence had always been found to be associated with the existence of *Bact. typhosum* in the human body. Results to the contrary were mainly due to non-specific reactions likely to arise when suspensions of Vi I strain (Bhatnagar *et al.*, 1938), now employed almost universally for the purpose of Vi agglutination, had been preserved too long and the organism, either before or after the preparation of agglutinating suspensions, allowed to undergo S—R variation.

From the prophylactic point of view attention has already been drawn to favourable prognosis in an individual who has

had the benefit of multiple antityphoid inoculations over a number of years. Credit in such cases is usually given to the quality or type of vaccine employed. From a series of experiments on antibody production after T.A.B. inoculation in human beings it was pointed out a few years ago (Bhatnagar *et al.*, 1937) that protection against infection was best afforded by repetition at suitable intervals of stimuli given to the antibody-forming apparatus rather than by the quality or type of a single stimulus. The correctness of this view has now been confirmed by a change towards severity in the type of an average case of typhoid fever in military hospitals, due to a large influx of comparatively unprotected civilian personnel for military service and the drafts of non-tropical residents from over-seas, the majority of whom have had only one course of T.A.B. vaccine. It is the considered opinion that the practice of this prophylactic measure at shorter intervals during the first two years of military service in the Tropics—(a) on being called up, (b) on disembarking in a tropical country, and (c) subsequently at the end of 6 and 15 months—would result in a great improvement in the prognostic outlook in the event of actual typhoid infection.

### Summary

A close association between prognostic outlook and the results of laboratory investigations has been found to exist from the analysis of 280 cases of typhoid fever.

The cases have been classified into 6 groups, each with varying clinical and bacteriological characteristics.

Observations showed that if Vi antibody was present early in typhoid fever in a sufficiently high titre (50–250), and this titre was maintained over a number of days, the course of the infection would most likely be short (*simple type*).

In the *embolic type*—in which the Vi antibody was either absent or seldom above 10 to 20—improvement was preceded by a rise in Vi titre.

The *prolonged pyrexia (P.P.) type* resolved only when a sustained Vi titre was recorded. It must be stressed that, in the case of remittent fever, absence of Vi antibody or the lack of an appropriate rise in O agglutinins does not exclude the possibility of the affection being typhoid.

An abnormal rise in O agglutinins was observed in the *toxic type*, the titre varying from 2,000 to 20,000. Since a considerable fall in the O titre of serum always preceded recovery, the high rise of O agglutinins must be regarded as pathological.

In the *ambulatory type* complete rest and non-interference with the rise in temperature appear to be of the greatest importance in the second stage of the disease.

Relapses occurred in 6% of the whole series. Unusual laboratory findings appeared to be associated with the possibility of relapse.

An early rise in Vi agglutinins should be expected only in mild cases.

### REFERENCES

- Bhatnagar, S. S. (1935). *British Medical Journal*, 2, 1195.  
 — Speechly, C. G. J., and Singh, M. (1938). *J. Hyg., Camb.*, 38, 663.  
 — Freeman, J. F., and Dhilon, C. S. (1937). *Indian J. med. Res.*, 24, 597.  
 Kauffmann, F. (1935). *Z. Hyg. Infektkr.*, 116, 617.  
 Topley, W. W. C., and Wilson, G. S. (1936). *Principles of Bacteriology and Immunity*, Edward Arnold & Co., London.

R. Torpin (*Amer. J. Obstet. Gynec.*, 1943, 46, 557), who records a personal case and has collected 27 others from the literature, states that spontaneous haematoma of the rectus abdominis muscle occurs in both white and negro women. Primary aetiological causes were trauma, cough, labour, strain, or, rarely, external injury. Other primary factors were, rarely, muscle degeneration from typhoid fever or influenza. Secondary aetiological influences were age, multiparity, and terminal stages of pregnancy. Conservative treatment consisted in early diagnosis, complete rest, and blood transfusion. The maternal mortality was 15% and the foetal much higher. Torpin's case was a negress aged 34, a 12-gravida; operation was performed without evacuation of the clot, and both mother and child lived.

## TREATMENT OF OCULAR INFECTIONS WITH PENICILLIN

BY

G. T. WILLOUGHBY CASHELL,  
M.B., B.S.Lond., F.R.C.S.Ed.

Squadron Leader, R.A.F.; Ophthalmic Specialist, R.A.F.

The use of penicillin in ophthalmology has led to the rapid and successful treatment of many acute bacterial infections, and the risk of intraocular infection following injuries has been lessened. The following report of a series of cases treated with this drug at an R.A.F. hospital is presented in substantiation of these remarks.

Before giving details of the cases it is necessary to outline briefly: (1) the principles of the treatment; (2) the types of ocular infection suitable for treatment; (3) the methods of application and dosage; (4) the assessment of the results.

### Principles of Treatment

Penicillin is admirably suited for surface application, and can be used in the form of drops in ophthalmic work. It is found that only small quantities need be employed: doses in the order of 1,000 units are sufficient to treat many cases. The drug has been used in the form of the calcium or sodium salt; both have been well tolerated in the eyes, and have been injected into the anterior chamber. It is known that penicillin is successful only when the primary infecting organism is sensitive to the drug in therapeutic concentration. It must also be capable of gaining access to the site of infection.

In the first place, organisms commonly found in ocular infections which are susceptible to the action of penicillin are *Staph. pyogenes*, the haemolytic streptococcus, the gonococcus, and the pneumococcus. Sensitivity to penicillin is not affected by a resistance to the action of sulphonamides. Sulphacetamide has been advocated for use in these infections. This drug has a negligible action against the staphylococcus, the commonest organism found in this series of ocular infections. Its action against the streptococcus is limited by pus, which contains antagonistic substances. On the other hand, penicillin in extremely low concentration completely inhibits the growth of both staphylococci and streptococci, and its action is in no way impaired by pus. Experiments during this survey also show that the organisms isolated from ocular infections—the bacillus of Petit and the Morax-Axenfeld bacillus—are insensitive to penicillin when tested *in vitro*.

In the second place, the eyelids, conjunctival sacs, corneae, and lacrimal sacs are ideal for the use of penicillin, as it can be applied with ease, and at the same time gains access to all parts of the ocular and palpebral conjunctivae, the lid margins, and the lacrimal sacs.

### Types of Ocular Infection Suitable for Treatment

(a) Acute conjunctivitis and blepharitis, which react well to penicillin; the infections that are usually found to be due to *Staph. aureus*, streptococcus, or pneumococcus, and are often associated with marginal keratitis and corneal ulceration. (b) Chronic blepharitis, usually due to *Staph. aureus*. (c) Infected corneal ulcers, either due to trauma or associated with the above conditions. (d) Perforating corneal injuries with prolapse of the iris and the risk of intraocular infection.

### Methods of Application and Dosage

Penicillin can be used in the eye in the form either of drops or of ointment. Irrigation of the anterior chamber can be carried out with a solution of the drug in certain cases in which infection of that structure has taken place through a perforating wound. A dosage of penicillin drops, strength 500 (Oxford) units per c.cm., is efficacious. Penicillin is also of value as an ointment made up in a soft lanette wax base of 500 units per gramme. In acute cases, and in perforating wounds where infection is apparent within 24 hours of the injury, applications of penicillin should be made at half-hourly intervals for the first 24 hours. Thereafter the applications

can be reduced to two-hourly and, later, four-hourly. From the cases quoted below it will be seen how rapidly ocular infections are rendered sterile. It is possible to save eyes which would otherwise undoubtedly have been lost from intraocular infection.

It must be remembered that penicillin loses its potency after keeping. It is necessary to store it carefully in a refrigerator, and it is advisable to have small quantities made up at a time. The solution should be freshly prepared every 14 days.

### Assessment of Results

Control of the cases was done by clinical assessment of recovery and by cultures taken from the infected area. It was found essential to keep a close watch on the infection, and directly a case was seen cultures were taken from the lid margins, conjunctival sacs, or corneal surfaces, depending on the site of the infection. Ideally these cultures should be taken every 48 hours. They generally become sterile within 7 days.

### Cases of Blepharitis

Case	Type of Discharge and Duration	Culture	Penicillin per Day (in Oxford Units)	Sterile in Days	Result
1	Watery; 12 mths.	Staph. pyo.	58	12	Lids clean
2	Crusting	" "	130	13	Healed
3	Watery; 2 yrs.	" "	40	10	Lids clean
4	Crusting; 2 mths.	" "	40	12	Satis.
	Relapse 2 mths. later	" "	40	14	Improved
5	Watery; 14 yrs.	Sterile	390	20	"
6	Dry, 7 mths.	Staph. albus	1,800	10	Clear
7	Dry	" "	1,560	10	"
8	Serous; 5 yrs.	" pyo.	1,560	13	Clear
9	Dry; 3 yrs.	" "	420	13	"
10	Scaly; 5 days	" "	420	8	Clear
	(4 days treated with mercurochrome and argyrol—still Staph. pyo.)				
11	? 1 yr.	Staph. pyo.	58	14	Clear
12	Scaly; 3-4 yrs.	Sterile	174	7	Clear
13	Watery since childhood	" "	390	12	"
14	Watery; 6 mths.	Staph. pyo.	420	14	"
15	" 5 mths.	" albus	390	6	"
16	" 2 yrs.	" pyo.	420	12	Sterile
17	Scaly; 1 yr.	" "	420	6	Clear
18	Scaly since infancy	" "	420	4	"
19	"	" "	420	12	Sterile
20	Scaly since childhood	" "	420	10	"

In the cases of blepharitis the history varied from 5 days to 15 years; all had a typical watery discharge, with crusting of the lashes and redness and soreness of the lid margins. The cultures showed *Staph. pyogenes* in 15 cases and *Staph. albus* in 3 cases; no definite organisms were isolated from the remainder. The average number of units of penicillin used in each case per day was 560, given either twice or three times a day as drops made up in 500 units per c.cm. The average period to elapse before obtaining a sterile culture was 12 days, and at the end of that time discharge had ceased and the lids were clean and comfortable.

A relapse of the blepharitis occurred in 2 cases—Nos. 4 and 19. In Case 5 after 20 days' treatment the condition had only improved slightly; and here the history was that the infection had been present for 14 years. It is difficult to be dogmatic about the permanency of the results of treatment in these chronic cases without a very careful follow-up, but there is no doubt that in most of the cases the lid condition improved very markedly under treatment.

### Cases of Acute Conjunctivitis

Case	Type of Discharge and Duration	Culture	Penicillin per Day (in Oxford Units)	Sterile in Days	Result
1	Watery; 3 mths.	Staph. pyo.	390	11	Clear
2	"	" "	195	7	Eye white
3	Purulent; 11 days	Diphtheroids	40	11	"
4	Watery; 7 days	Staph. pyo.	130	12	"
5	" since 1918	Diphtheroid; streptothrix	390	21	Improved
6	" 5 days	Staph. pyo.	390	21	Clear
7	" 3 mths.	" "	130	7	Eye white
8	" 6 yrs.	" "	130	14	Sterile
9	" 7 days	" "	390	6	"
10	Purulent; 3 days	" "	390	4	"

The history of the cases of acute conjunctivitis varied from 7 days to frequent acute relapses over a period of years.

*Staph. pyogenes* was present in 8 cases. The average number of units each case received per day was 190, and sterile cultures were obtained in 10 days; the eyes were white.

In this series there was no doubt about the dramatic improvement in the condition of the eyes under treatment. One case in particular—No. 9—may be cited. This man came in with a very severe infection of both eyes, superficial keratitis, extreme photophobia, and blepharospasm, and the weeping eyes caused a spreading infection of the skin of the lids, which eventually affected the whole of the face and down the neck. After 48 hours' treatment with penicillin the eyes could be opened without discomfort, the conjunctiva had become almost white, and the skin of the lids was clearing rapidly. Within a week the whole condition had subsided.

#### Cases of Corneal Ulcer

Case	Type of Discharge and Duration	Culture	Penicillin per Day (in Oxford Units)	Sterile in Days	Result
1	Watery; 7 days	B. of Petit	195	4	Healed
2	" 13 "	<i>Staph. pyo.</i>	195	8	"
3	" 3 "	" "	195	10	"
4	" 4 mths.	" <i>albus</i>	195	12	"
5	" 1 mth.	" <i>pyo.</i>	195	8	"
6	" 3 days	" "	40	9	"
7	Purulent; 4 mths.	" "	130	18	"
8	Watery; 7 days	" "	195	4	"
9	" 5 wks.	" "	195	12	"
10	Purulent; 2 days	" "	195	5	Sterile

The history varied from 3 days to 4 months. There were 8 cases of *Staph. pyogenes*, 1 of *Staph. albus*, and 1 of the bacillus of Petit. Cases were given 160 units per day, and were healed in 9 days. Ulceration of the cornea healed rapidly in most cases, and the associated conjunctival condition became clear within 48 hours of starting treatment. The case which grew the bacillus of Petit responded to treatment, although it has already been proved that the organism is insensitive to penicillin.

#### Cases of Perforating Injury

Case	Type of Discharge and Duration	Culture	Penicillin per Day (in Oxford Units)	Sterile in Days	Result
1	Purulent; perforation 3 days	<i>Staph. pyo.</i>	360	9	Panoph (6 days later excision)
2	Purulent perforation 6 hours	" "	600	4	Clean (cyclitis; excision)
3	Purulent; perforation 5 days	<i>Staph. pyo.</i> ; diphtheroids	360	16	Clean (cyclitis; excision)
4	Perforation 12 hrs.; hypopyon	<i>Staph. albus</i>	130	17	Clean
5	Operation for cataracts; inspection 24 hours	Diphtheroids	360 (Irrigated AC)	33	Clear
6	Perforating injury; hypopyon	<i>Staph. pyo.</i>	600	4	Sterile
7	Burn of conjunctiva	" "	360	4	Clean
8	Sulphuric acid burns	<i>Str. haem.</i>	360	4	Sterile
9	Perforating injury	<i>Staph. pyo.</i>	360	6	"
10	Injury to R.E.; loss of eye with infected socket	" "	130	4	"
11	Superficial corneal abrasions	" "	130	2	Clean
12	Orbital wound	" "	130	3	"
13	Infected stitches; dacryocystorhinostomy	" "	130	3	"
14	Rupture of cornea	" "	100	4	"

In each case there was considerable infection of the cornea, with acute conjunctivitis; but, with penicillin, panophthalmitis was avoided in 5 cases out of 6. The organisms again were *Staph. pyogenes* in the majority of cases, and the conjunctival sac in each instance was made sterile in an average of 10 days. However, 3 cases required excision later owing to a chronic cyclitis.

There is no doubt that infected wounds which involve the eye, the orbit, or the lids react well to penicillin. Of these cases of perforating injury Case 1 was not available for treatment until 3 days after the injury, and intraocular infection had already started. Cases 2 and 3 had definite infections of the anterior chamber, which cleared up with penicillin,

although chronic cyclitis supervened. Cases 4, 5, and 6 all had hypopyon, which also disappeared under penicillin treatment. Case 8 was interesting, as to prevent symblepharon in the lower fornix a contact lens was made, and before this was fitted an acute streptococcal infection of the conjunctiva was completely controlled within 4 days. Irrigation of the anterior chamber was carried out in Cases 5 and 6, and these eyes would undoubtedly have been lost from panophthalmitis.

#### Cases of Dacryocystitis

Case	Type of Discharge and Duration	Culture	Penicillin per Day (in Oxford Units)	Sterile in Days	Result
1	Purulent; 3 years	Pneumococci; diphtheroids	420	9	Clean
2	Muco-purulent	Diphtheroids	420	7	"
3	Purulent	Pneumococci	420	5	Sterile

The 3 cases of dacryocystitis responded rapidly to treatment, and a sterile, clean lacrimal sac was noted within 5 to 9 days in each case. The infection was pneumococcal in 2 of the cases, and dacryocystorhinostomy was successfully performed in each instance, with clean healing wounds.

#### Treatment

It has been suggested that with a standard solution of 500 units per c.cm. the following dosage is adequate in the types of infection indicated:

**Blepharitis.**—One drop in each eye three times a day.

**Acute Conjunctivitis.**—One drop in the affected eye 4-hourly during the acute stage; later, three times a day.

**Corneal Ulceration.**—One drop in the ulcerated eye 4-hourly until clean; later, three times a day.

**Perforating Injuries.**—One drop in the injured eye half-hourly during the first 24 hours, and, if possible, instillation into the anterior chamber.

Treatment should be continued for 7 days after the first negative swab, or after clinical evidence of cure, in order to prevent relapse.

#### Summary and Conclusions

An attempt has been made to indicate the type of ophthalmic case that is suitable for treatment with penicillin and the dosage of the drug required. The following points arise from the investigation:

1. Penicillin holds a very important place in the treatment of ocular infections.

2. Compared with the dosages required in other branches of medicine and surgery, the amount necessary for the adequate treatment of all acute ocular infections in an ophthalmic unit is small.

3. It is effective against *Staph. aureus*, the haemolytic streptococcus, the pneumococcus, and the gonococcus.

4. It can be used in the form of drops or ointment, the best strength being 500 units per c.cm. Frequent applications are required in the initial stages of treatment. Experience has shown that treatment with drops is efficacious, and, on the whole, the drug is easier to apply by this means.

My best thanks are due to Group Capt. W. E. Barnes for his help and encouragement; to Prof. Florey and the Medical Research Council for the supplies of penicillin; and to Flight Lieut. Bodenham for his assistance in the treatment and his advice as to dosage.

Salaries of £65 a year rising by annual increments of £5 to £95 for assistant nurses and of £35 to £40 a year for probationers in non-training hospitals are recommended in the third report of the Taylor Committee on salaries of nurses in Scotland. Part I deals with salaries of those nurses not covered in the two earlier reports, including nurses on the new State list who receive the same as State-registered nurses; nurses above the grade of charge nurse in mental hospitals, who will have scales generally comparable with those in general hospitals; nurses in public assistance institutions and convalescent homes; cottage nurses; and orthopaedic nurses. Part II fills in certain gaps and amplifies or modifies scales for nurses in general, fever, children's, and maternity hospitals, in the domiciliary midwifery service, the public health service, and the district nursing service. Part III clears up some doubtful points of the earlier reports. The only matters now outstanding are superannuation, and salaries and conditions for nurses, up to the grade of charge nurse, in mental hospitals.

# CONTROL OF VERY SEVERE DIABETES BY A NEW ARRANGEMENT OF INSULINS

BY

R. D. LAWRENCE, M.D., F.R.C.P.

AND

WILFRID OAKLEY, M.D., F.R.C.P.

(The Diabetic Department, King's College Hospital)

Some cases of diabetes are so severe and so very difficult to control that it may be useful to describe a new method of treatment which we have found successful in many such cases in the past few years. We do not use "control" in the purist's sense of keeping the blood sugar normal and the urine sugar-free throughout the 24 hours, but merely of preventing the phases of intense glycosuria and ketonuria which occur daily when this type of case is treated along conventional lines. It is true that these phases are usually quite short, but, in the event of complications such as acute infection or gastrointestinal disturbance with vomiting, they may act as the starting-point of a more prolonged and serious relapse; this is particularly true of pregnant diabetics, in whom the tendency to ketosis is so often accentuated by a lowered renal threshold. It is also possible that these phases may, if sufficiently prolonged, be responsible for failure of growth and development in some children, whose instability is such as to make control by ordinary methods impossible.

Undoubtedly the best and most economical way of treating these very severe diabetes is with multiple injections of soluble insulin at four- or six-hourly intervals; but this is not practicable except over short periods of emergency, and we aim at the routine use of not more than two daily injections. The depot insulins, particularly P.Z.I., have made this possible in most, but not the exceptionally severe, cases. These require such high concentrations of insulin that protamine insulin with its slow absorption is almost useless, as it never liberates enough circulating insulin to be effective. In treating these very severe diabetes, therefore, we rely on soluble insulin to control the hyperglycaemia resulting from ingested carbohydrate, and use P.Z.I. to prevent, if possible, relapse due to endogenous sugar formation, particularly by night. In practice we arrange the insulin therapy for our severe cases in one of the following ways:

## Mixed Dose of Soluble Insulin and P.Z.I. in the Morning before Breakfast

This is the most convenient method, but is suitable chiefly for those moderately severe cases which neither require large doses of insulin nor relapse seriously when the soluble insulin has ceased to act and the patient depends on P.Z.I. alone—namely, in the late afternoon, night, and early morning. Heavy glycosuria is common after the evening meal on this regime, but is usually of short duration and of no clinical importance. The insulins are given together in the same syringe and the correct proportions worked out for each case, the dose of soluble insulin being usually larger than that of P.Z.I. to allow for the precipitation of some of the former by the excess protamine present in the latter. In very severe cases, however, this method may completely fail to control the diabetes, hyperglycaemia being persistently present, with heavy

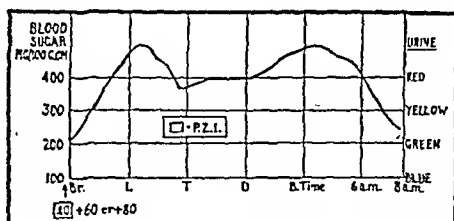


FIG. 1.—Very severe case (temporary or permanent).

glycosuria and ketosis in the morning and possibly also at night. The P.Z.I. appears only to detract from the action of the soluble insulin without exerting much effective action of its own (see Fig. 1).

## Mixed Dose of Soluble Insulin and P.Z.I. before Breakfast and Soluble Insulin before Dinner or Supper

This arrangement probably gives the best control possible by two injections in the majority of severe cases. The addition of a small injection of soluble insulin towards the end of the day prevents the evening relapse, and we think is best given, if possible, at about 5 or 6 p.m., so that its action may be nearly over before bedtime. This timing of injections is particularly suitable for children and others who combine their tea and evening meal. While this method is an undoubted improvement on the first for very severe cases, it may fail for the same reasons. The evening soluble insulin may prevent heavy nocturnal glycosuria and frequency, but does not act long enough to prevent a relapse by the morning, after which hyperglycaemia again tends to persist throughout the day (see Fig. 2). One advantage of this method is that the need

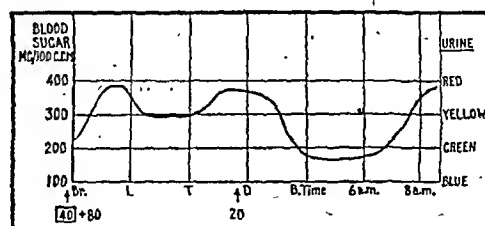


FIG. 2.

for an evening dose may be only temporary and it can be stopped later without an entire rearrangement of the treatment.

## Morning and Evening Injections of Soluble Insulin

In spite of the many advantages of depot insulin this method remains a most satisfactory one in many severe diabetes. Its advantages are simplicity and adaptability, which make it particularly suitable for those whose activities and meals are apt to be irregular. Again, however, in very severe cases, and especially those who are highly insulin-sensitive, this method is liable to fail on account of its tendency to produce a swinging blood sugar and, unless large buffer meals are included in the diet, severe hypoglycaemic reactions alternating with periods of intense hyperglycaemia and ketosis. This tendency constitutes a particular problem at night, when the danger of nocturnal hypoglycaemia can only be avoided at the cost of a very high fasting blood sugar, often accompanied by heavy ketosis in the morning (Fig. 3). It was in an endeavour

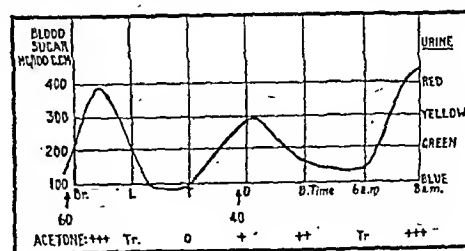


FIG. 3

to overcome this serious drawback to the use of two injections of soluble insulin in severe diabetes that we decided to try a new arrangement of soluble insulin and P.Z.I.

## Morning Soluble and Evening Mixed Soluble and P.Z.I.

This method has certain advantages, both in theory and in practical effects, over those already described. The use of soluble insulin alone in the morning gives a strong rapid insulin action at a time when it is chiefly needed, whereas when given with P.Z.I. a certain proportion of the soluble insulin is converted into protamine insulin, necessitating a considerably larger dose of soluble to produce the same prompt effect. If this is remembered, together with the fact that P.Z.I. may be almost without effective action in some severe cases, it will be seen that enormous mixed doses may be given in the morning to such cases with no greater benefit



than may result from a comparatively small dose of soluble insulin given alone. We have demonstrated the truth of this observation in a number of our cases by withdrawing suddenly from the morning mixed dose all the P.Z.I., amounting to 30 or 40 units or more, the only result being a lowering of the noon blood sugar. Such cases are exceptional, but their existence should be remembered whenever very large doses of P.Z.I. appear to be having little or no action.

The use of a mixed dose at night might in theory be expected to prevent a high fasting blood sugar and morning ketosis, and also possibly to exert some mild hypoglycaemic action on the following day, especially before meals. The only real danger would appear to be the possibility of nocturnal hypoglycaemia, and, to avoid this, the dose of P.Z.I. should be kept relatively low and always less than that of the soluble insulin given with it.

Experience of this method of treatment in some 100 cases of the very severe type, all of which had high fasting blood sugars and morning ketosis on other regimes, has confirmed, in our opinion, the theoretical advantages put forward, and convinced us that the addition of a small dose of P.Z.I. to the evening injection of soluble insulin does in fact result in the lowering of the fasting blood sugar, with consequent decrease in morning insulin requirement, and disappearance of ketone bodies from the early morning specimen of urine (Fig. 4). Treatment along these lines has been particularly

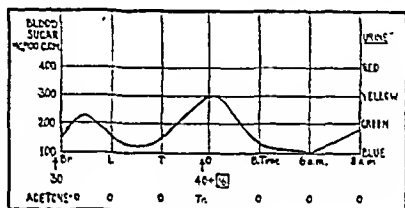


FIG. 4

successful in pregnant diabetics, several of whom have asked to continue on an evening mixed dose after delivery.

We have also had good results in a number of children, but, although we have seen little or no nocturnal hypoglycaemia in any of the cases so treated, we feel that particular care should be taken to avoid this in children by using the smallest effective evening dose of P.Z.I. and always giving an adequate bedtime feed. We have tried similar small doses of P.Z.I. with the morning soluble insulin to try to prevent relapse in the late afternoon, but with less success.

## Medical Memoranda

### Traumatic Perforation of the Appendix

Perforation of the appendix is common enough in itself, but when due solely to trauma is very unusual. Such a case was seen recently, and is considered worth recording.

#### CASE HISTORY

A Canadian soldier aged 20 was admitted to hospital at 11 a.m. on Nov. 9, 1942, with the following history: At 8 a.m. he had been crushed between a wall and a slowly moving lorry; his abdomen, more particularly the upper part, bearing the brunt of the injury. He did not lose consciousness, but complained immediately of abdominal pain, mainly epigastric.

On examination the patient was seen to be a well-developed, robust young man. His colour was good, but he complained of abdominal pain, especially in the upper abdomen. There was neither nausea nor vomiting; no food had been taken since the accident, nor had morphine been administered. His temperature was 98°, pulse 80, and respirations 20. The abdomen showed no signs of contusion or any abrasions and moved fairly well on respiration. There was diffuse tenderness, but of only moderate degree and most

An equally diffuse, but slight, degree of rigidity, but no true rigidity. Release to a slight degree over the whole abdomen. There was no evidence of free fluid in the peritoneum, liver dullness was unimpaired, while peristaltic sounds were excep-

tionally prominent; no shoulder-tip pain was felt. Rectal examination revealed nothing; neither did clinical examination of the chest. There was no bony tenderness or any other sign of a fracture. A provisional diagnosis of contused abdominal wall was made and a conservative attitude adopted.

One hour later the pulse was 60 and of very good volume, but otherwise the patient's condition was unchanged. During the afternoon the pulse rose gradually until it reached 80 by 5 p.m. He was also complaining of hypogastric pain, apparently due to a full bladder, no urine having been voided since the accident. A catheter was passed easily, and a specimen of normal urine was obtained, showing there was no lesion of the urinary tract. Still no change was observed in the abdominal signs, but the rising pulse—the volume not quite so good as at first—was causing some anxiety, so it was decided to explore the abdomen unless the clinical condition showed a marked improvement in the next hour or so. No improvement occurred, and at 7 p.m. the temperature rose suddenly to 101°.

At 8 p.m. a laparotomy was begun under gas-oxygen-ether anaesthesia. A right paramedian incision was employed; no blood or intestinal contents could be seen in the peritoneal cavity. On the small intestine were numerous abrasions where the serous covering had been injured, but there were no perforations or any evidence of loss of vitality. A tear 3 in. long was found in the mesentery at the ileo-caecal junction. It was at right angles to the gut, but produced no visible effect on it; one fairly large artery had been torn across, without haemorrhage at the time of injury, though some occurred while manipulating the bowel. The artery was tied and the rent in the mesentery sutured. At this stage a detached appendix epiploica and a small piece of faecal matter were found in the pelvis. Examination revealed that the perforation of the large bowel was confined to the tip of the appendix, while the appendix epiploica appeared to be from the pelvic colon.

The appendix itself was about 5 in. long, very mobile—being actually discovered just above the pelvic brim—and devoid of any sign of inflammation. At the tip was an irregular perforation about 1/3 in. in length. Treatment presented no problems and the appendix was removed in the usual way. The abdomen was closed and a rubber dam drain left in the peritoneum for 48 hours.

Intravenous saline was started, 1/4 gr. of morphine was given 6-hourly, and a Ryle tube was placed in the stomach and aspirated every hour. Soluble sulphapyridine was given intravenously—2 g. followed by 1 g. 4-hourly for 72 hours.

During the first few days after the operation the abdomen was distended and very silent, suggesting that there was some peritoneal inflammation, which was not unexpected. Thereafter a mass developed in the pelvis, but this resolved without surgical intervention, and the patient made slow but steady progress, being discharged to a convalescent home 6 weeks after the operation.

### DISCUSSION

Since the days when acute appendicitis became common the position of trauma as an aetiological factor has constantly been under review. It was first thought that trauma never caused acute appendicitis, but it is gradually being accepted that it may occasionally bring on an attack. As Maes and McFeiridge (1935) wrote, the exact mechanism of traumatic appendicitis has never been satisfactorily established. There is no previous case on record of rupture or even bruising of the appendix. It had also never been scientifically proved, operation usually not being early enough to detect evidence of trauma before obliteration by inflammation. Ludington in 1923 described acute appendicitis in a girl aged 10, with rupture of all anatomical coats in an appendix distal to an adhesion, 30 hours after a fall. McCarthy and Magrath in 1938 reported two cases in which the appendix and mesentery were torn away from the caecum.

The case recorded above may shed some light on the controversy, as the appendix was free from previous disease and uninfamed, and the rupture was obviously due to trauma. This injury, or one in which the coats are damaged and not ruptured, could produce a spreading inflammation of the appendix. The case also proves conclusively that the appendix can be injured without serious damage to any other viscus.

I wish to thank Col. J. M. Elliott, Army Medical Services, for permission to publish this case.

A. F. WILLIAMS, M.B., F.R.C.S.,  
Capt., R.A.M.C.

#### REFERENCES

- Ludington, N. A. (1923) *J. Amer. med. Ass.*, 80, 1448.  
McCarthy, P. A., and Magrath, J. L. (1938). *Amer. J. Surg.*, 39, 148.  
Maes, U., and McFeiridge, E. M. (1935). *Ibid.*, 30, 478.

R. A. Palmer and H. S. Mitchell (*Canad. med. Ass. J.*, 1943, 49, 465) record two cases of march haemoglobinuria in soldiers aged 19 and 21. Its pathogenesis is still unknown, but they suggest that the paroxysms are not due to increased haemolysis but to some unknown abnormality present during erect exertion interfering with the clearing from the plasma of the haemoglobin liberated in the normal destruction of senile erythrocytes.

## Reviews

### ENDOCRINOLOGY OF CHILDHOOD

*Endocrine Disorders in Childhood and Adolescence.* By H. S. Le Marquand, M.D., M.R.C.P., and F. H. W. Tozer, M.D., M.R.C.P. (Pp. 298; illustrated. 15s.) London: Hodder and Stoughton. 1943.

How recent is the interest taken in the endocrinology of childhood is shown by the fact that neither the word "pituitary" nor "endocrine" appears in the index of the 1924 edition of a well-known textbook of children's diseases. Yet the endocrine system asserts itself before birth and is actively concerned with growth—the conspicuous feature of early life. We welcome, therefore, this book on *Endocrine Disorders in Childhood and Adolescence*, by Dr. H. S. Le Marquand and Dr. F. H. W. Tozer, as a valuable contribution to the subject. They have assimilated the literature and tested the conclusions thereof in the light of their own clinical observations. Like most recent observers, they are increasingly struck by the predominant role of the pituitary and its close association with the hypothalamic centres. Yet they find that pituitary disorders, though relatively common, are often unrecognized. Valuable evidence may be obtained by seeing other members of the family, and they are impressed with the frequency with which "problem children" present minor stigmata of endocrine imbalance. The complexity of conditions arising can only be attributed to a dissociation of pituitary functions, and in the chapter on the physiology of the endocrine system the vexed question is discussed whether each of these manifold functions has its own specific hormone, or whether (as Collip believes) there are not more than three hormones, modified as required by the needs of the body. That these tiny glands containing only three types of cells should elaborate at least eleven specific substances, some of which, such as the lactogenic, may never function throughout life, seems highly improbable. The work of the organic chemist showing what profound changes in action may result from slight changes in chemical constitution certainly adds point to Collip's view. The close interrelation between all the endocrine glands is insisted on, which is particularly obvious in the case of the pituitary and the gonads. The descriptions of the various clinical syndromes are lucid, and the discussions of them maintain a nice balance between dogmatism and scepticism. A number of photographs illustrate some of the cases under the care of the authors, and a useful table of the commercial preparations of sex hormones is appended.

Although the psychological basis of anorexia nervosa as distinct from organic defects in the anterior pituitary is realized, the advocacy of energetic endocrine treatment, if evidence of hypogonadism be found, may tempt some practitioners to carry out to the neglect of the more troublesome and delicate essential psychological factor. This is the only criticism we have to make of an admirable account of endocrine disorders in early life and one which imparts much information in a reasonable compass.

### X-RAY DIAGNOSIS

*Outline of Roentgen Diagnosis.* By Leo G. Rigler, B.S., M.D. Second edition (Pp. 196; illustrated. 40s.) London: J. B. Lippincott Company. 1943.

The second edition of Leo G. Rigler's *Outline of Roentgen Diagnosis* is, like the first, based on lecture notes prepared by him for undergraduate teaching. These notes, revised, expanded, and now published in book form, are designed, according to the preface, "as a supplement to diagnostic lectures to undergraduates, as a text in teaching extension courses to general practitioners, as a study outline for graduate students, and, by radiologists, as a synopsis for lectures." It is, in effect, a synopsis of x-ray diagnosis, and exhibits both the virtues (if there be virtues) and the faults of such works. The text occupies 196 pages; the illustrations—227 in all—are grouped in a series of plates at the end. In conformity with the object of the book, radiographic technique has been omitted.

The text is well arranged, but tends too much to be a catalogue of x-ray signs, and fails, like most synopses, to assess the value of the sign, or to indicate its significance in relation

to the pathological process or disturbance of function. There are a number of errors and omissions in the text—for example, the statement that in the female the fifth lumbar vertebra rises high above the crest of the *sacrum*; even correcting the *lapsus calami* this is not true. Again, the author states that "the [x-ray] diagnosis of either acute or chronic mastoiditis can be made with great certainty, especially if it is one-sided"—an enthusiastic claim, to say the least of it. In discussing the position of a Colles's fracture no mention is made of the inclination of the radial articular surface in the lateral view, and in describing the signs of acute maxillary sinusitis the fluid level is omitted. In atelectasis of the lower lobe of the lung the retrocardiac triangular shadow is not mentioned, nor is any account given of the signs of atelectasis in the other lobes. An unhappy word, "radiability," is used throughout the book when describing the translucency of a structure to x rays. If it means anything the word would indicate the capacity of the structure to radiate.

The half-tone illustrations of radiographs are of good quality and well chosen to illustrate the commoner conditions. The line diagrams are excellent. Mention should be made of a novel feature in the illustrations of bone lesions drawn by Miss Hersch. These are very successful in combining in one drawing the salient features of the lesions illustrated.

While this book is too compressed to be of much value to the real student of radiodiagnosis it may commend itself to those undergraduates who require a concise outline of a large subject. Of itself it may fail to give them the most essential feature—a real perspective of the subject.

### APPLIED CHEMISTRY

*Thorpe's Dictionary of Applied Chemistry.* By the late Jocelyn Field Thorpe, D.Sc., F.R.S., and M. A. Whiteley, D.Sc. Fourth edition, revised and enlarged. Vol. VI; with an Index to Vols. I to VI by Dr. J. N. Goldsmith. (Pp. 611. 80s.) London: Longmans, Green and Co. 1943.

A full appraisal of *Thorpe's Dictionary of Applied Chemistry* would call for its review in many different aspects. Under the title of 'helium, for example, there is found first a detailed history, with an account of its geographical distribution; next there is what amounts to a treatise on low-temperature physics with data relating to the remarkable properties and behaviour manifested in the neighbourhood of absolute zero; and in a calendar of general information we are given an account of the uses of helium—among which is its increasing medical application. In certain types of respiratory obstruction it is found that a mixture of helium and oxygen is easier to breathe than the corresponding nitrogen mixture and diminishes muscular effort. The same mixture is advantageous as a supply to divers, reducing the liability to "divers' bends." This monograph on helium is descriptive of the pattern of all. The range of subjects covered by Thorpe's dictionary is extensive and includes a great diversity of kind. An instance of this diversity is shown by the appearance of a monograph describing the practice of dyeing human hair and explaining the chemical nature and action of the dyes used for the purpose. There are monographs on the ideal or perfect gas, on interatomic distances, and on high-pressure reactions. The diversity of subjects is matched by the diversity of authorship of the monographs. As the sources of authoritative knowledge the names of more than sixty well-known scientists appear in the list of contributors to the pages of this volume.

The dictionary is a credit to the contributors, to the editors and others engaged in its production, and is worthy of the place it fills in English chemical literature.

### Notes on Books

*The Handbook of Tropical Medicine*, by Drs. ALFRED C. REEL and J. C. GEIGER (Oxford University Press; 9s. 6d.) is small enough to be carried conveniently in the pocket. It differs from the usual run of books on tropical medicine in that it confines itself almost entirely to the clinical features of tropical diseases, their diagnosis, treatment, and prevention. There are no lengthy descriptions of the life-histories of the parasites concerned, nor are there any illustrations. The little book is essentially one for the clinician who is given all essential information for the handling and treatment of his cases. It is well written and remarkably free from inaccuracies, and it deals with all the important tropical diseases

which it is unnecessary to enumerate here. Anyone going to the Tropics or having to handle patients from the Tropics cannot do better than arm himself with this admirable little book.

Two articles from the *Approved Schools Gazette* have been reprinted in pamphlet form: one is entitled "Nocturnal Enuresis in Institutions for Children," by Dr. A. H. Norris, ex-chief inspector, Children's Branch, Home Office; and the other is a short addendum by Dr. A. E. Carver, psychiatrist-in-charge, Nuneaton Child Guidance Clinic. Dr. Norris suggests that any medical man applying to the Chief Inspector, Children's Branch, Home Office, Whitehall, S.W., would be sent a copy. His object in writing the article was to give workers in residential schools some guidance for helping the child on sound and safe lines. The advice is based on long experience of children in hospitals or sanatoria, while working as the medical officer of an education committee, and particularly through visits paid to several hundred residential schools and homes for children.

The Child Welfare Department of University College Hospital, London, has prepared a leaflet, *The Care of Your New Baby*, for mothers to take home with them when they leave hospital with their babies. It is not intended as a substitute for regular attendance at the local child welfare centre. Copies (price 2d.) can be obtained from the Secretary, University College Hospital, Gower Street, W.C.1, or from H. K. Lewis and Co., 136, Gower Street.

## Preparations and Appliances

### INTRAVENOUS ANAESTHESIA BY GRAVITY-FEED APPARATUS

Dr. J. L. GRIFFIN, honorary anaesthetist, Taunton Hospital, writes:

When intravenous anaesthesia was first introduced it was hailed as the coming anaesthetic, but since the technique of administration was imperfect, fatalities occurred, and it came to be considered dangerous for any but short operations in the healthy young adult. This was largely due to two causes: (1) administration by the inexperienced with frequently no means of resuscitation at hand; (2) the thoroughly bad practice of giving a large pre-judged dose of the drug rapidly in order to obtain deep anaesthesia for a short period.

Intravenous anaesthesia is now becoming more widely used every day for major as well as minor surgery, including cases previously thought unsuitable. Its chief advantages are: *To the Surgeon*—(1) quiet respiration, (2) efficient relaxation, (3) less haemorrhage; *To the Anaesthetist*—(1) rapid induction, (2) absence of second-stage complications, (3) a relaxed jaw and fewer difficulties with the air-way in consequence, (4) a slow, steady pulse rate with only a slight fall in blood pressure; *To the Patient*—(1) no mask over the face, (2) a rapid black-out, (3) post-operative vomiting rare, (4) an awakening as from natural sleep. If it can be given in carefully graduated doses throughout the operation—supplemented if required with gas-and-oxygen—it approaches the ideal.

Below is a description and illustration of an apparatus for its continuous administration, with saline (in use at Taunton Hospital), which I hope will be of interest to anaesthetists.

#### The Apparatus

It may be conveniently described in two parts: (1) A metal upright tube which is fastened to the left rear leg of the table Boyle's or other anaesthetic trolley. This carries a fibre panel which is adjustable to height and distance from the upright, enabling it to be placed over either the table or the patient's arm. The panel supports spring holders for the funnels and large fine-adjustment screw-clips (Baird and Tatlock). It has also a three-legged stand for use where there is no convenient table. (2) The sterilizable part of the apparatus, which consists of two graduated glass funnels (Allen and Hanburys) with bakelite covers, one to hold 300 c.cm. saline and the other 40 c.cm. of the anaesthetic solution. The rubber tubes leading from these funnels pass through the screw-clips and are joined by a glass U-tube to a single drip the lower end of which is tapered to take the fine-bore tubing (2 mm.) which leads in turn to a fine glass indicator and intravenous needle.

#### Technique

The patient, if an adult, receives 2 oz. glucose in water three hours before operation, 1/3 gr. omnopon plus 1/150 gr. scopolamine one hour before. This reduces any toxic effect and also the total dose required—e.g., an operation, fascial repair of obturator hernia, lasting 24 hours, required only 1½ g. pentothal.

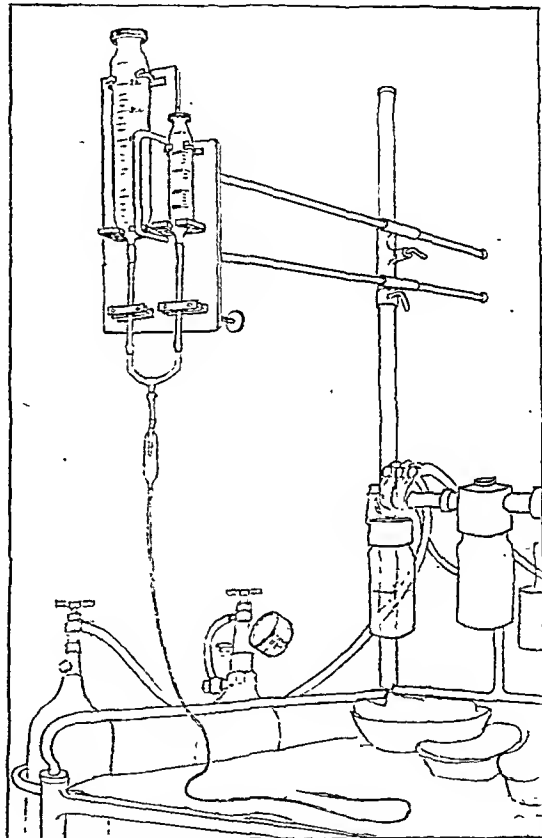
The glass and tubing parts, having been assembled and sterilized in a small partitioned bag, are attached to the panel. A sterile towel is placed on the table with the usual equipment for preparing the

anaesthetic solution (usually 40 c.cm. of a 2½% solution of pentothal with 3 c.cm. of coramine). The funnels having been filled, the screw-clip on the saline tube is turned on to expel the air and fill the fine-bore tubing, and then turned off. The clip on the anaesthetic tube is then turned on and off to ensure its subsequent smooth working.

The patient's right arm is secured to a splint and an aneroid type sphygmomanometer used, first to check blood pressure, then to make the veins prominent. This is preferable to a bandage or tubing, as correct pressure can be maintained until the needle is shown by the glass indicator to be in the vein.

The saline is started, the arm pressure released, and the needle strapped by adhesive tape to the arm. The anaesthetic solution is given in doses as follows:

The saline is turned off, the anaesthetic turned on, and the drip and graduations watched until the required amount has been given. The anaesthetic is then turned off and the saline recommenced. This avoids any backwash or tendency to levelling of the fluids in the funnels if both were turned on together.



#### Advantages of the Apparatus

1. It forms a single stable unit with the Boyle's, and is in no one's way.
2. It obviates the need for an assistant to hold the jaw and leaves the anaesthetist free to give gas-and-oxygen and the necessary doses of the intravenous anaesthetic simultaneously.
3. Because of the fine-bore tubing and tapered drip the dead space is reduced to 3 c.cm. and the effect of each dose is obtained in about 50 seconds, giving minute-to-minute controllability.
4. The administration of saline and coramine intravenously minimizes the slight fall in blood pressure. Plasma may be given later through the same needle (No. 1 hypodermic, short bevel).
5. There is no loss of time between cases, or waste of anaesthetic, as the apparatus may be used throughout an operating session; all that is necessary is to change the fine tubing, indicator, and needle between cases. Sets of these may be ready sterilized.
6. With such a gravity-fed apparatus there is no risk of air or oxygen embolism as there may be with a pressure-fed apparatus.

I am greatly indebted to Mr. Hassan (motor engineer), who kindly constructed the metal parts, and to M. Muers, Ph.D., who designed the glass and tubing.

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## THE WHITE PAPER DEBATE

The scanty attendance in the House of Commons during the debate on the White Paper last week was, we believe, a measure of the general lack of interest in the country as a whole in a matter which concerns it profoundly. The facts that Left-wing speakers commended the White Paper and determined to resist any attempt to whittle it down, and that Conservative speakers offered to support doctors in their opposition to some of the proposals in the Paper, clearly showed that the political drift was in the direction of socialization of medicine, and confirmed the tentative deductions made in these columns a week after the Paper was published. Although the political implications of the White Paper are those which are likely to arouse distrust in what is probably a predominantly conservative profession, doctors must take into account the generally favourable reception given by members of all parties in both Houses of Parliament to the present proposals for a comprehensive medical service. The more moderate organs of the Press, too, have welcomed the White Paper as embodying statesmanlike proposals for the reform of medicine. For example, the *Times* observes: "It is also necessary for all parties and interests to face the fundamental truth that, if the needs of the community are to be met, medical resources of all kinds, including general practitioners and specialists, must be available to different areas and different individuals according to their medical requirements and not according to their purchasing power. . . . No fair distribution of skill and resources is possible without some form of public planning. . . ." So if we may judge from the reactions of the Press and of Parliament the medical profession will get little public sympathy for any root-and-branch resistance to the White Paper proposals as a whole. There is, however, full recognition of the need for discussion on detail, and, we believe, a readiness on the part of Parliament to listen attentively to expert medical opinion on the many aspects of a contemplated legislative measure which, while not necessarily changing the face of medicine, bids fair to put a new and different complexion on it.

Mr. Willink, Minister of Health, said that the White Paper was built round four main principles which the Government believed to be fundamental: (1) comprehensiveness; (2) the freedom of the individual (no dragooning of patient or doctor into the service); (3) democratic responsibility—i.e., responsibility for the service to rest centrally and locally with the elected representatives; (4) the principle of professional and vocational guidance. Among the main features of the actual organization he stressed the principle of free choice of doctor (subsequently ridiculed by many of the Left-wing speakers): a desire to avoid regiment-

ation: no intention on the part of the Government to establish "a fully salaried State Medical Service"; no prohibition of private practice; apprenticeship for young doctors first entering on general practice; rationalization of the hospital services; and, lastly, "we have no doubt that the foundation of this scheme should be in local government." Mr. Willink was at pains to remove the profession's natural apprehensions about the meaning of the sentence at page 35 of the White Paper, which runs as follows: "The Board must also be able to require the young doctor during the early years of his career to give his full time to the public service where the needs of the service require this." One misapprehension arose from the fact that in the shorter version the word "when" appeared instead of the word "where": it should read "where" in both places. Mr. Willink then proposed an alternative phraseology, as follows: "The Board must also be able to require a young doctor entering the public service to give his full time to that service during the early years of his career in cases where the needs of the service require this." On the second day of the debate the Parliamentary Secretary to the Ministry of Health, Miss Horsbrugh, carried clarification a stage further by pointing out that it might not be possible for a young man to do part-time private and part-time public practice in a certain area; but this would not prevent his applying for such part-time work in other parts of the country. She instanced Mr. Willink's case of the young doctor wanting to work in Wakefield. His application for part-time work might be met thus: "We are short of doctors in Wakefield; therefore we must ask you to do full-time public practice. If you do not want to do full-time public practice, or full-time private practice, there are many other places in England and Wales where there are openings for doctors who want to do part-time private and part-time public practice."

The administrative proposals came in for much pertinent criticism, summed up in Lord Moran's phrase: "There is not one medical service, there are to be six. . . ." In spite of all the arguments in the White Paper, it cannot be said that the principle of comprehensiveness has been observed, and a Liberal speaker (Mr. Graham White) in the Commons regretted that the opportunity had not been taken to make "the Minister of Health really Minister of Health for the whole country, (and) giving him the control . . . of industrial health and also the school medical service." Mr. White also criticized the central administrative body—presumably meaning the Central Medical Board—as having a tendency to "become a close corporation and develop a Fascist tendency." In Lord Moran's view the functions of the Central Medical Board were more controversial than all the rest of the White Paper put together. The proposed powers of civil direction in time of peace were most unusual, and he thought it not irrelevant to ask the Government whether they intended to apply similar powers to other sections of the community. If the Board was to have the confidence of the profession, then some at any rate of its members should be elected by the profession. He thought that in order to avoid

splitting the profession into two the Central Medical Board should have a general practice section and a section for the consultant and specialist. The fears of the profession generally about the Central Medical Board were well expressed in the Commons by Dr. Morgan, and he voiced a common attitude when he said: "In all the services run by the Government there seems to be a blight to keep the doctors down and keep them [from] developing that initiative which they want to develop." He was afraid of the directionary powers of the Central Medical Board and wondered, for example, whether it might not send a young doctor into a bad practice, or into general practice when he might be better fitted to be a specialist. Not even the explanations of Mr. Willink and Miss Horsburgh about the fate of the young doctor of Wakefield could remove from the mind of Parliament the distrust felt towards the Central Medical Board. In Lord Dawson's words: "There is no body more in danger of becoming bureaucratic. . . ."

Health centres came in for their meed of praise and blame. The Government has its preference for paying health centre doctors by salary and for removing the competitive element among health centre doctors. This may be sound administration, but we doubt whether it is sound biology. Lord Moran considered that doctors who qualify after the war will prefer to work at health centres, and anticipated that "in no distant time the great majority of the younger men in the profession will be working in these health centres, working on salary because that is the means of remuneration proposed for the health centres." The result of this would be that the greater part of the profession would be removed from a life where rewards were conditioned by success in practice, and would be working in a service where rewards would bear little relation to professional success. "I think," he added, "it would be advisable to have some material stimulant to keep men on their toes." Nevertheless he thought that the centres would provide opportunities for work for the practitioner which had not existed in the past, and that they would make for greater efficiency. Reward for effort was also emphasized in the Commons by Dr. Howitt: "If you do not make a doctor's life attractive; if you do not allow him initiative and enterprise and a reward for hard and good work, you will not attract into the profession the people you want to attract."

The effect of the White Paper upon the position of the voluntary hospitals was discussed at length in both Chambers. Mr. Storey echoed the fears of many when he suggested that the White Paper proposals had been so framed as to make it possible at no far-distant date to acquire the voluntary hospitals and build them into a full State service. "The essence of a voluntary hospital," he observed, "is not its charitable funds but its tradition, its experience, the facilities it offers for independent experiment, independent research, and individual teaching, and also the opportunities which it offers for voluntary public service." There was little doubt in most of the speakers' minds about the effect of the new proposals on the financial stability of the voluntary hospitals. One member wanted to see grants to voluntary hospitals

administered in much the same way as a University Grants Committee makes payment to a university. Another member suggested that present members of contributory schemes should have the right "to earmark their taxation contributions, if they wish, for their hospitals contributory scheme." Fears for the finance of the voluntary hospitals are really fears for the control of these hospitals, because once the bulk of the money for the voluntary hospitals comes through local authorities—i.e., the new Joint Boards—they will insist upon a greater say in the control of the hospitals. In this connexion we would draw attention to remarks made by Dr. Howard E. Collier in a letter published in the *Supplement* of March 11. He asks: "Is the sole difference between a voluntary and a 'State' hospital the source from which its finances are derived? Has the voluntary principle contributed nothing of value to our hospitals except hard cash?" Dr. Collier suggests that the fact that a hospital is administered by a voluntary committee should not prevent it from receiving State money. What medical men wish to secure is professional freedom in a hospital, and this they get from voluntary administration. Such an atmosphere makes for full exercise of individual medical responsibility, and it is this which is of such importance for the patient. The principle of administration of the municipal hospital is different, and in the view of many discourages initiative and dampens the sense of responsibility on the part of the doctors working in it. As Lord Dawson wisely observed, "We do not place our claim for the voluntary hospitals merely upon sentiment."

The great merit of the White Paper is that it leaves plenty of room for discussion and negotiation, and Government spokesmen have already shown a readiness to take into full account the point of view of the profession on professional matters. The medical profession may well reflect upon the remarks made by Lord Samuel. The White Paper, he observed, "deals with one large part of what is the great political problem of our time." This problem was, how far State action should extend in industry, commerce, education, and health. In the nineteenth century this country had to deal largely with questions of constitutional reform and the establishment of full self-government. To-day the view of the country was that the part played by the State could not be decided according to the formula of individualism or the formula of socialism; there must be a combination of both. And this, we may add, would seem to be the line of thought behind the White Paper.

### LESSONS FROM THE BOSTON FIRE

When 114 victims of the Cocoanut Grove fire in Boston were brought to the Massachusetts General Hospital the staff were ready not only with an organization inspired by Pearl Harbour for dealing with a large influx of casualties but also with a clear-cut programme for the treatment of burns, on which two research projects were running at the time. The experience of the various departments of the hospital is recorded in a symposium of fifteen papers,<sup>1</sup>

<sup>1</sup> *Ann. Surg.*, 1943, 117, 801.



from which, out of a wealth of detail, a few facts of general interest emerge. As is to be expected when large numbers of people are subjected to the same physical violence, the injuries conformed to a pattern. The most obvious feature was the superficial burning, more extensive in women than men owing to differences in clothing; but of greater consequence were the accompanying respiratory lesions due to inhalation of flame or gases. The burns were of the type known as flash burns—i.e., brief exposure to high temperature—and the distribution of the burns bore striking testimony to the protection afforded by ordinary clothing against this kind of burn. Flash burns are common in warfare and often occur in circumstances in which respiratory complications are likely, so this aspect of the disaster is of special interest now. Although there was panic in the night club, none of the M.G.H. cases were found to have fractures. The conformity of the injuries to a pattern must not be forgotten if any attempt is made to compare the results of treatment with those obtained in other circumstances. In this connexion it is worth noting the speed with which the victims were got to hospital and the absence of treatment before admission.

Altogether 491 persons lost their lives in the disaster, and only 181 of the injured reached hospital alive, 39 of them dying later. The high proportion of dead to injured—of 114 victims brought to the M.G.H. only 39 were alive—clearly shows that there was at work some factor other than burning, which was for the most part superficial. This was early realized by the staff of the hospital, and the cherry-red colour of carbon monoxide poisoning was noted in some victims on admission. In view of the high death rate the paucity of post-mortem reports in the symposium is disappointing. It is true that a few are given in detail, but one gathers that only six were performed at the M.G.H. and a further sixteen in other parts of the city. If it is assumed that these are representative, the deduction follows that nearly all the fatalities were due to respiratory lesions—either burning of the air passages or asphyxia. There is nothing to indicate whether any of the asphyxial cases were of the type seen in the shelter disaster in this city. Of more practical interest than the asphyxial cases were those with burns of the air passages, for these presented a serious problem in treatment. An early observation was that patients with respiratory complications did not all respond to sedation with morphine. It is suggested that hyperactivity or even delirium may be due to cerebral anoxia, and two patients were promptly quieted by oxygen inhalation: for these patients morphine may be harmful. A few hours after the fire a number of cases developed dyspnoea, which had not been present on admission. This was attributed to the appearance of oedema in the respiratory burns comparable to that seen in burns of the skin. About twenty-four hours after the fire dyspnoea and cyanosis became worse in some of the cases, and in several tracheotomy or intubation was performed. Only two patients out of five treated by tracheotomy survived, and seven in all died in this stage. In three cases post-mortem examination showed that the lesions were too extensive to be relieved by tracheotomy—membranous inflammation extending into the smaller bronchi. The cause of this

change was in doubt, but it was thought to be the inhalation of toxic fumes. At a later stage the picture was of migratory atelectasis and emphysema due to obstructive bronchiolitis. One of the more important conclusions from this experience of pulmonary complications is that the degree of inhalation burn could not be ascertained immediately after the injury, and that the extreme oedema of the air passages that occurred in some cases was unpredictable. It is urged that great vigilance is needed for attacks of oedema even in patients with minimal surface burns.

The treatment of the surface burns consisted of no débridement, no cleansing, boric ointment dressings, and internal chemotherapy. In addition burns of the face, scalp, and extremities were bandaged with pressure. The dressings were not changed until the fifth to the tenth day, and in the case of superficial burns no other treatment was used. For chemotherapy sulphadiazine was given, and a previous observation that the concentration of drug in blister fluid of the burns follows closely that of the blood was confirmed. Thirteen patients were treated with penicillin by injection: most of these were cases in which the temperature remained raised after the sixth day. No claims are made for the value of this treatment, in which the dosage was afterwards thought to be too small. It is difficult to assess the results of the treatment of surface burns, but the staff of the M.G.H. thought them gratifying. Though bacteriological studies showed that most of the burns were infected, the second-degree burns healed without clinical evidence of infection and with minimal scarring. The deep burns remained unusually free of invasive infection. Whatever may be thought of this method as a routine treatment of surface burns, there is no doubt that in this particular disaster, with its high incidence of pulmonary lesions, it had great advantages. The minimal interference with surface lesions accorded well with the treatment of shock and asphyxia. It is to be hoped that information will be forthcoming about the fate of the 142 victims taken to other hospitals in Boston: 110 of them survived. There should be ample material for comparison with the experience of the Massachusetts General Hospital, whose staff have done real service in preparing this symposium.

#### PENICILLIN IN VENEREAL DISEASE

It is already well known that penicillin will cure uncomplicated gonorrhoea with a rapidity and certainty unapproached by any other form of treatment. This was to be expected from the *in vitro* observations made by the Oxford workers<sup>1</sup> in 1941: the gonococcus heads their list of pathogenic bacteria given in the order of their sensitivity to penicillin in culture. Clinical confirmation of this effect was first obtained in the U.S.A.,<sup>2</sup> and repeated in a small number of cases in the British Army in North Africa.<sup>3</sup> The necessary treatment for a man consists of a series of intramuscular injections over a period of about 24 hours and using not more than 100,000 units; the discharge ceases "like turning off a tap," and the usual tests for freedom from infection become and remain negative. It is obvious that under present conditions penicillin should not be used

<sup>1</sup> *Lancet*, 1941, 2, 177.

<sup>2</sup> *J. Amer. med. Ass.*, 1943, 122, 1217.

<sup>3</sup> *British Medical Journal*, 1943, 2, 755.

wholesale for this purpose; indeed, it is probable that even when the supply position has much improved penicillin should be reserved for sulphonamide-resistant cases. There are so many other unsatisfied demands for the drug that may be held to have a superior claim for reasons which include the actual saving of life, that even this limited concession may occasion misgiving until supplies are adequate for all purposes. It is now announced that penicillin can also be used for the treatment of syphilis. Preliminary studies of the treatment of the disease in rabbits having given encouraging results, the investigation has now been extended in the U.S.A. to man, and Mahoney, Arnold, and Harris<sup>4</sup> report on the effects in four cases. These were all men with chances of eight to ten days' standing. They had no treatment except intramuscular injections of penicillin, each dose containing 25,000 units, given 4-hourly day and night for 8 days, the total dose thus being 1,200,000 units. Some malaise and slight fever were produced, and the chancre became painful and the inguinal lymph nodes enlarged and tender. Dark-ground microscopy was employed at 4-hourly intervals from the start of treatment to study the effect on the organism: no *T. pallidum* could be found after sixteen hours. No fewer than seven qualitative and three quantitative serological tests were used to follow the progress of the disease, and, with a few doubtful exceptions in one case, all became negative, usually some weeks after the treatment was complete. It is of course intended to watch these cases further, and very prolonged observation of a much greater number will have to be carried out before the treatment with penicillin even of primary syphilis can be accepted as efficient. On possible actions at later stages there is no information at all. It will, of course, be of immense advantage if a course of only eight days even of very arduous treatment should prove to be effective, and it will certainly be safer than any other form of intensive treatment, since penicillin has never been known to have any serious toxic action. Who would have supposed that both venereal diseases would ever be curable by the use of a single remedy?

### DIGITALIS IN CONGESTIVE HEART FAILURE

Although the use of digitalis for the treatment of heart disease was due to Withering, one of our own countrymen, it has been left to those elsewhere to make the fullest use of it, for even to-day digitalis and the digitalis glycosides, such as digoxin, are scarcely ever given to patients with heart failure when the rhythm is normal. As a result of the work of Mackenzie and of Lewis digitalis is reserved for the heart failure which follows auricular fibrillation, a failure due not to any weakness of heart muscle but to a disordered rhythm. Like any other pump, the left ventricle cannot eject fluid unless there is time for it to fill between each stroke. If the impulses come from the auricle too quickly, as when the auricle fibrillates, the output from the ventricle is poor, no matter how powerful the ventricular muscle may be. Digitalis and its glycosides restore the normal output by depressing conduction from the auricle to the ventricle and so reducing the number of impulses which reach the ventricle. The ventricular rate is slowed, and the ventricle has time to fill. Digitalis, however, has another action: it increases the force of contraction of the cardiac muscle. When this action is demonstrated on a normal heart muscle it is small and not impressive; in muscle which is damaged, however, it is much greater. It should be the duty of every teacher of pharmacology to show his students how strophanthin increases the cardiac output in a heart-lung preparation in which the ventricular muscle has first been weakened by

a barbiturate. This demonstration is important, because it is the basis of the use of digitalis in patients with failure in whom the rhythm is normal.

Recently S. Berséus,<sup>1</sup> working in Stockholm, has determined the effect of glycosides of strophanthus and of digitalis on the cardiac output of normal individuals and of patients with congestive failure. In conformity with results in animals he observed very little effect on the cardiac output of the normal subjects, but in the patients he was able to demonstrate the increased output with certainty. He used a Danish preparation of digitalis called digiton, injecting 2 c.cm. intravenously. This is equivalent to 2.6 c.cm. (or 40 minims) of standardized tincture of digitalis. In one group of patients the mean of the initial values for the cardiac output was 1.97 litres per minute. One hour after injection this rose by 19%; after two hours it was still 15%, and after two and a half hours 8%, above the initial value. A similar result was achieved in one patient in whom there was no disorder of rhythm and who had a slow heart rate. This was a case of mitral stenosis and insufficiency, with pronounced decompensation and a heart rate of 52 per minute after fourteen days without digitalis. When the injection was given the cardiac output rose from 2.32 litres per minute to 2.59 after two hours. The patient improved considerably with digitalis and diuretics. In these patients there was not only a rise in the cardiac output but also a fall in the arteriovenous oxygen difference; with the improved circulation the venous blood arriving at the right side of the heart was not so reduced. The decrease in the arteriovenous oxygen difference was 15% at its maximum. These results bring to memory the efforts of the late A. Fraenkel to popularize the use of strophanthin<sup>2</sup> for patients with heart weakness and normal rhythm. Strophanthin, which in the *B.P.*, 1932 is a standardized preparation of uniform potency, is given intravenously, and has a similar action to digitalis, but it is not cumulative, so that the injection can be repeated every other day. Fraenkel used 1/240 grain (or 0.25 mg.). One of his more remarkable charts<sup>3</sup> showed the loss of 15 lb. oedema fluid in a patient to whom he gave strophanthin, despite the existence of arteriosclerosis, a heart rate of 40 per minute, and complete heart-block.

It is probable that there are many patients who after an attack of pneumonia or bronchitis continue to suffer from congestion at the base of the lungs for some time. A careful trial of digitalis in the form of leaf or tincture, or as the crystalline glycoside digoxin, should certainly lead to more rapid disappearance of the congestion. Berséus also made observations on the effect of theophylline diethanolamine on the cardiac output and of nikethamide (coramine) and leptazol (metrazol or cardiazol). None of these substances affected the cardiac output of patients with congestive heart failure, and the only substance which produced any effect at all was theophylline, which in a dose of 0.2 g. given intravenously caused a slight increase in the oxygen consumption. It is excellent to have clinical evidence from patients with heart failure that these substances do not act as cardiac stimulants.

Dr. H. Guy Dain, Chairman of Council of the British Medical Association, will receive the honorary degree of M.D. from the University of Birmingham at a special congregation in July next.

Dr. R. W. Craig, Scottish Secretary of the B.M.A., is one of the newly elected Fellows of the Royal Society of Edinburgh.

<sup>1</sup> *Acta med. scand.*, 1943, Suppl. 145.

<sup>2</sup> *Strophanthin-therapie*, Julius Springer, Berlin, 1933.

<sup>3</sup> *Lancet*, 1935, 2, 1101.

<sup>4</sup> *Amer. J. publ. Hlth.*, 1943, 33, 1387.

## TEACHING AND RESEARCH IN OPHTHALMOLOGY

BY

Sir JOHN HERBERT PARSONS, D.Sc., F.R.S., F.R.C.S.

Recent discussions and correspondence reveal some confusion of thought among ophthalmologists with regard to the rôles of teaching and research. This confusion seems to permeate the discussions and planning of medical education in general. It may therefore be worth while to analyse the concrete example of ophthalmology. Before doing so, however, certain general principles of medical education should be stated and be firmly kept in mind. The primary functions of the medical man are the alleviation and prevention of bodily ailments; and, important though research may be, it is not derogatory to it to assert that, so far as the practice of medicine is concerned, it is ancillary and secondary to those great primary functions. Of course, medical research may be carried on as a branch of pure science, but too great stress upon this aspect is not free from danger in dealing with medicine as an applied science. As an example one may point out that physiology has tended more and more to become a pure science, relatively independent of medicine; and however beneficial to medicine this may ultimately be, it does not appear to have been immediately beneficial to the teaching of medical students.

In his excellent article on "Some Principles of Reform in Medical Education" (*B.M.J.*, 1944, 1, 173) Dr. F. M. R. Walshe, after reference to the universal dissatisfaction with the present curriculum, says: "It is the fundamental defect of our teaching that we have not given the student a firm grasp of general principles, we have not taught him to weigh evidence, to discriminate or to think logically, and we have too often failed to imbue him with that keen desire for understanding that is the essence of true education. We have been content to preoccupy him with feats of memorizing and with the acquisition of an increasing number of techniques." He summarizes the essentials of reform as follows:

"(1) A carefully thought out pruning of the amount of factual knowledge we seek to impart, ruthlessly undertaken in order that

"(2) the student may be enabled to develop a more thoughtful and critical attitude, and a deeper understanding of the causes and manifestations of disease.

"(3) An explicit recognition of the necessity of a leaven of theoretical medicine, side by side with its vocational aspects, and the provision of a category of teachers who shall develop it."

In an article on "Medical Education of the Future" (*Lancet*, 1940, 1, 420) I expressed the opinion (1) that the teaching and curriculum for the qualifying examination should be designed to produce the best type of general practitioner;

(2) that the teaching hospitals should cater for both undergraduate and postgraduate students. So far as I have been able to gather from conversations with members of the various planning organizations, the first principle has been definitely accepted, but I have been able to obtain no evidence that the extremely difficult task of initiating radical changes in the teaching and curriculum which this reform demands is being embarked upon. As Dr. Walshe remarks, "In addition to this rebuilding of the very foundations of medical education, there can be no doubt that an urgent need is a quite ruthless pruning of the range and amount of factual knowledge we expect of the student."

### The Teaching of Ophthalmology

Applying these general principles to the teaching of ophthalmology, it is immediately apparent that this specialty is essentially a postgraduate study, and that the undergraduate student should be taught only those parts which are necessary for a general practitioner—e.g., the diagnosis and treatment of external diseases, the use of the ophthalmoscope, and, last but not least, when to call in the help of an expert. This course will be best carried out in the ophthalmic department of the general hospital.

It is unnecessary to deal here with postgraduate teaching. Except to state that medical ophthalmology should receive more attention than at present and that it would be best carried out

in an eye hospital, and most efficiently in one closely related topographically and corporately with a general hospital. The regional distribution of medical teaching which seems likely to obtain in the future will facilitate such a scheme. Each region should have its ophthalmic institute incorporated with the central teaching hospital and school. Two such institutes would suffice for London: one in the north, near University College, formed by the amalgamation of Moorfields, the Central London, and the Western Ophthalmic Hospitals; the other in the south, near King's College Hospital, formed by the amalgamation of the Westminster and the South London Ophthalmic Hospitals. Other such units should be established in the large provincial towns.

### Research in Ophthalmology

When one considers research in ophthalmology it is equally necessary firmly to bear in mind certain general principles. Here again the fundamental principles have been clearly set forth by Dr. Walshe in his article on "Strategy and Tactics in Research" (*B.M.J.*, 1943, 1, 467). While it is impossible and most inexpedient to divorce so-called "basic" from "clinical" research, there is sufficient disparity between them to justify considering ophthalmic research under these headings.

*Clinical research* has long flourished in eye hospitals, and should be encouraged in every way, financial and otherwise. It should not, however, in my opinion, be under the control of a whole-time professor, except in the very rare instance of the advent of a man specially endowed by temperament, originality of thought, skill, and training (see below).

"Basic" research—the investigation of the nutrition of the eye, intraocular pressure, glaucoma, cataract, etc.—demands a knowledge and a training which few ophthalmologists possess. Such notable exceptions as Donders, Leber, Priestley Smith, and, more recently, Duke-Elder and Mrs. Dorothy Campbell, are *rarae aves*. Such research requires extensive, profound, and up-to-date knowledge of many branches of pure science—physics, chemistry, biochemistry, and so on—together with prolonged training and familiarity with laboratory techniques. These attainments are more likely to be found among young physiologists than among ophthalmologists. As Dr. Walshe so well says, "No planning can provide us with these men or determine the goal of their labours"; and again, "It is round the man and not round the plan that the wheels of research revolve most rapidly." This all-important fact was clearly recognized by Sir Walter Fletcher, and the phenomenal success of the Medical Research Council probably owes more to it than to any other. Encouragement, opportunity, financial assistance, and a free hand to a man who has shown originality, skill, perseverance, and enthusiasm in research may well eventuate in "a sort of spontaneously arising organization that has grown round a personality and has owed little or nothing to deliberate planning. When this comes into existence it is the richest of all sources of original knowledge" (Walshe).

### The Research Professorship

It is a fallacy, only too prevalent at the present time, to imagine that the lavish endowment of whole-time *ad hoc* professorships and their multiplication will solve the problem of research. It does not follow that this is not the ideal method of procedure in appropriate conditions. The most important of these are (first and foremost) the man; and then intimate association with other research workers, especially those engaged in ancillary sciences; and, of course, adequate facilities.

For reasons already stated, the most suitable man is likely to be found among the younger physiologists. Dr. Lythgoe was an outstanding example of the success of nursing up and ensuring an adequate livelihood for a young physiologist interested in visual problems. But for his untimely death he might well have founded a school of research. Even he was lacking in clinical ophthalmic experience. I thoroughly endorse the opinion of Dr. Walshe: "I cannot believe that any medical research worker can afford to divorce himself from clinical studies. When he does so he invariably loses touch with reality."

The qualities required for a "basic" research professor in ophthalmology are exacting. The Medical Research Council have been fortunate in obtaining Dr. Hallpike as head of an

otological research unit, and I have reason to think that they would be prepared to institute a similar ophthalmic unit if a suitable man could be found. If found among the physiologists it should be made a condition of his grants that he should obtain clinical experience in an ophthalmic centre. In the meantime it would be wise to devote financial support to grants in aid of clinical and basic research, and to defer the appointment of a whole-time professor until a suitable clinician or a suitable basic research worker is discovered.

Some reference should be made here to the Oxford Ophthalmological Research Endowment scheme. The conditions at Oxford fulfil most of the requirements for a whole-time professor. There is an eye hospital next door to a large general hospital. All the facilities of the University science laboratories are available, and these provide the requisite "atmosphere" of research. Moreover, the senior surgeon to the eye hospital, Miss Ida Mann, is of proved skill as a research worker. One has here the nucleus of an ophthalmic research institute which more than any other at the present time justifies support.

## Reports of Societies

### SINUS TROUBLE IN CHILDREN

At the Royal Society of Medicine on Feb. 25 a discussion was held on sinusitis in children.

Mr. H. BEDFORD RUSSELL said that failure to detect sinusitis after the infections of childhood might condemn the patient to a long train of apparently unrelated diseases. The earlier the treatment of sinusitis the greater the hope of achieving complete cure. The vicious circle of swelling, lack of ventilation, and more swelling must be broken. The indication was to reduce the swelling and introduce some harmless vasoconstrictor to every available part of the mucous membrane. Medical men were disinclined to use cocaine because of its habit-forming properties, but he had not met with addiction after its use in the nose. The risk of absorption through the mucosa was reduced by mixture with some vasoconstrictor. In children with sore noses it was important not to use the speculum unsupported. Nor was it desirable to use the spray with the patient supine; if the patient would not sit up the head should be turned to one side so as to avoid the need for tilting the spray. He demonstrated on a small patient his palliative displacement method. Though the aim of displacement was simply the introduction of fluid, its use was often immediately justified by the avoidance of a huge blob of mucus. In judging the results of displacement note should be taken of the cessation of nasal breathing and relief of headache.

Mr. S. E. BIRDSALL said that the developmental continuity of the nose, sinuses, and middle-ear led to the logical conclusion that sinusitis was likely to be just as common as otitis media in children. It was not so regarded because of three obvious corollaries in middle-ear disease which made its recognition easy and were not found in sinusitis in children—namely, pain, loss of function, and visible external disease. In adults sinusitis might exist without any appreciable formation of pus. The essential in diagnosis was anterior rhinoscopy. In 80 cases of indisputable sinusitis in children, the clinical features of which he had tabulated, the aetiology was hard to assess, and in only 13 was there good evidence of antecedent cause. Of specific infections, unless the common cold was regarded as such, whooping-cough was the most common. The important symptoms in these 80 cases were, first, nasal obstruction, and, secondly, cough. Cure of sinusitis in children depended only on recognition of the disease. Ephedrine was very often successful. Operation was necessary in fewer than 10%.

Mr. A. WELLS held that defective respiration was the root cause of a great number of cases of sinus trouble, particularly in children. The blocked nose meant increase of pathogenic organisms in the nasopharynx. Most infants breathed perfectly freely through the nose in spite of the fact that the adenoid tissue in the nasopharynx was present at birth. At some stage the child developed a cold in the head and became for the time a mouth-breather. In due course resolution took place

and the tissues returned to normal, but in a proportion the mouth-breathing continued as a habit or a necessity. He recommended the simple treatment of diastolization as being likely to prevent the need for a great deal of after-treatment. The apparatus consisted of hollow rubber bougies of various sizes, shaped to adapt to the nasal canal. By compression of a bulb the bougie dilated. Saline solution was introduced into the nose, and a massage of the nasal mucosa was brought about. Out of over 2,000 children with defective hearing severe enough to fail in the test on three consecutive occasions, 57% improved after a course of diastolization sufficiently to enable them to pass the test.

Dr. W. GUNN said that he had searched the records of fever cases at the North-Western Fever Hospital in a recent year and found sinus infection only in 8 out of just over 2,000: 5 of these 8 were associated with infectious diseases, 3 of them being measles.

Dr. R. CRUCKSHANK said that the cases of sinusitis he had seen were cases which had defeated both physician and surgeon and had come as a last resort to the bacteriologist in the hope that some vaccine might be found. He uttered a word of warning about *Staph. aureus*, which was present in the nasal cavities of from 60 to 80% of children; therefore the discovery of it in the nasal swab did not necessarily mean infection in the nose or associated sinuses. It was remarkable how frequently the patient did not refer the symptoms to the sinus. Persistent sore throat, headache, general mental weariness, and recurrent attacks of pneumonia might be associated with the primary focus in the sinus. On the bacteriological side of this problem the nasal carrier as a possible source of infection should not be forgotten. If examination was confined to throat swabs, more often than not the actual source of infection would be missed.

### A Question of Terminology

Mr. T. B. LAYTON asked what was sinusitis. What would be thought of the Section of Medicine or the Association of Physicians if they spent two solid hours talking about "rheumatics"? Yet it was something corresponding to that that Mr. Bedford Russell and Mr. Birdsall had done. They had lumped together a number of different pathological conditions under the term "sinusitis." Pus in the sinuses was, in his opinion, rare in children. When it did occur it was very difficult to eliminate. He had still under his care a girl aged 20 who developed it after either scarlet fever or measles at the age of 5. The nasal cavity was even yet not quite free from pus, but during the interval she had developed normally in mind and body, and had none of the numerous disabilities which were said to be attributable to sinusitis. Early in the 'twenties it became appreciated that instead of polypi in the nose being secondary to sinusitis, there was a polypoid reaction in the lining of the maxillary and other sinuses. Presumably that reaction was inflammatory, and one could rightly apply the term "sinusitis" to it, but when there were two distinct lesions to which the same term was applied it was well to use a qualifying adjective. Polypi were not common in children; in the rare cases in which they occurred they were secondary to a suppurative reaction in the sinuses on which the original teaching was based. The sinuses were involved in the great majority of cases of rhinitis, and he thought this rhino-sinusitis should be treated on physiological principles, the first object being to restore nose-blowing as the swelling of the mucous membrane in the acute invasive stage began to pass away. He urged that before children were discharged from a fever hospital the nurse should take care to establish nose-blowing. This would be of greater value "than all the cultures and swabs in the world."

A meeting of the Joint Tuberculosis Council was held at the London School of Hygiene and Tropical Medicine on Feb. 19, with Dr. James Watt in the chair, when among much other business the following resolution of the Tuberculosis Association was reported: "The Council of the Tuberculosis Association be instructed to approach the Councils of the J.T.C. and the N.A.P.T. with a view to a joint request to the Minister of Health to make B.C.G. available for trial in this country." In the discussion which followed Prof. W. H. Tytler expressed the view that, if an investigation was asked for, the general use of B.C.G. would be delayed for a considerable period. Though the majority of members were of the

opinion that B.C.G. should be made available for the inoculation of selected tuberculin-negative persons, no formal change was proposed in the terms of reference, and Prof. Tytler and Dr. Wilfrid Sheldon agreed to represent the Joint Tuberculosis Council in the deputation. The following officers for 1944 were elected: chairman, Dr. James Watt; vice-chairmen, Dr. P. Sutherland and Dr. N. Tattersall; hon. treasurer, Dr. A. P. Ford; hon. secretary, Dr. Norman England. The Council recorded appreciation of the very valuable services rendered by the retiring officers: Dr. J. B. McDougall as hon. secretary, and Dr. G. Jessel as hon. treasurer.

At a meeting of the Manchester Medical Society on March 1 Dr. A. A. Moncrieff gave an address on "Some Disorders of the Newborn Baby." He indicated first the importance of the subject, since the death rate among the newborn had not been reduced and represented a loss of life which was serious. Organized effort in other parts of the world, notably Chicago, had effected a great reduction. Much of the trouble arose from the way in which people regarded diseases of the newborn as rather mysterious. Just as paediatrics was general medicine at a special age period so diseases of the newborn were largely problems of applied physiology and pathology at the beginning of life. Dr. Moncrieff dealt first with problems of respiration, showing how the work of Adrian and of Barcroft had cleared up many problems. Respiratory failure was most commonly due to obstruction or to depression of the respiratory centre. Next he dealt with head injuries in the newborn, pointing out how their management was the same as in adult patients, and he stressed the value of hypertonic saline per rectum. Finally he dealt with some of the problems of infection in the newborn baby, stressing the need for research into many aspects of immunity at this age period. In reply to a question he gave a brief survey of the influence of the Rh factor on the mother and foetus.

## Correspondence

### Reform in Medical Education

SIR.—In his admirable paper on this subject (Feb. 5, p. 173) Dr. F. M. R. Walshe discusses the peculiar situation which has resulted from the rise and spread of specialization in medicine. Medical education, it would appear, is in danger of becoming a mere vocational training. The student spends years in amassing numerous facts relating to the various special branches of medicine, yet he may remain unable to weave these tangled threads into one coherent fabric of knowledge.

This problem has been recognized in high places, and one plan for its solution, now under trial by military and civilian authorities alike, has been the introduction of the psychologist into the scheme. Apparently it is felt that, although by this action the services of yet another specialist are enlisted, the psychologist, encountering the patient who, for better or worse, has passed already through the hands of experts in other departments of medicine, will focus attention upon the man himself rather than upon his individual organs. As for the present, any tendency on his part towards an incoherent or disconnected conception of medicine may be counteracted, it is hoped, by the wider vision revealed to him by a study of psychology, normal and abnormal.

Unfortunately, this solution of the difficulty is not fulfilling all the hopes of its promoters. As Dr. Walshe remarks, psychological medicine is still "highly charged with controversial matter." He goes on to suggest as the essentials of reform in medical training, first, a careful pruning of the curriculum; and, secondly, the introduction of what he terms "a leaven of theoretical medicine." A closer attention to the theory or the first principles of medicine would presumably supply to the student some of that philosophical outlook which Claude Bernard sought to impart to readers of his classic work *The Introduction to the Study of Experimental Medicine*. Some such fundamental "grounding" must strongly appeal to those who view with alarm the ever-rising tide of specialism. But where is this basis of medical theory to be found? Probably not in psychological medicine, nor, indeed, in any medicine of to-day, so sadly decimated and fragmented by the specialists. Not to the present but to the past we must look—to that past so often derided as useless and obsolete—if we wish to study first principles in their correct perspective.

In his recent address to the Royal College of Physicians Churchill, confessing himself to be a great admirer of

tradition, remarked that, "*The longer you can look back the further you can look forward.*" His words might well be adopted as a slogan by those responsible for medical education. There is much to be said for a "return to Hippocrates," warmly advocated a few years ago by those who saw danger in the present-day trend of medicine. They hoped that the entire patient, and not merely a small part of him, would occupy once more the centre of the picture. There might even be justification for the reinstatement of the "Aphorisms" as a students' textbook. But medicine has had a long and varied career since the "Father of the Art" held his clinics under the plane-tree of Cos, and nothing less than a complete conspectus of medical thought and practice throughout the centuries will furnish that theoretical foundation which modern medicine so sadly lacks. Sir William Osler was of opinion that "by the historical method alone can many problems of medicine be approached profitably." Nevertheless, at the present time none of the medical schools of our country is providing systematic instruction in the history of medicine for its students. "It is a dry age," continues Osler, "when the great men of the past are held in light esteem." Have we arrived at that "dry age" so far as medicine is concerned? If we have, the remedy is obvious.—I am, etc.,

Edinburgh.

DOUGLAS GUTHRIE.

### Prevalence of Ketosis among Children

SIR.—For some time it has been apparent that an increased number of children have been seen in this area with the signs and symptoms of faulty fat metabolism. As shown by routine testing of children's urine for acetone bodies (Rothera's test) a large proportion are suffering from some degree of ketosis.

It is well recognized that acute infections may be accompanied by acetone bodies in the urine, and that in certain types of children nervous or physical exhaustion (over-excitement or violent exercise) may have the same effect, as may vomiting from any other cause. It seems, however, that at the present time the majority of children examined have acetone bodies in the urine.

The commonest symptoms and signs are anorexia, headache, hollow-eyed appearance, bad breath, pyrexia, abdominal pain, and vomiting. The vomiting may be absent, slight, or repeated. The pyrexia may be as high as 104° F. without any sign of infection, and the abdominal pain severe enough to suggest the possibility of acute appendicitis. In differential diagnosis it is necessary to exclude diabetes, organic disease of the brain and kidneys, and appendicitis. As regards treatment, the alteration of the diet to low-fat high-carbohydrate, and the regular administration of glucose, together with an alkaline mixture or "alkazanc," have a beneficial effect in nearly all cases. The following are cases illustrating different types.

M. H., aged 6, for two years had had sudden pyrexial attacks, often unaccompanied by vomiting, though this had occurred on one or two occasions. Urine in all attacks gave a strongly positive reaction when tested for acetone bodies. Skimmed milk, reduction of fat, and regular glucose diminished but did not entirely remove these attacks. Finally no milk was allowed at all, and "alkazanc" was given. So long as this regime was followed he remained free from attacks, but on the introduction of even a small amount of milk they recurred.

P. M., aged 3, had been "off colour" for several months with a poor appetite and general debility and loss of weight. Alteration of diet produced rapid and lasting improvement.

R. T., aged 12, was a new child to the district (urgent evening call to suspected appendicitis). The history was that the family had moved that day and the boy had taken an active part in helping to arrange furniture in the new house. He was highly intelligent and was said to have been very excited by the move. He complained of severe abdominal pain, had vomited several times, and his temperature was 99.8° F. There was no localized tenderness and the urine gave a strongly positive reaction for acetone bodies. Next day no symptoms—out for a walk.

The chief contributing factor seems to be the natural tendency on the part of mothers to fill up children with a poor appetite with milk and such other dairy products as are obtainable. The rationing of sugar and the diminished sweet consumption also probably play a part in predisposing to ketosis.—I am, etc.,

F. B. P. EVANS.

Tewkesbury.



### Nervous Breakdown in the Navy

SIR.—I have read with great interest Surg. Lieut.-Cmdr. G. Tooth's article on nervous breakdown in the Navy (March 11, p. 358) and his interesting discussion of the significance of domestic difficulties. His tables appear to show one point which he has not emphasized—namely, that the bad prognosis of those cases where domestic difficulties were found to be the main cause is explained by the proportion of such cases in which this factor was one of multiple causes: the proportion inviolated where domestic difficulties alone was the main cause (24.4%) appears to be intermediate between that for enemy action (29%) and that for conditions of service (22.6%). It would perhaps be surprising to find in wartime that domestic difficulties were a more important cause than enemy action or conditions of service (out of a total of 284 cases in Table I there were 58 with domestic difficulties as a main factor). Such considerations, however, do not alter his conclusions concerning the need for social services, since "domestic difficulties" is presumably the only one of the three factors he has studied which can be tackled.—I am, etc.,

Birmingham.

RUSSELL FRASER.

### Vaginal Ulceration and Vitamin C Deficiency

SIR.—*Odium albicans* and *Trichomonas vaginalis* were examined for as part of the routine investigation of all cases of vaginitis attending the gynaecological clinics referred to in the article on vaginal ulceration and vitamin C deficiency which appeared under our joint names in the *Journal* of Feb. 19 (p. 254). Both conditions were excluded in the cases quoted in this article, but this was not expressly stated, as in neither case was the vaginal discharge characteristic of an infection with *Odium albicans* and *Trichomonas vaginalis*.

We agree with F. B. Chisholm (March 4, p. 338) that where *Odium albicans* and *Trichomonas vaginalis* are not responsive to their specific treatment it may well be that vitamin C deficiency may be the underlying cause. This can be supported by cases we have seen, where secondary infections of syphilitic ulceration and gonococcal vaginitis have cleared rapidly with large doses of ascorbic acid.—We are, etc.,

M. K. LAWLOR.

M. F. RICHARDSON.

Radcliffe Infirmary, Oxford.

### Gold Treatment of Chronic Arthritis

SIR.—May I congratulate you on your excellent and very timely leading article on gold treatment (March 4, p. 329). Your endeavour to clarify the issue must be deeply appreciated by anyone who, like myself, day by day observes on a very large number of patients how widespread—I would even say indiscriminate—has become the use lately of this not so indifferent drug. I have seen not only many cases of typical osteoarthritis but even a case of chronic lumbago that had been subjected to this treatment. Having been among the first—if not the very first—to employ gold (Möllgard's original sanocrysin) for the treatment of various types of arthritis nearly 20 years ago, I discovered that this drug has a very limited usefulness, and in a certain type of rheumatoid arthritis only.

Some years ago in a booklet (*Der Gegenwärtige Stand der Rheumafrage*, originally an anniversary lecture to the Czechoslovak Medical Association at Bratislava and published by that association in 1937) I said:

"As to the gold injections so generally used lately, after thorough serial experiments carried out on several hundreds of patients I came to the conclusion that their use should be restricted to those cases which are undoubtedly of infectious origin, the infection still being more or less active and the virulence being clearly shown by small, if even minimum, rises of the body temperature. In such cases it will be always possible to break the acute tendency of the disease and bring about an improvement of the defensive power of the organism, thus preparing the soil for the successful employment of other healing principles. Although by a very careful application of the injections it is nearly always possible to avoid any serious damage to the organism, yet such damage can and does occur, and I would like to utter a serious warning against the stereotyped use of these injections."

May I add to this that the cases of rheumatoid arthritis referred to belong to a definite type. In your *Journal* on March 24, 1928, I described the exact nature of this type of

articular rheumatism. The therapeutic suggestions made there have undiminished validity even if gold treatment is carried out simultaneously.

In order to achieve a higher concentration of the gold in the synovial fluid without increasing the total amount incorporated into the system of the patient, I am at present trying to introduce electrically dissociated gold ions direct into the various joints with the help of iontophoresis. My experiments are far from complete yet, but so far they seem to be promising. I hope to be able to publish the final results later on. Meanwhile much useless suffering and unnecessary expense to patients and serious disillusion to doctors could be avoided if doctors would take your well-founded warning to heart and would seriously scrutinize their cases before submitting them to this treatment.—I am, etc.,

Newark.

L. SCHMIDT, M.D. Prague.

SIR.—May I, with all due deference, refer to one or two points in your recent editorial on the treatment of chronic arthritis by gold. The profession has, I believe, come to regard such articles as valuable reviews upon different subjects compounded by authoritative specialists. Hence I feel that some comment upon this article on the treatment by gold should be made, in order that a truly fair and comprehensive review may be achieved.

In the first place there is no mention of an exactly similar investigation published eight years ago by Koppenhofer, who came to almost identical conclusions as those in the article to which you have referred by Freyburg, Block, and Levy. He does, however, make an additional and interesting observation that the situation in which the gold is deposited changes most significantly—in that in the normal animal gold is deposited in the parenchymatous cells of the liver, while whenever there is infection present in the body then the gold is deposited in the reticulo-endothelial system, and he cites similar differential deposition in the cells of the lung with and without the presence of tuberculous infection. Koppenhofer further pointed out that gold aurothiosulphate salts are broken down within the body to the sulphide, which (as I have always understood it) was the reason for using gold sulphide *ab initio* as a therapeutic substance.

Your article does, however, reach the essential point in one phrase: "... since it is still unknown where, how, and why gold salts work." This is the crux of the whole matter. There is surely a good deal of evidence that the action of gold is necessarily upon the functions of the liver and reticulo-endothelial system. Koppenhofer subscribes to the view also held by Feldt that the action of gold "is of importance in the biological stimulation of the natural defences of the organism... as an activator of the proteolytic ferments accelerating the disintegration of toxic substances." This would seem contrary to your editorial statement that the only possible action of gold is to lessen or arrest inflammation, though it is not stated just how. Personally, from clinical pathological experience I have always considered gold, especially when deposited in the metallic form, as having many possibilities as a biological catalyst. From the clinical point of view there is no doubt that some physiological action can be attributed to intramuscular injections of colloidal gold sulphide, and if it may be expected that the action is a catalytic one in the reticulo-endothelial system there would seem to be no reason to doubt that the usual chemical laws in relation to catalysts would not be operative.

I suggest that it would only be a fair judgment to acknowledge that clinical therapeutic effects are noted in this country as a result of the injection of gold sulphide, and also to acknowledge or recognize the earlier work of the late Koppenhofer with such very similar results. I feel certain that your suggestion that rheumatoid arthritis is "an active inflammatory condition" is a red herring which it is probably wisest not to drag any further at this juncture, nor, indeed, the question whether thiomalic acid is an inorganic compound.—I am, etc.,

London, W.1.

HARRY COKE.

SIR.—In a leading article of March 4 on the treatment of chronic arthritis with gold you speak of the conspicuous lack of carefully controlled observation in the treatment of rheumatoid arthritis by gold until the recent research by Freyburg,

Bloek, and Levy and the work of Sabin (*Proceedings of the Mayo Clinic*, 1942). Your attention should perhaps be drawn to some significant British work, published in 1937 and 1938, by Hartfall, Garland, and Goldie (*Lancet*, 1937), and by Ellman and Lawrence from the Rheumatic Unit at St. Stephen's Hospital, L.C.C. ("Gold Therapy in Rheumatoid Arthritis, with Controlled Experiments"), and by Gasking from Harrogate, these two papers appearing in the *Reports on the Chronic Rheumatic Diseases*, Vol. 4, 1938, to which full reference is made in recent American works on "chronic arthritis." It is regrettable indeed that the White Paper makes no special mention of the rheumatic diseases.—I am, etc.,

Great Bookham, Surrey.

RICHARD A. MANCLARK.

### Familial Anaphylactic Death

SIR.—In your issue of March 4 (p. 331) you use the adjective "familial" preceding the word "allergy," and I must say I like it, though "familial anaphylaxis" would be better. Nothing separates these sudden deaths in persons sensitive to the protein injected from the experimental anaphylaxis of the guinea-pig except this peculiar tendency to a family history of the same or other allergic complaints.

In 1,000 consecutive cases of familial allergy a history was obtainable in 567 cases of asthma or similar complaint. In 1,000 non-allergic cases there was a family history in 422. So that asthma as a whole bears this familial trait almost as much as the allergic side of it.

Happily I have not seen such a fatality myself, probably from the small doses used and the amount of adrenaline given with them, but there are plenty in the literature. Samson quotes 40 deaths from horse-serum content in antisera. He reckons that 1 to 70,000 children may be expected to die in this rapid anaphylactic manner if it is given without the fullest precautions. The nearest approach I ever had was when giving to a very severe case of asthma in a young woman four minims of a 5% solution of peptone intravenously. Her respirations at once became more and more difficult, she became blue in the face, speechless, and then unconscious, her chest being in an inspiratory spasm. She passed water—a typical anaphylactic symptom. Ten minims of adrenaline intravenously gradually brought her round, her pulse rate being little affected during the shock. Perfectly well next morning she went to work and was free from asthma for five weeks.

Deaths have occurred from intradermal test injections, so that the puncture test or scratch tests are preferable, and always so with pollen. Using a control this is an easy way to avoid these sudden deaths, if one were at all nervous about any particular case—that is, its degree of sensitivity. I am sorry there was no greater attempt made to find out how it was that the girl mentioned in your annotation became sensitive to guinea-pig serum, nor does the original American paper help us.—I am, etc.,

London, W.1.

FRANK COKE.

### Chloroform Anaesthesia

SIR.—Dr. W. H. Spoor (March 11, p. 374) has not been able to adduce a more cogent argument in defence of the use of chloroform than did John Snow, who, believing ether to be safer, justified his use of chloroform on the grounds that "an occasional risk never stands in the way of ready applicability." His implication that "the expert" has abandoned the "rag and bottle" in favour of the offspring of an oil refinery and a B.B.C. transmitter merely to satisfy an unreasoning urge to play with lovely toys is misleading. Many anaesthetists of consultant standing are quite as expert chloroformists as any G.P., however old, and have to their credit as many administrations without a fatality. Why, then, have they virtually discarded an agent possessing so many advantages?

I only know my own reason, which was that the continued failure of the Angel of Death to appear had little or nothing to do with my skill but a lot to do with my luck, and that the latter might not hold out indefinitely. Or, to use the words of the A.M.A.: "The use of chloroform for major operations is no longer justifiable. Scientific investigation and clinical experience agree that necrosis of the liver (chloroform poisoning) follows in a by no means negligible number of cases. The causation of this sequel

is unknown. There are, therefore, no precautions that intelligently be taken against it. For minor operations use of chloroform should cease, since its place can be taken by nitrous oxide and other agents. A previous condition suffering or anxiety or a prolongation of the stage of excitement renders a subject liable to collapse with a small dose. Risks of this sort are far greater with chloroform than with ether and greater with ether than with nitrous oxide. As they cannot be foreseen they cannot be avoided, except by replacing a dangerous anaesthetic by a safe one."

It is more accurate to say that chloroform *does* rather than *can* damage the liver, nor does ether *per se* cause pneumonia: the examples cited illustrate the abuse, not the use, of ether. When the contents of the G.P.'s waistcoat pocket are deemed inadequate to cope with some anaesthetic problem in a private house or nursing home, the expert does not find the transport of his apparatus an insuperable difficulty.—I am, etc.,

Aylesbury.

LOFTUS DALE.

### Trilene

SIR.—As manufacturers of trilene, I.C. (Pharmaceutical Ltd.) has been concerned about reports of toxic manifestation following the use of trilene as a general anaesthetic in a closed circuit with soda lime. Consequently upon suggestions made to us by Dr. H. E. Cox, Dr. Langton Hewer, and Dr. J. B. Firt that trilene underwent decomposition in the closed circuit with soda lime, we initiated investigations to determine this point. The results of these investigations were to have been the subject of a paper by us, but in view of the papers published in the *Journal* of March 4 by (1) Dr. J. H. Humphrey and Dr. Margaret McClelland and (2) Dr. S. Carden, our intended publication is not called for, as our investigations confirm the fact that dichloroacetylene is liable to be formed when trilene is used in a closed circuit with soda lime. A warning notice to this effect is now printed on all trilene packages, etc.—I am, etc.,

C. M. SCOTT,

I.C. (Pharmaceuticals) Ltd., Manchester. Director of Medical Research.

### Eye Signs of Anaesthesia

SIR.—Books on anaesthesia discuss the various signs of anaesthesia, but give comparatively small space to the eye signs which, in my opinion, are as valuable as other phenomena to assist in determining the plane of clinical anaesthesia. The late Mr. Herbert Charles of the Middlesex Hospital taught his anaesthetic clerks certain eye signs which are not generally known, at least by the younger postgraduate.

In consciousness the emmetropic subject, looking straight ahead into the distance, is seen to have the pupils "central and parallel." The pupil is midway between the palpebral fissure, and the rays of light are parallel on entering each pupil. This position of the eyes occurs at the beginning of inhalation anaesthesia, although the pupillary diameter may be altered according to the premedication. The size of the pupils need not be discussed here, as this is dealt with in all textbooks on the subject.

At the end of the first stage (Guedel's classification) the eyes, still parallel, begin to rotate downwards, and still more so during the second stage. This state is well seen in nitrous oxide, vinyl ether, and ethyl chloride inhalations. Towards the end of the second stage the eyes, still parallel, deviate to one side or the other. Occasionally coarse oscillations are noticed, but are too inconstant to be of any clinical value. The next well-marked phenomena occur in the first plane of the third stage. Here the eyes become markedly divergent, with the pupils usually above the middle line. This position is complete at the end of the first plane, with the pupils becoming centralized. As the depth of anaesthesia increases the angle of divergence becomes lessened, until the pupils are once again central and parallel. From here the position occurring in the early third stage remains unaltered, however much the depth is increased. As the stages of anaesthesia are reversed, so are the eye signs.

It will be seen, therefore, that these ocular movements form an accurate guide to the depth of anaesthesia.—I am, etc.,

London, W.3.

E. V. SLAUGHTER.

### Benzene Poisoning

SIR.—I have read the article by Drs. Hamilton-Paterson and Browning (March 11, p. 349). The writers seem to think there is no very satisfactory clinical method of detecting early cases. During the last war and for some years afterwards I examined large numbers of men. Early cases of poisoning were readily

detected by the one definite sign—viz., bleeding from the gums. I pointed this out in an article which I contributed to one of the medical journals at the time. Some of these men died, and at the necropsy haemorrhages into various organs were found. I am therefore of opinion that haemorrhage of any kind is always to be regarded as a danger signal in persons exposed to the risks of benzene poisoning.—I am, etc.

Edinburgh.

JAMES BURNIE

### Culturing Meningococci

SIR.—The article on meningococcal jaundice by Dr. C. Crawford (March 4, p. 325) interested me very much, and I wonder how the blood cultures were done. Two years ago, while I was resident in the City Hospital, Little Bromwich, Birmingham, we had two cases of suspected meningococcal septicaemia, and on the suggestion of Dr. Kerr I inoculated a blood agar plate, which was previously warmed in the incubator to 37° C., with a few drops of blood directly from the syringe, and in both cases we grew pure cultures of meningococci in 24 hours. Incidentally, neither of these two cases developed meningeal symptoms.

I think it would be worth while to try this method, as it seems to give very quick results.—I am, etc.,

Isleworth

E. LEIBOWICZ.

### Exomphalos

SIR.—I have read with interest the recent correspondence on this subject, and would wish to endorse the remarks of Prof. Lambert Rogers and Mr. Leonard Leys on the advisability of early operation for complete exomphalos. During 1943 three cases of exomphalos came under my care—two partial and one complete. The first infant, operated on within 5 hours of birth, had caecum, ascending colon, and ileum in the sac. Reduction of the contents was comparatively easy, recovery was uneventful, and six months later the child was thriving. The second child was admitted 72 hours after birth, the sac ruptured and infection was present. It contained the caecum, appendix, and lower ileum, and a vessel running from the mesentery to the apex of the sac had to be ligated. This infant also made a completely uneventful recovery and was fit and well when seen two months later. The third case was one of complete exomphalos and the child was operated on within three hours of birth. The sac contained the liver, stomach, and spleen as well as the caecum, ascending colon, and small intestine. Following Prof. Rogers's advice, I found that reduction of the liver was simplified by reducing the intestines first. This infant survived operation and lived for six months, only to succumb to an attack of acute gastro-enteritis. Where the liver is absolutely irreducible it may be partially exteriorized by suturing it to the wound edges.

Judging from the few cases published it seems well worth while attempting a radical cure by operation in all cases of exomphalos. The results in the partial variety are always likely to be good, but statistics indicate that operation should by no means be deferred in the complete type. To be successful the operation must be done within six hours of birth, and without operation the mortality is 100%.—I am, etc.,

Burnley.

E. W. THOMAS.

### Health Journal for the Layman

SIR.—I am not in agreement with Dr. J. Parness (Feb. 19, p. 270). The hypochondriacal magazines of the pseudo-scientific press will always flourish like the proverbial bay tree because they reflect a distinct (though pathological) attitude of mind. Apart from providing an income of sorts to the hack journalist, they afford an outlet for the morbid imagery of those who make a cult of ill-health. Like the platforms in Hyde Park or the letters of mental patients they serve a useful purpose in allowing an escape from repression. The healthy-minded public are, I believe, already sufficiently catered for. There is the "Radio Doctor." Most of the daily and Sunday newspapers feature occasional health and psychological articles, which are, on the whole, fairly sound and sensible, written by sufficiently well qualified doctors with a flair for the popular appeal. The women's journals and magazines usually have a medical journalist (perhaps not so well qualified) on their outdoor staff. Many of the weeklies

and monthlies present brightly written health articles on topics of current interest.

Responsible editors of to-day are, for the most part, too intelligent and well informed to allow quasi- or pseudo-scientific journalism any rope. If this adequate health diet is to be supplemented at all there are interesting possibilities in the future of films and television. I feel sure that a "popular" health magazine on sensible lines would fall between two stools: neither the neurotics nor the healthy-minded people would subscribe, at any rate for long. Indeed, if they did, they might soon become neurotic. Those who dwell upon their own health tend to become ill, or imagine they are, which is very much the same thing. Broadly speaking, the less an individual thinks of the "workings" of his own body and of his "feelings," the better he is. Now, I would like to know how the ordinarily suggestible person can subscribe to some presumably thoughtful health magazine, diligently reading through it, without giving some thought to the contents and their application to himself.

A quick perusal of an article in a newspaper, a brief instructive talk over the wireless (which you can turn on and off as you like), a film on some aspect of preventive medicine—these may be all right; but when you start bringing attractively dished-up health to the study or bedside for uncritical interpretation, that is the day hypochondriasis may be born. Moreover, a suitable editor for such a magazine will not be found growing on every gooseberry bush. Presumably he would need to be some well-qualified medical-man-cum-journalist with a mission. Not the least use that lay journalist with health interests; not the least use some medical grammarian inspired by academic textbooks; not the least use some exclusive body of experts who read this and review that, and who have to consult one another before making a move! With all due respect to certain eminent medical periodicals, that is not the sort of thing we want. And what about the contributors? From where are they to be drawn?—I am, etc.,

Exminster.

JOHN W. FISHER.

### Sulphaguanidine in Treatment of Flexner Dysentery

SIR.—Dr. H. G. Smith (Feb. 26, p. 287) has reported on toxic skin manifestations in almost 50% of his 44 cases treated with sulphaguanidine. His observations have struck me, inasmuch as Capt. A. E. Brewer (*Journal*, Jan. 9, 1943, p. 36) saw toxic symptoms in only 4% of his 51 chronic and in none of his 26 acute cases, although his dosage was in a number of cases not less than 142 g. given by Dr. Smith.

I do not wish to discuss the possible reasons for this discrepancy, but I should like to state that I saw no toxic skin manifestations among 26 cases of Flexner Z last autumn. The reason for it is, I think, that I gave not more than 12, 10, 6, 6, 6 g., or, in other words, about 40 g. were sufficient in all cases, except the one that relapsed, for the complete disappearance of the clinical symptoms and for six successive bacteriological negative findings. In this connexion I may state that I gave 150 mg. ascorbic acid a day from the onset until the clinical symptoms permitted minced vegetables, mashed potatoes, milk, etc., to be given.—I am, etc.,

Prestwich.

PAUL L. WEILL, M.D. (Tuebingen).

### Doctor and Patient

SIR.—In spite of adverse criticism Dr. Barlow's, of course, quite right; and those who, from some Olympian eminence, write editorial homilies directed at their colleagues in general practice should first try and get some first-hand experience of the intense frustration which conscientious doctors have been experiencing during the war years. This will not be acquired by doing a holiday locum for some general practitioner, but will need four years of wartime conditions. One detects the crack of a whip from higher up in this annotation, and in your editorial of some months ago where you castigated G.P.s for issuing certificates without examination, as if (as others have pointed out since) symptoms were not often more conclusive than physical signs.

It is this lack of *esprit de corps* and allegiance to one's own in all ranks of medical men and women which has always made the thoughtful doctor despair of his own profession.

With the best will in the world, how can a doctor with a 95% contract practice consistently refuse to give a certificate for, say, lumbago (that first and last refuge of a scoundrel), when he knows very well that someone else will if he doesn't? And is not this perpetual kicking against the pricks of the honest doctor the best argument for a State-controlled medical service, where his masters may be counted on the fingers of one hand, instead of being directly proportional to the number on his panel list?

One knows that the war effort is paramount, and that nothing should stand in its way, but it will be a bad day when the general practitioner loses his humanitarianism.

After all, even in wartime, one's patients are not all malingerers, and medical science, boast as it may, cannot measure that indefinable weariness, both mental and physical, which many are now experiencing.—I am, etc.,

HOVE.

G. L. DAVIES.

SIR.—It is a relief to know that the truth about the vexed question of what is wrong (as distinct from right) has, under divine providence, been declared to Dr. Frederic Sanders (March 4, p. 341). I had not pictured myself or my neighbours as rooting after the "nimble shilling" like a hog after acorns. But which of us knows himself?

However, I would not have further trespassed on your space and patience if I were not convinced that beyond the realm of abuse there is here an issue of major consequence. The doctor-patient relationship depends on mutual confidence. The obligation to avoid absenteeism is primarily the patient's. Most patients meet their obligations. With the absentee we are discussing default upon this obligation. Here the problem begins with the diagnosis of default. Since subjective evidence from the patient is a large part of many diagnoses in routine work, are we to say that the doctor shall accept it when he gives a certificate and reject it when he refuses one?

Even if a doctor were able to judge default with accuracy is it necessarily effective to drive a reluctant and resentful patient back to his work? Since in practice the refusal of certificates in the interests of the war effort commonly implies the herding back of the debilitated with the defaulter, is not the end in view likely to be defeated by the measures taken?

• There is now so much pressure on the doctor to make a moral or a social judgment where the situation demands a diagnostic or a therapeutic judgment that in my view it is dangerous for the practitioner to allow outside considerations to influence his obligations to his patient. This is particularly true at present when the State, with new duties and new coercions, hovers darkly on the medical horizon. Now more than ever I would say the purist's attitude is right. The doctor's obligation is to his patient and to him only. The only rider I would add is that which justifies the public control of infection. I am, etc.,

OXFORD

K. E. BARLOW.

### Tonsillectomy in Children

SIR.—In the recent correspondence in the *Journal* on this subject too much importance has, I feel, been given to the removal of the faucial tonsils, with the consequent overshadowing of what is, in my opinion, by far the more important part of the combined operation—that is, the efficient removal of adenoids.

Undoubtedly, recurring attacks of sore throat and cervical adenitis are the symptoms for which the majority of such patients are referred to the laryngologist, while such symptoms as transient attacks of earache, deafness, and nasal catarrh are only too frequently waived aside or treated lightly, since on examination of the throat the faucial tonsils appear healthy. While admitting that in most cases of adenoids there is usually evidence of tonsillar hypertrophy, this is not invariably so, and herein lies the reason why so many of these cases are missed. I would stress this point, for such aural symptoms are of the utmost importance as being the precursors of recurrent attacks of otitis media, and the direct cause in many cases of chronic middle-ear disease with its attendant distress. In all such cases, therefore, an examination of the nasopharynx should be undertaken, and in the vast majority adenoids are found to be present.

Mr. Layton makes an important point when he says that the physiological function of the palate and fauces is frequently disturbed by the fibrosis consequent upon the removal of the faucial tonsils, and I submit that, in a large number of cases, as much benefit is to be obtained by the efficient use of the adenoid curette by itself as by subjecting the patient to the more fashionable operation of combined removal of both adenoids and tonsils.—I am, etc.,

Dartford.

MORTON G. MARKS.

### Consultant and Specialist Services

SIR.—May I, on behalf of my fellow specialists, be permitted to thank Mr. Hamilton Bailey for his courageous letter of Feb. 19 (p. 270). While admitting the great experience that membership of the staff of a teaching hospital confers, may I direct attention to the necessarily small number of teaching hospitals throughout the country? Is it, perhaps, suggested that all of us engaged in specialized practice and not on the staff of a teaching hospital should, by some manoeuvre, be admitted to the "charmed circle"? Perhaps something like Hitler's "honorary Aryans" is intended? If so: it would be in keeping with the "oyster-like" secrecy of the "Herrenvolk."

If a register we must have, why not let us all know why, where, when, and how. Perhaps one of those in the know can enlighten us.—I am, etc.,

London, W.I.

DAVID HALER.

## Obituary

H. G. TURNEY, D.M., F.R.C.P., F.R.C.S.

We regret to announce the death on Feb. 26 at his house in Park Square West, London, N.W., of Dr. Horace George Turney, O.B.E., consulting physician to St. Thomas's Hospital.

Born in 1861, he began his medical education at Trinity College, Oxford, and continued it in London at St. Thomas's Hospital, taking his first medical degrees in 1888. Having held house appointments at St. Thomas's he proceeded to the M.Ch. degree at Oxford in 1890 and to the D.M. in 1897, by which time he had taken the M.R.C.P. diploma and also the F.R.C.S. He was elected F.R.C.P. in 1898. It was while holding the post of resident assistant physician at St. Thomas's that his bent for clinical medicine showed itself unmistakably: in due course he was promoted to the honorary staff, and after many years of faithful service to the hospital and its medical school he retired and was elected consulting physician. At the Royal College of Physicians he served on the Council in 1915-17 and as Censor in the years 1921, 1922, and 1924. He examined for the English Conjoint Board in 1916-20, and had been external examiner in medicine for the University of Liverpool. He was also at one time medical referee to the Treasury. For his services during the last war, with the rank of captain, R.A.M.C.(T.), he was awarded the O.B.E. (Military) in December, 1919.

Dr. Turney's interest in disease of the nervous system, while practising as a general physician, was recognized by his election as president of the Neurological Section of the Royal Society of Medicine and by the invitation given him to contribute the article on the trophoneuroses for *Allbutt's System of Medicine*. One of his sons, Dr. Horace Ferguson Turney, has practised for some years in London.

We are indebted to Sir FARQUHAR BUZZARD for the following appreciation:

My memory of H. G. Turney, who has died recently at the age of 83, goes back 50 years to the time when I became a student at St. Thomas's Hospital and found him and H. P. Hawkins the two youngest physicians on the teaching staff. From that day to this one has thought of him almost always in that connexion for the reason that he devoted the greater part of his life and energies to the hospital and never took a very prominent part in outside professional activities. True, he was for three years a Censor of the Royal College of Physicians and held the presidency of the Neurological Section of the Royal Society of Medicine, but he was not a very regular attendant at the meetings of medical societies.

made no great contributions to medical literature, and was little known to the general public as a consultant. He belonged in fact to a group of teaching consultants in the large medical schools of London whose chief interests lay in their hospital duties and responsibilities. And in this direction his services—to patients, students, and nurses—were invaluable and warmly appreciated. Turney collected many diplomas in his younger days, both medical and surgical, and was unusually well equipped as a general physician with a strong leaning towards neurology. His mind was that of a scholar rather than of a craftsman; widely read and with a remarkably retentive memory, he had a profound knowledge of medical literature. Unlike that of his colleague Seymour Sharkey, whose successful coaching for examination purposes was very popular among the students, Turney's teaching was best appreciated by a select few who could always rely on him for good advice in regard to their reading and scientific studies. To be his house-physician was an experience of real educational value, as he never spared himself in giving help and encouragement both to his younger colleagues and to his patients.

A retiring, unselfish, generous, and learned physician, whom many generations of St. Thomas's men will look back upon with gratitude, admiration, and affection.

#### SIR HENRY MAUDSLEY, K.C.M.G., M.D., F.R.C.P.

News has reached this country from Australia of the death on March 5 in the Royal Melbourne Hospital of Sir Henry Carr Maudsley, consulting physician to that hospital and to St. Vincent's Hospital, and formerly lecturer on medicine and clinical medicine in the University of Melbourne.

Born in Yorkshire on April 25, 1859, the eldest son of Thomas Maudsley of Stainforth, Settle, he was educated at University College, London, graduated M.B., B.S.Lond. in 1881, and obtained the M.D. two years later after serving as resident medical officer at University College Hospital. He took the M.R.C.P. in 1884 and was elected F.R.C.P. in 1901. Making his home in Melbourne he was for some years physician and pathologist to the Alfred Hospital, and also physician to St. Vincent's Hospital. For his services during the last war he was mentioned in despatches, created C.M.G. in 1916, and three years later K.C.M.G. and C.B.E. Sir Henry Maudsley joined the British Medical Association in 1907, and at the Annual Meeting in Melbourne in September, 1935, he held office as vice-president of the Section of Neurology and Psychological Medicine.

Dr. J. E. M. WIGLEY writes: As an old student of Sir Henry Maudsley's, of whose recent death I have just read, I would like to take this opportunity of paying a tribute to his memory. His ward rounds at the Melbourne Hospital have left a lasting impression of his sound, kindly, and sympathetic dealing with his patients, while his teaching was always essentially clinical, laying great stress on the funds of knowledge which could be obtained from careful observation. The outbreak of the last war prevented my applying for the position of his house-physician, a post always much sought after. He will always remain in my memory as a fine example of the term applied to a great leader of medicine—"a beloved physician."

#### G. L. EASTES, M.B., B.Sc.

George Leslie Eastes, who died at Gerrards Cross on March 4 after a long illness, was born in London on Dec. 16, 1870. The second son of George Eastes, M.B., F.R.C.S., who for many years practised in Gloucester Terrace, he was educated at Marlborough, proceeding to London University and Guy's Hospital. He took his B.Sc. with honours in physiology in 1892 and qualified M.R.C.S., L.R.C.P. in 1894, obtaining the M.B., in which he won honours in medicine and forensic medicine, in 1895. After holding the post of house-surgeon at the Sheffield Royal Hospital he became interested in clinical pathology, which was his life's work, and was appointed director of the Clinical Research Association. In 1901 he founded the Laboratories of Pathology and Public Health, which he converted into a private company in 1938 with the object of assisting medical charities, holding the position of chairman until failing health compelled him to abandon all professional activities. His interests tended more towards the public health than the clinical branches of pathology, and

he was the author of several publications on bacteriological subjects. During the last war he served in the R.A.M.C. in the Middle East and held the rank of captain, being mentioned in despatches. Dr. Eastes joined the B.M.A. in 1895, and was secretary of the Section of Pathology at the Annual Meeting held that year, and vice-president in 1933. He leaves a brother and sister.

H. S. W. writes: Clinical pathology loses in G. L. Eastes a man who perhaps did more than any other to make the medical profession "pathology minded." After a short period as director of the Clinical Research Association and pathologist to Great Ormond Street Hospital he founded the Laboratories of Pathology and Public Health, bringing to the medical profession a pathological service previously unobtainable. His work was characterized by the most careful attention to detail, which, with his great experience, caused his opinion to be widely sought. As a colleague he was ready to advise and assist his juniors in any difficulties that arose in the course of their work, and his advice was invariably sound. Although of late years he had ceased to take an active part in the working of the laboratory, he was always keenly interested in its work. His hobby was archaeology, and he wrote a monograph on Saxon remains in English churches.

We regret to announce that Dr. JAMES ORR, director of the James Mackenzie Institute for Clinical Research, died at St. Andrews on March 9. Born in 1876 at Hawick he was a son of the late Prof. James Orr, D.D., of Edinburgh, and was educated at Watson's College and Edinburgh University, graduating M.B., Ch.B. in 1899. He was for some years resident medical officer to the City Parochial Hospital, Craiglockhart, after a house-surgeoncy at the Dundee Royal Infirmary. During the last war he served in Egypt with a temporary commission in the R.A.M.C. Dr. Orr was author with Sir James Mackenzie of the well-known book *Principles of Diagnosis and Treatment of Heart Affections*, which went into a third edition in 1926, and his long connexion with the James Mackenzie Institute began when he joined the staff as physician. He obtained the M.R.C.P.Ed. in 1927 and was president of the Fife Branch of the B.M.A. in 1931-2.

Dr. ERNEST J. PEILL, who has died in Edinburgh as the result of a motor accident, was a remarkable man. He did outstanding work in China as a medical missionary for 27 years. Born in Madagascar the son of a missionary, he and his two brothers, Arthur and Sidney Peill, graduated in medicine at Edinburgh University. They all three gave themselves to missionary work in North China. Later he came home and took the F.R.C.S.Ed., devoting himself chiefly to surgical work. In 1901 he was appointed by the London Missionary Society to the charge of the Siao Chang Hospital, to which he gave much distinguished service. In 1911 he went to Peking on appointment as professor of surgery in Peking Union Medical College—the precursor of the present Rockefeller College, where he raised the tuition of surgery to a high standard. During the last war Dr. Peill volunteered for service with the Chinese Labour Corps, as he had a fluent knowledge of the language, and was sent to the Chinese General Hospital (2,400 beds) at Noyelles in France. There he was appointed officer-in-charge of the surgical division, and in this capacity did splendid work. He retired from China in 1928, and was made medical superintendent of Quarrier's Homes at Bridge of Weir, where he successfully specialized in the surgical treatment of tuberculosis. He was, however, unable to continue in this work because of ill-health. During the present war he became a leading member of medical recruiting boards in Edinburgh. He had a calm and sympathetic temperament that made him greatly beloved by all with whom he came in contact, especially the Chinese, among whom he spent the best years of his life, and to whom his courteous, philosophic, and courageous character greatly appealed. Though of a retiring nature, he had a great many friends, and was much respected and loved by all who knew him.—G. D. G.

Dr. ALASTAIR MACGREGOR, well known for his work on physiotherapy, died in London on March 13. He was born at Inverness on Sept. 1, 1864, son of the Rev. Alex MacGregor, M.A., and was educated at Inverness Academy, Edinburgh Academy, and Edinburgh University, graduating M.B., C.M. in 1885 and proceeding M.D. in 1905. Coming to London he became casualty officer and clinical assistant in the electrical department of the West London Hospital and afterwards served for 17 years as chief assistant in the electrical department of St. Bartholomew's Hospital. On the outbreak of the last war he joined a medical formation attached to the 10th French Army and later served in the electrical department of the British Red Cross Hospital at Netley, and at the King George Hospital and the Paddington Military Hospital. He was later appointed



never been consulted in the framing of this scheme. A body called the Representative Committee of the medical profession had met the Minister of Health in March, 1943, and were told what had been decided. In July, 1943, the chairman of one of the larger committees of the B.M.A. authorized a statement that negotiations must be based on acceptance of a Cabinet decision that a single unified health service covering all the population would be instituted, and that local administration would be under local authorities responsible to a Minister. At a meeting in London the Minister informed the Representative Committee that it was proposed to secure control of the medical profession "in order to keep a firm hand on the issue of certificates." The proposals in the White Paper followed the decision of the Cabinet as announced. It would be impossible to work a scheme if those operating it intensely resented the conditions imposed on them.

Dr. SUMMERSKILL intervened to say that Sir Ernest represented the views of a small section of the profession. Dr. RUSSELL THOMAS: "Of the vast majority."

Sir ERNEST said that less than 10% of those who would be asked to work this scheme favoured it. The total on the *Medical Register* was 70,000, of whom 50,000 were in practice. About half the general practitioners were serving in this country and half abroad. Of doctors questioned in cities and large areas of this country 90 to 95% were against proposals involving lay control of the profession. The Representative Body of the B.M.A. at a meeting in September, 1943, rejected, by 200 to 10, the proposed reduction of the profession to a salaried medical service. A more recent questionnaire sent to 30,000 practitioners in active practice in this country resulted in 70% opposition to lay control by a central authority. Dr. MORGAN said the questionnaire dealt not with policy or principles but with details of the scheme.

Continuing, Sir ERNEST said the B.M.A. proposed to consult its members who were serving overseas. It would be difficult for any serving officer to answer its questions with due consideration. The Health Centre had attractive features, but was it possible for there to be a free choice of doctors after the institution of the Health Centre? The prospect of a number of specialists in connexion with these centres was illusory. The prospect of any worth-while private practice surviving was not hopeful. At present, under Defence Regulations, doctors were forbidden to transfer their services. Was that type of direction going to be perpetuated? In recent years, by development of contributory schemes, the voluntary hospital system had become a widely appreciated co-operative system of medical service. The proportion of staff to patients was much larger at the voluntary hospital, the comparison being about 10% at the voluntary hospital and 1% at the public hospital. Voluntary hospitals were centres of research because consultants gave their time. Under what conditions would these consultants work if the Government scheme were adopted? General practitioners would be under the strict rule of the Central Medical Board.

#### *B.M.A.'s "Disagreement Only in Detail"*

Dr. HADEN GUEST said he did not claim to represent the medical profession and denied Sir Ernest Graham-Little's claim to represent any large part of it. Sir Ernest did not represent the views of the B.M.A. Most medical persons would agree there could be as free choice of doctors in a Health Centre as there was elsewhere. The White Paper was a reasonable basis for discussion. He hoped the Government would let the House know whether private practices which were set up in the future would be saleable or not. The period during which that commercial element in practice should continue should be as limited as possible. Ultimately every doctor, nursing service, and hospital should be a combination of service to the State with the retention of voluntary initiative in certain ways. If the voluntary hospitals stood out from the scheme their influence would dwindle. He was convinced that the leaders of the London teaching hospitals would throw their authority into a unified hospital system. The B.M.A. only disagreed with the White Paper in matters of detail.

Mr. CRAIK HENDERSON thought there should have been longer after the publication of the White Paper for the views of the medical profession, the voluntary hospitals, and the public to be ascertained. It was unjust to ask the voluntary hospitals to come under a joint authority where all the power would be given to the body owning the alternative form of hospital service. Voluntary hospitals should have the right to nominate their own representatives to the Central Health Services Council. A central hospital advisory committee containing representatives of the voluntary and State hospitals should be set up to consult with the Minister. A local joint hospital committee for each area should also contain representatives of voluntary and State hospitals. If necessary there could be a neutral chairman. Legislation should lay down the sum to be paid by local authorities in respect of the number of beds in voluntary

hospitals. There should be a Hospitals Grants Committee analogous to the University Grants Committee.

Mr. ALEXANDER WALKDEN, speaking on behalf of the Labour Party and the T.U.C., said he had been asked to congratulate Mr. Willink on the White Paper, which would be the basis of a Government Bill. The new plan would be specially welcomed by the women of the country. Young doctors and medical students whom he had seen welcomed the idea of full employment in Health Centres.

Dr. HOWITT welcomed the White Paper and said the great majority of the medical profession would do so. It showed the contributory scheme was dead, but the voluntary hospitals were not going to be shut. When replies were received in July to the medical questionnaire they would show that the vast majority of the medical profession did not want a great increase in the salaried services. To run this National Health Service satisfactorily there must be a 50% increase of doctors, but the White Paper as it stood would not attract the best people into the profession. The Minister must make the profession attractive and leave ample scope for initiative, hard work, and independence.

Dr. MORGAN declared that the White Paper was a step in the right direction, but it did not propose a comprehensive national health service. The stress was on the medical side at every stage; public health and social medicine had been left out. Not a word was put down about a preventive policy in industrial medicine. When doctors looked at existing medical services they had grounds for their misgivings about bureaucrats. The Colonial Medical Service was one of the worst in the world.

Mr. STOREY said it was hard to refrain from the conclusion that those who framed the White Paper proposals shaped the scheme so that the voluntary hospitals could continue in business only if prepared to provide a service at less than cost, so that, at no distant date, it would be possible to acquire at scrap prices the voluntary hospitals, their buildings and equipment, and to build them into a State service. Sir JOHN GRAHAM KERR said the prospect of mounting step by step in a safe, organized profession would be less attractive to brilliant young men than the present system in the medical profession. Mr. DOUGLAS remarked that nothing in the White Paper was actively directed to dealing with the cases of disorder which were not recognized as illness and laid the foundations of permanent disease.

The debate was adjourned.

#### *Debate Renewed*

Miss HORSBRUGH on March 17 reopened the debate. She said Dr. Howitt had referred to the supply of doctors. The Government had looked into that. There was at present about one doctor to 2,000 of population, but these doctors were not evenly distributed. There were far too few consultants and specialists. Wartime admissions to the medical schools had been at the rate of 2,300 a year. The Minister would be responsible for the Central Medical Board, and he was also responsible to Parliament. There had never been any policy of direction for doctors. The doctor could set up a private practice wherever he liked. There was no control of private practice. He could, if accepted, do full-time public service. He could do part-time public and part-time private practice. But if there were a shortage of doctors in an area to which a young doctor wanted to go to do part-time public and part-time private practice he might be told that he must do full-time public practice there, but that there were many other opportunities in the country and he could choose one of them. Members had asked if there were to be no Health Centres where there were beds. The Government wanted experiments with different types of Health Centres.

A great deal of the previous discussion had turned on hospitals. The Emergency Medical Service had enabled the Government to bring the hospitals, both municipal and voluntary, into a common service, with interhospital transport, and specialists at the different hospitals. Each hospital had kept its identity. Similarly the Government wished to bring all the hospitals of the country into the new scheme. Parliament was now making the contributory scheme for voluntary hospitals a universal and compulsory one. She could not agree that the money should be paid to an individual hospital, but she believed that gifts from grateful patients would continue. The hospitals, if they wished, could still have paying beds. She believed that the Government was helping the voluntary hospital to continue as an independent unit. The Government must have further discussions on how payment should be made to the voluntary hospitals, and might include a pooling scheme. There would be Government inspection of both municipal and voluntary hospitals to see a proper standard was maintained. All types of hospitals would contract to do particular work, for which they would receive payment in addition to flat-rate payment. The hospital could accept or refuse the contract. If there were

not enough beds in an area the joint board must supply them, if necessary by a new hospital. She thought the hospitals would be pleased to come into the plan. She believed that young men and women would have far greater opportunities in medicine. They would not be hampered by patients' inability to pay. Schemes of research, training, and teaching would give the best opportunities.

Mr. GREENWOOD said a bigger personnel would be required in the profession and provision for medical teaching must be extended. Existing teaching hospitals would be inadequate. He would like to see more prominence given to mental treatment. The medical profession existed for the public good, and doctors could not be the final factor in determining the future of the scheme. Nor could the voluntary hospitals. The Labour Party accepted the scheme as a substantial instalment in a public health service. Mr. MESSER said it would be better for the general practitioner who did not want to come into the scheme to keep out of it. He would not refuse that practitioner the right of following up his patients who came into hospital.

#### *End of Private Practice*

Sir HENRY MORRIS-JONES said he would have preferred the scheme to be confined to those who needed it. If the scheme succeeded there would be a practical abolition of private practice. If private practice still flourished five years after the introduction of the scheme that would mean that the scheme was a failure. Dr. SUMMERSKILL called the scheme a coalition compromise. It was planned to cure disease rather than to prevent it. The scheme would accentuate social distinctions in the treatment of disease. When they gave the doctor a salary they got the best out of him. To allow publicly paid doctors to take fees was a kind of thing not allowed in the Department of Whitehall and should not be allowed in the medical profession. The Government hoped to starve the voluntary hospitals into submission, but the process might take a long time. Scottish members continued the debate. Major LLOYD asked what would be the position of the mental hospitals in Scotland of a voluntary character, seven of which had Royal Charters. Their beds were about a quarter of all the sick-beds in Scotland. Were they to be taken into full partnership by the joint boards or the regional councils?

Mr. TOM JOHNSTON, winding up the debate, said the proposals had been agreed to by all sections of the Government. The Government proposed no compulsion on doctors to come into the public service. The new service could not be put into operation all at one time. It was proposed to discuss the whole question of payment, including options, with the medical profession. Whatever system was adopted the number of patients which a doctor could undertake must be limited. But if the doctor stayed out he could take any number of patients. He thought the selling of practices a degrading system. It would be discussed with the profession. There was no question of stopping all private practice.

Of voluntary hospitals, one-quarter were run in a pre-war year with a deficit. Flag days for hospitals were not a commendable way for a great service to finance itself. There must be a better way. Scotland had seven large base hospitals, with about 7,000 beds, for war emergency services. These would make a great addition to the hospital service which the Government hoped to have in the near future by agreement of all concerned. Co-operation had been secured in one or two areas. In Aberdeenshire and Kincardineshire, and in Gloucestershire, there were arrangements for transfer of convalescent patients from key hospitals to other hospitals. There was no Government antagonism to voluntary hospitals. The Government invited them, as autonomous organizations, to co-operate in making the new health service a success. They appeared willing to co-operate. The voluntary hospitals in Scotland had agreed for numbers of their waiting-list patients to be treated in the State hospitals. Some 26,000 patients from the waiting lists had been thus treated.

The House then carried the resolution moved by Mr. Willink.

#### *Nutrition and Infant Mortality in Scotland*

Opening a debate on March 8 about nutrition and infant mortality, Mr. TOM JOHNSTON said the total consumption of liquid milk had risen 34% since 1939. In Scotland 67% of the whole school population received milk at school; in England and Wales 78% of the children at school. Sir John Orr had said a survey of working-class families in industrial towns in Scotland had shown that there was a definite improvement in the health value of their diets, the average intake of some of the important vitamins and minerals being over 20% higher than in the pre-war years. Over a fifth of the children attending school were given a midday nutritious meal in Scotland. In England the figure was 29%. Vegetable consumption had remarkably increased. In Glasgow in 1943 boys entering

school life were 0.40 in. taller and 1½ lb. heavier than boys who entered school life in the pre-war quinquennium. Girls increased 0.28 in. in height and nearly 1 lb. in weight. Tuberculosis, however, increased because of deterioration in the housing conditions and not nutrition.

Infant mortality in Scotland was decreasing. Last year it was 65 per 1,000 births, the lowest in the annals, but maintained a ratio 30 to 40% higher than in England. The report from the Scientific Advisory Committee on this subject had aroused widespread interest. Despite criticism that it was unduly weighted in favour of nutritional aspects of the problem, it was a report of great competence. Bad housing, while a high contributory factor to infant mortality, was by no means the sole one. He would like to draw the attention of local authorities in Scotland to the fact that in January of this year the intake of welfare foods for mothers and children was still lower than the corresponding figures for England and Wales 7% worse in cod-liver oil, 20% worse in vitamin A and D tablets, and 18% worse in the intake of orange juice. That matter should be corrected by the medical officers of health concerned.

#### *Deaths from Infections: Special Inquiry*

Scotland had more maternity hospital beds to births than England, and more births in institutions. During the war also the number of hospital beds in Scotland had increased by 50% to 2,260. In Glasgow 55% of births were in hospitals and nursing homes (40% in 1938), in Edinburgh between 60 and 70%, in Dundee 77%, in Aberdeen 75%. Increased use was being made of ante-natal clinics. In Glasgow last year about 77% of expectant mothers attended ante-natal clinics. About one-quarter of the total deaths in the first month of babyhood were due to infections. In a consecutive series of 25 post-mortem examinations of children dying during the first month in the Maternity Pavilion, Edinburgh Royal Infirmary, 27% of the deaths were judged to be due to infection. At one time there were similar outbreaks in English and American hospitals. He was inviting the Scientific Advisory Committee to pursue as a matter of urgency an inquiry into this aspect of the problem.

Mr. Johnston then summarized what his Department was doing upon the conclusions of the Orr report as follows: (1) They were asking for a detailed examination of why 25% of the deaths of newly born babies are caused by infections. (2) They were taking every step to prepare the way for a vast increase in sanitary and healthy housing accommodation. (3) The local authorities were doing their utmost to increase the intake of certain vitamin products by mothers and babies, to increase the number of qualified health visitors and house-helpers and the quality and use of the clinic services and the number of maternity beds. (4) The Central Council for Health Education would assist in every way possible to inculcate the advantages of high standards of personal hygiene and conduct.

Mr. BUCHANAN said the Government should proceed with housing now. Glasgow had a population of 1,000,000, half of whom had no baths and one-third of whom shared lavatory accommodation with other families. The reforms recommended by Mr. Johnston were not big enough. Mrs. TATE said the general level of well-being of the people was not high. They lost their teeth at an early age. A vast proportion were tired and listless, pallid, and not in an adequate physical condition. In view of the housing conditions she marvelled that women had courage to try to cook. Fresh milk was often not drunk because of the lack of any place in which it could be stored without going bad. Why were large supplies of the few drugs available given to the vested interests which produced quack medicines? Did anyone test these medicines to see what the contents actually were?

#### *Estimated "Hard Core" of Infant Deaths*

Dr. RUSSELL THOMAS recalled the infant mortality figures for England, Wales, and Scotland. Those for Scotland were only exceeded in Europe by countries like Spain, Portugal, and Hungary. Bronchitis and bronchopneumonia accounted for the large number of deaths in children under 1 year and were frequently associated with other infectious diseases. To control this death rate mothers must be educated in the care of infants. Parliament must see that the nutrition of mothers before and after the birth of the child was maintained on a high level. If they could proceed with these health measures and with housing, the infant mortality from infection would be reduced to a very low level. He thought infant deaths from this cause could be reduced to 12 per 1,000. They would have to leave the figure of 6.1 per 1,000 as a hard core of congenital malformation. Infant deaths from congenital debility had been reduced in England and Wales from 15 per 1,000 in 1906-10 to 2.1 in 1937-40. In Scotland the figure had not gone down in the same way, and was 7.6 in 1937-40. It should be possible to reduce it to the English level. There had been an increase in mortality

due to injuries at birth: in Scotland the increase was from 1.3 to 3 and in England from 1 to 2.5. The ordinary confinement was now normally attended by the district nurse, and the doctor was only called to the difficult ones. If he lost the experience which he would get from simple confinements a lack of skill might possibly be developing in the practitioners of the country. Dr. Thomas put the hard core of infantile mortality from inevitable accidents at birth to about 2. In death resulting from premature birth there had been little improvement from 1906 to 1940. He suggested that 14.4 was the figure beyond which we could not go in saving life in premature birth until knowledge had increased. Over the whole field he suggested that 36.5 per 1,000 should be the hard core of deaths in the first year of life in England and Wales, comparing with the New Zealand figure of 32.7. The difference in these figures was accounted for by the greater amount of respiratory disease in this country.

Dr. EDITH SUMMERSKILL contended that all other types of mortality apart from cases of congenital malformation could be traced to poverty, bad housing, under-nourishment, and other such conditions. Few surveys had been made on the physical condition of the expectant mother, but when one was made of families divided into five groups by incomes the report was that only the highest groups approached the necessary standard in protein and iron and only the highest in calcium. The supply of vitamins A, B, and C was inadequate except in the highest group. The position became progressively worse towards the lowest income group. If this kind of thing was allowed to exist women would not be able to resist tuberculosis. Some infection was the cause of death in 25% of cases of infant mortality, and practically all the children were bottle-fed.

Major MARKHAM pointed out that two months ago Lord Woolton, in a speech to the Parliamentary Science Committee, gave that committee to understand that the national diet had been so reorganized that it was completely free of vitamin deficiency, and, in addition, other elements such as calcium and iron had been added to the daily diet. Immediately after that speech the Boyd Orr report was published, based on pre-war facts and figures, and had banged the old nutrition drum. What the House would have welcomed in the report was an up-to-date analysis of the causes of infant mortality. For that report to close the evidence at Sept. 3, 1939, was a crime against the mothers of Scotland and England. He regretted that no reference had been made to climate or to the control of temperature indoors, which caused a rise in infant mortality of 52 to 100% every winter.

Miss HORSBROUGH, replying to the debate, said the Ministry agreed that housing conditions in England and Wales, and above all in Scotland, were appalling and had got worse during the war. There was no labour and material for the building programme while the war was being fought. All that could be done was to see that after the war there was not the delay there was after 1918. Credit should be given to those who in these war years had worked hard—the health visitors, the nurses, etc. It was hardly fair to say the services were bad. The Government wished to see them better, but could be proud of the work that had been done. It was remarkable that in the last year in England 96.5% of the mothers who gave birth to children were visited in their homes within a week. Beds maternity homes and hospitals had been increased by 3,000.

1 England and Wales had in institutions accommodation for at least 50% of the mothers of the country. Mr. Johnston had given alarming figures on infection in hospital. To have a maternity home or hospital in any way overcrowded when there was not sufficient isolation or insufficient staff to make isolation good was more dangerous than to have children born at home. A draft circular was going out to local authorities on provisions which could be made in wartime to make premature births as normal and the death rate as low as possible. In this, hospitals were doing wonderful work, but what was needed was to see how prematurity could be prevented. Where attack had to be made was on the mortality during the first month after birth. In one place where neonatal mortality was high the Ministry was arranging an inquiry into the nutritional standard. Such inquiries had been made in many parts of the country and many hundreds of expectant mothers had been examined, but as yet the Ministry had found that the nutritional standard was not bad. It was disappointing that only 50% of the mothers and babies in England to whom fruit juice was available took it; only 25% took the cod-liver oil, and only 39% the vitamin tablets. The Advisory Committee of the Ministry had dealt with the subject of the premature baby and rickets, and a report on rickets would shortly be published by the British Paediatric Association. The investigation of rickets was reassuring, for it was one of the diseases which had been thought likely to increase in wartime.

## Universities and Colleges

### UNIVERSITY OF EDINBURGH

It is announced that Prof. P. S. Lelean, C.B., C.M.G., F.R.C.S., will retire at the end of this year from the Bruce and John Usher Chair of Public Health in the University of Edinburgh, which he has held since 1926. During his tenure of the professorship he has greatly widened the scope of the teaching in public health, introducing instruction in child welfare, hygiene at different periods of life, and the various social conditions that have a bearing on the health of the community; he has also increased the co-operation of the Medical Officer of Health for the city and his staff in connexion with the public health course. Prof. Lelean served, as a regular officer of the R.A.M.C., in the South African War, in India, and throughout the war of 1914-18. During his period of office as professor of hygiene in the Royal Army Medical College at Millbank he trained many officers, both regular and temporary, in military hygiene. He retired from the Corps in 1922 with the rank of brevet colonel.

### UNIVERSITY OF BIRMINGHAM

A course of six lectures on industrial medicine for industrial medical officers and others will be held at the Medical School, Hospitals Centre, Birmingham, 15, on the undermentioned dates; the lectures will take place at 4 p.m. in the Physiology Lecture Theatre: April 5 and 6, "Tuberculosis in Industry," by Dr. Halfiday Sutherland. April 12, "The Education of Doctors for Industry," and April 13, "The Prevention of Disease in Industry," by Dr. Donald Hunter; April 19 and 20, "Factory Hygiene: Assessment of Standards and Methods of Investigation," by Dr. Donald Stewart. The fee for the course is £1 1s., which is payable in advance to the Secretary of the University, Edmund Street, Birmingham. Nurses engaged in industry are invited to join the course at a fee of 5s.

### UNIVERSITY OF SHEFFIELD

A legacy of £1,000 bequeathed under the will of the late Emeritus Professor R. J. Pye-Smith, who held the chair of surgery in the university until his retirement in 1910, has now been received by the University of Sheffield.

The following candidates have been approved at the examination indicated:

M.B., Ch.B.—Parts II and III: JE. S. Machell, E. S. L. Allott, G. D. Banks, Margaret A. M. Howard, Helen N. Mellanby, N. A. Vincent.

<sup>1</sup> With second-class honours.

### UNIVERSITY OF DUBLIN

#### SCHOOL OF PHYSIC

The following candidates have been approved at the examination indicated:

M.B., B.Ch., B.A.O.—D. H. Draper, C. J. Dugdale, C. W. C. McCreery, M. W. Strench-O'Carroll, R. M. C. Tyner, I. H. R. Woodrow.

## The Services

Capt. (Acting Major) J. P. Fletcher, R.C.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

The Shahinshah of Iran has conferred the Order of the Crown on the following officers in recognition of distinguished services in the cause of the Allies: Lieut.-Col. (temp. Col.) D. W. E. Burridge, R.A.M.C. (4th Class); Lieut.-Cols. E. S. S. Lucas and R. K. Tandon, I.M.S. (5th Class).

### CASUALTIES IN THE MEDICAL SERVICES

*Previously reported missing at sea, now presumed killed in action.*  
—Major R. A. Foucar, R.A.M.C.

*Reported missing, believed killed.*—Surg. Lieut. F. M. McRae, R.N.V.R.

*Died.*—Surg. Cmdr. A. W. Cocking, R.N.

### DEATHS IN THE SERVICES

Wing Cmdr. RICHARD STANLEY TOPHAM, who died suddenly on March 10, was born in July, 1890, and studied medicine at Leeds University. He qualified M.B., Ch.B. in 1915 and was commissioned in the R.A.M.C. in May, 1916. He served with the Army until 1918, when he was appointed to the Medical Branch of the Royal Air Force. He obtained the D.P.H.Camb. in 1920 and the D.M.R.E. in 1925. He was placed on the retired list at his own request in 1927, and held important radiological appointments at Chester. On the outbreak of the present war he returned to duty with the R.A.F., and early in 1940 was appointed senior medical officer with charge of the hospital at a large R.A.F. station in England.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 4

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland

Figures of Births and Deaths, and of Deaths recorded under each infectious disease for: (a) The 126 great towns in England and Wales (including London) (b) London (administrative county). (c) The 16 principal towns in Scotland (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	53	8	19	5	4	91	6	39	4	5
Deaths .. ..	—	1	—	—	—	—	1	—	—	—
Diphtheria .. ..	681	35	176	110	25	827	46	215	103	32
Deaths .. ..	13	1	1	3	—	15	—	4	1	1
Dysentery .. ..	218	33	82	—	—	68	12	38	1	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	1	—	1	1	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	35	9	3	—	70	7	1	—
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	56	6	9	15	2	48	8	4	14	2
Measles .. ..	1,987	279	218	425	1	19,200	1,421	477	11	45
Deaths .. ..	2	—	1	6	—	22	3	—	—	1
Ophthalmia neonatorum .. ..	69	6	20	—	—	103	4	25	—	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	4	13(B)	—	—	—	7	—	—	1	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	983	63	16	12	10	1,450	72	26	14	9
Deaths (from influenza) .. ..	50	3	4	3	2	79	8	8	—	2
Pneumonia, primary .. ..	—	—	282	24	11	—	411	19	12	15
Deaths .. ..	—	50	—	—	—	—	—	—	—	—
Polio-encephalitis, acute .. ..	4	—	—	—	—	2	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	6	—	—	—	—	4	1	1	2	—
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	2	9	—	1	—	6	17	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	154	6	14	1	3	179	14	16	3	1
Deaths .. ..	—	—	—	—	—	—	1	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,997	118	223	25	77	1,928	148	268	49	50
Deaths .. ..	2	—	—	—	—	1	—	—	—	—
Smallpox .. ..	8	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	3	—	—	5	3	2	—	4	20	3
Deaths .. ..	1	—	—	—	—	2	1	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,914	187	103	49	11	1,876	197	176	38	19
Deaths .. ..	13	4	1	1	1	9	2	2	3	—
Deaths (0-1 year) .. ..	—	—	—	—	—	—	—	—	—	—
Infant mortality rate (per 1,000 live births) .. ..	470	73	70	54	28	412	42	69	47	34
Deaths (excluding stillbirths) .. ..	5,962	1,153	645	278	175	4,948	773	609	232	148
Annual death rate (per 1,000 persons living) .. ..	—	—	14.8	18.1	†	—	—	13.7	15.3	†
Live births .. ..	7,277	894	865	485	258	6,489	793	851	445	250
Annual rate per 1,000 persons living .. ..	—	—	17.6	31.7	†	—	—	17.4	29.3	†
Stillbirths .. ..	244	33	38	—	—	215	14	25	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	42	—	—	—	—	29	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales during the week there were rises in the notifications of measles by 191, acute pneumonia by 125, whooping-cough by 104, and scarlet fever by 49; cerebrospinal fever was down by 22 cases and dysentery by 16.

Whooping-cough was more prevalent in the south, Suffolk notifying 43 more cases than last week, Sussex 36, and London 23; the only drop of any size was in Yorks West Riding, where 30 fewer cases were reported. The increase in measles was due mainly to local outbreaks in a few areas. The counties with the largest increases were Lancashire with 119 more cases, mainly in the urban districts; Gloucestershire with 68 more (Stroud R.D. 54, East Dean R.D. 16); Northumberland with 66 more (Newcastle-upon-Tyne C.B. 32, Gosforth U.D. 37). A fall of 61 was recorded in Kent.

Dysentery notifications exceeded 200 for the fourth consecutive week. In London there was a rise from 14 to 33. The chief of the other centres of infection were Lancashire 32, Surrey 18, Essex 17.

There have been no new cases of smallpox, the total to date numbering 11.

In Scotland there were 22 more notifications of measles and 33 of acute primary pneumonia, but there were 51 fewer cases of whooping-cough and 36 fewer of scarlet fever. The notifications of dysentery rose by 3.

In Eire the notifications of measles went up by 22: 350 of the 403 cases were reported in Dublin C.B.

## Week Ending March 11

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,215, whooping-cough 1,906, diphtheria 624, measles 2,098, acute pneumonia 1,178, cerebrospinal fever 90, dysentery 208, paratyphoid 3, smallpox 2. In the great towns there were 42 deaths from influenza.

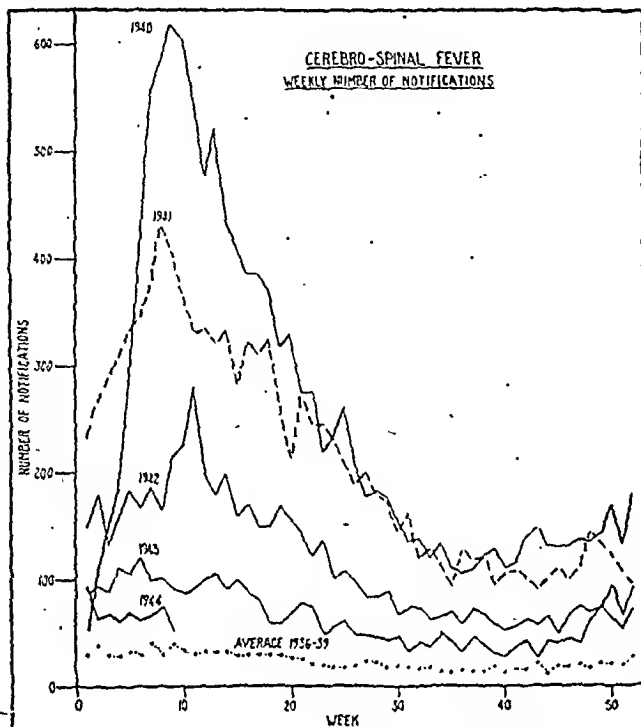
## Quarterly Returns for Scotland

The birth rate during the fourth quarter of 1943 was 17.9 per 1,000, and was the highest rate recorded in a December quarter since 1931. Infant mortality was 73 per 1,000 live births—7 above the rate for the corresponding quarter of 1942 and 1 above the average for the five preceding fourth quarters. Stillbirths were equivalent to 36 per 1,000 total births. The general death rate was 15.0, being 2.3 above the five-years average for the December quarter. This increase was mainly due to influenza, bronchitis, and pneumonia, and was greatest in the older age groups. Comparison with the five-years average showed an increase of 2% at ages 25-34, 5% at ages 35-44, 23% at ages 75-84, and 36% at ages 85 and over. 821 deaths were attributed to influenza, the largest number recorded for any fourth quarter since 1918. 57 more deaths were recorded from tuberculosis than in the fourth quarter of 1942. The death rate from all forms of tuberculosis was 75 per 100,000, and that from respiratory tuberculosis was 58. These rates were 7 and 5 above the five-years average.

The preliminary return for the year included in the report shows that the birth rate was 18.9 per 1,000, being 1.2 above the average for the five preceding years. The number of births was the largest recorded since 1928. The infant mortality was 65 per 1,000 live births—9 below the five-years average and the lowest rate ever recorded in Scotland. The stillbirth rate was 36 per 1,000 total births. Illegitimate live births formed 7.6% of all live births, the highest rate since 1929. The general death rate was 13.3 per 1,000—0.2 below the five-years average. Deaths from epidemic diseases numbered 1,947, and were 889 more than in 1942. The increased incidence was due to influenza, which rose from 308 to 1,155, and whooping-cough, which increased from 92 to 305. Decreases were recorded for cerebrospinal fever 180 to 127, scarlet fever 24 to 22, diphtheria 290 to 231, measles 144 to 88. The deaths from diphtheria and scarlet fever were the lowest numbers ever recorded. The maternal mortality rate was 3.7 per 1,000 total births—0.7 below the five-years average and the lowest rate ever recorded in Scotland. Deaths from malignant disease numbered 8,659, being 385 above the average and the largest number ever recorded. A part of this increase may be due to the ageing of the population. Deaths from respiratory diseases also showed an increase, mainly due to pneumonia and bronchitis. The death rates from these two diseases were 63 and 53, compared with 56 and 49 in the preceding year. The marriage rate, 7.6 per 1,000, was 1.9 below the rate for 1942 and is now at the pre-war level.

## Cerebrospinal Fever

The notifications of cerebrospinal fever during the pre-war years showed a seasonal rise, without a definite maximum, during the first half of the year, and the cases were approximately twice those in the second half-year. The range of the notifications was roughly 20-40 and 10-20 in the two half-years. Following the outbreak of war cerebrospinal fever reached epidemic proportions; a maximum of over 600 cases was recorded during the ninth week of 1940. Although the



incidence steadily decreased, it never fell below 5 to 6 times the pre-war level during the year. In the beginning of 1941 the cases rose rapidly to a maximum, and the trend of the disease was similar to that of the preceding year. In 1942 the notifications followed a similar curve but at a lower level. No distinct rise to a maximum occurred in 1943, and the trend of the incidence curve approximated in shape to that of peacetime but at a higher level. The decline in incidence has been continued during the present year, but it is still above twice the pre-1940 level. The course of this disease since the outbreak of war compared with the average of the four immediate preceding years is shown in the graph.

## Medical News

The new Fellows of the Royal Society elected on March 16 include Bryan Austin McSwiney, professor of physiology, St. Thomas's Hospital Medical School; Sir Jack Cecil Drummond, professor of biochemistry, University College, London, and chief scientific adviser to the Ministry of Food; Alexander Thomas Glenn, immunologist, Wellcome Physiological Research Laboratories, Beckenham; William Ogilvy Kermack, research chemist, Royal College of Physicians of Edinburgh; and Guy Frederic Marrian, professor of medical chemistry, University of Edinburgh.

At the meeting of the Medical Society for the Study of Venereal Diseases to be held to-day (Saturday, March 25) at 11, Chandos Street, Cavendish Square, W., at 2.30 p.m., Dr. Nora Wattie will open a discussion on the prevention of pre-natal syphilis. At the meeting on Saturday, April 29, the subject for discussion will be "Results of Treatment of Neurosyphilis."

The sixty-fourth annual meeting of the Mental After-Care Association will be held at Burlington House, Piccadilly, W., on Wednesday, March 29, at 2.45 p.m., under the presidency of H.R.H. Princess Arthur of Connaught. The speakers include Sir Otto Niemeyer, chairman of the Provisional National Council for Mental Health, Dr. J. Bram, of the Polish Medical Services, and Col. Henry Yellowlees, M.D., chairman of the Association. All interested are cordially invited to attend.

Prof. Arnold Sorsby will deliver lectures (1) on blindness in childhood, and (2) on the sulphonamides in ophthalmology at 4 p.m. on March 28 and 30, at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

The annual meeting of the Medical Superintendents' Society will be held at B.M.A. House, Tavistock Square, London, on Saturday, April 1, at 2.30 p.m.

A Swiss Society for Tropical Medicine has been founded at Berne under the presidency of Dr. P. Thillot of Lausanne, and an Institute for Tropical Medicine at Basle.

Dr. Jolyot Curie, who was awarded the Nobel prize for chemistry in 1936 together with his wife, has been elected a member of the Paris Academy of Medicine.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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## ANY QUESTIONS?

## Vapour Density of Trichlorethylene

Q.—What is the vapour density of trichlorethylene?

A.—The vapour density of a substance is the weight in grammes of a litre of the vapour at N.T.P., divided by 0.09, the weight in grammes of a litre of hydrogen at N.T.P. In general terms, the molecular weight of a substance is twice its vapour density. The molecular weight of trichlorethylene is 131.38: therefore its vapour density is 65.7.

## Solids in the Infant Diet

Q.—At what month or weight should solid food be introduced into a baby's diet? Should a baby receive solid food at 4 months, as some authorities advise? Hitherto I have waited till 6 months or a weight of 15 lb. before advising solids, but health visitors returning from refresher courses are discussing earlier solid feeding.

A.—It all depends on what is meant by solids. It is a sound practice not to give solids until the baby is 6 months old, if by that is meant a meal of potatoes and gravy with milk pudding and risks; but from the fourth to the sixth month a little suitable vegetable purée may be given daily, or a little thin cereal introduced into one or two of the milk feeds. The trouble is that most people when given an inch take an ell, and if too much cereal is eaten by a young baby it will interfere with the absorption of calcium from the bowel. This answer begs the question, "What is suitable vegetable purée?" Mothers should be encouraged to find out intelligently for themselves.

## Wound Shock and Internal Haemorrhage

Q.—Is it possible to teach first-aiders to distinguish between the symptoms and signs of wound shock and of internal haemorrhage? Is, for instance, apathy characteristic of the former, restlessness of the latter?

A.—Most informed opinion now inclines to the view that haemorrhage is the major factor in the production of shock. The clinical picture is therefore essentially identical in simple haemorrhage and traumatic shock. Trauma, however, complicates the picture. Reflexes from the injured area, the pain or infection of peritonitis, the mechanical circulatory difficulty and the poor blood-oxygenation of chest wounds, the vagal stimulation and vasomotor-centre effects of head injuries may be added to the effects of simple bleeding. It is difficult enough even for the expert to unravel the complicated puzzle in any given case of severe injury, and it is certainly impossible to give any clear differentiation to first-aiders. They may be made to understand, however, that, while haemorrhage alone can produce the picture of shock, severe trauma is likely to make the condition even worse. The mental state seems to bear some relation to the blood pressure, apathy being present when the blood pressure is very low, and restlessness when the pressure is higher. The change from apathy to restlessness is often seen as the blood pressure recovers with transfusion.



## Origin and Treatment of Threadworms

Q.—Can you dispel some of my ignorance of threadworms? Where do they originate? Puppies have them when their dams do not. Are the worms in radishes threadworms? What is the best treatment?

A.—Man is the only known host of *Enterobius vermicularis*; other species of the same genus occur in monkeys, but not in dogs or other animals. A free-living nematode, *Heterodera radiclecola*, occurs in the roots of radishes; the eggs, when swallowed by man, are passed unaltered in the faeces, and this, in the past, gave rise to a fallacious description of "a new human threadworm, *Oxyuris incognita*."

Treatment is proverbially unsatisfactory, as is indicated by the variety of therapeutic measures recommended in the literature. Owing to the toxicity of the drugs used and the need for careful supervision to prevent reinfection, all forms of treatment are best carried out under hospital conditions. The following give the best results: (1) *Genitana violet*, oral treatment. The adult dose is 1 g. i.d., that for children 1 c.g. daily for each year of age, not chronological, age, the treatment to be continued for eight days: it should be combined with enemas, to wash the worms out of the large bowel. (2) *Hexylresorcinol*, oral combined with enema treatment. The dose is 1 g. for adults and children over 10; below 10 years, 0.1 g. for each year of age. The drug should be administered in hard gelatin capsules. If the oral dose is given in the morning, 1 soap-sud enema should be given the same evening, the latter to be followed by another enema of a 0.1% solution of hexylresorcinol crystals in water, which should be retained for fifteen minutes. More than one course of treatment may be necessary. (3) *Tetrachlorethylene* treatment is effective, but should be given only under hospital conditions. (4) Probably the most effective anthelmintic against the threadworm is *phenothiazine*, but its use is attended with considerable risk, and is probably justifiable only when other methods have failed. (See *Lancet*, Jan. 17, 1942, p. 86; and *British Medical Journal*, Feb. 7, 1942, p. 191.) The greatest problem is to prevent reinfection, and the treatment of one member of the family is futile if other members are infected. General hygiene is all-important. The patient should sleep alone and wear protective pants to prevent his hands touching the perianal region during sleep; underwear, towels, and bedding should be frequently washed and ironed; toilet seats should be scrubbed with cresol; finger-nails must be kept short and well scrubbed.

## Systolic and Diastolic Variations in Hypertension

Q.—In a case of high blood pressure, whether of the malignant type or of essential hyperplasia, is the difference between the systolic and the diastolic readings to be taken into account in assessing the gravity of a case? I have two cases and their B.P. readings are 190/180, 220/145. They are both cases of the essential hyperplasia type. While one would naturally regard the latter as the more serious of the two, does the enormous difference between the readings of the former case make the prognosis more grave?

A.—The diastolic pressure is generally regarded as being the better indication of the severity of the hypertension because it represents the constant load which the arterial system is carrying and it reflects more accurately the resistance of the peripheral vessels. In essential hypertension the rise of diastolic and systolic pressure is not necessarily a proportionate one. The prognostic significance of the absolute height is difficult to evaluate except in cases with a marked rise. Minor variations in pulse pressure are not of much significance because of the several variable factors involved, such as the rate and the output per beat of the heart. A great increase, such as a pulse pressure of 110, as in the first case mentioned above, is an indication of rigidity of the aorta and great vessels, the effect of severe arteriosclerosis. The prognosis in the first case is therefore that of a case of severe arteriosclerosis without any considerable degree of hypertension. In old individuals with a very rigid aorta such pulse pressures are not very uncommon.

## Turkish Baths

Q.—I should be grateful for information as to the therapeutic value of Turkish baths; what are the indications and contraindications?

A.—Turkish baths act by promoting free diaphoresis and increasing tissue metabolism, thus promoting the excretion by the skin of waste products and tending to loss of weight. Their beneficial effect will be enhanced by free drinking of water during the bath, without which much of the benefit may be lost: constipation, for example, may be caused by excessive dryness of the faeces, and thus intestinal elimination may be hampered. Blood pressure is at first raised, but falls as perspiration becomes established; the bath may therefore be found helpful in cases of moderately raised pressure, but is contraindicated if it is high or if there is arteriosclerosis. The eliminative action is beneficial in gout, but the amount of uric acid eliminated by the skin is negligible in comparison with that by the kidney. In

individuals with sluggish skin action this may be promoted; but if perspiration is not quickly induced unpleasant if not dangerous results may occur. People in sedentary occupations with no opportunity for adequate exercise find Turkish baths helpful, and the shampooing process is useful in this respect, especially if the muscles are well kneaded. The loss of weight, which may be considerable, makes the bath useful in the obese; but the weight is often quickly regained, and unless combined with a strict dietetic regimen the ultimate results may be disappointing. There is a general sedative effect beneficial in functional nervous disorders, and a sense of well-being should be experienced after the bath if it is suited to the case. Perhaps the best evidence in favour is the fact that such baths have had a vogue for at least 2,000 years, which would not have been the case had not the effect been generally beneficial.

These general observations will indicate in what conditions Turkish baths may prove useful, but a word of warning is necessary: if the bathrooms are not efficiently ventilated, cleansed, and disinfected regularly, unpleasant results may occur which are obvious enough without description.

## Exfoliative Dermatitis

Q.—I would like information concerning the diagnosis of exfoliative dermatitis. Is this the same as chronic pityriasis rubra? What treatment is considered most effective, and is anything known about the cause?

A.—The label "exfoliative dermatitis" covers a little-understood group of skin diseases in which there is widespread or universal inflammation and desquamation. Pityriasis rubra is applied to one variety. The exfoliation may be primary, or secondary to some pre-existing eruption, such as psoriasis, or follow ascertainable causes such as treatment with arsenophamine, or be associated with a blood disease (leukaemia). Simple local applications are best, such as boric vaselin; benefit sometimes follows small doses of a stock *B. coli* vaccine, or vitamin B complex.

## Ratio of Corpuscles to Plasma

Q.—On centrifuging blood, it is found that the relative volume of corpuscles to plasma is greater in venous than in arterial blood. What is the reason for that?

A.—The red blood corpuscles are not rigid bodies and their size may be determined from moment to moment by their water content. If R.B.C.s are placed in solutions which are not isotonic to them then water passes across the corpuscular membrane to equalize the osmotic pressures inside and outside the corpuscle. While passing through the capillaries blood takes up carbon dioxide, which is mainly combined inside the corpuscle, as  $\text{HCO}_3^-$ . Although some of the  $\text{HCO}_3^-$  ions migrate through the corpuscular membrane into the plasma, they are replaced by an equivalent number of  $\text{Cl}^-$  ions. The result is that the osmotic pressure of the corpuscular content is increased and water passes into the cell and increases its volume. When the blood passes through the lung and  $\text{CO}_2$  is evolved these processes occur in reverse order.

## Prognosis in Angioneurotic Oedema

Q.—What is the average behaviour of a case of angioneurotic oedema? Do attacks usually recur during a lifetime, or do they cease spontaneously after a time? Can a mortality rate be given for the disease?

A.—Once a person has suffered from one attack of angioneurotic oedema another attack may be expected any time during the remainder of his or her life. The initial attack occurs more commonly after 40 years of age than before, and may accompany or replace another allergic condition. The individual attacks depend upon two groups of factors: first, a specific sensitization to some drug, inhalant substance, or food; and, secondly, a group of factors that temporarily deplete the body's store of protective adrenaline, such as prolonged worries, mental upsets, frequent excitements, overwork, and fatigue. So long as the specific causes have been determined and avoided or removed, and the adrenaline-depleting factors rectified, further attacks are unlikely. No mortality rate can be given as statistics are difficult: some patients die in their first attack; others who get successfully through this immediately consult their doctor in the hope that the ordeal will not be repeated.

## Operation for Otosclerosis

Q.—A deaf patient has read of operations successfully performed which resulted in improvement in hearing. The operation appears to consist of fistulation of the semicircular canals. I should like to know if such treatment is practised to-day, and if so, with what success.

A.—Operation for the relief of deafness due to otosclerosis is based on the observation that an opening into one of the semicircular canals restores hearing, which diminishes again when the opening closes. The problem, therefore, has been to prevent the opening from closing. It is claimed that this can be done by an elaborate plastic operation which utilizes the membrana flaccida and the

membrana tensa with the adjacent part of the external auditory meatus to cover the opening. The opening is said to be more effective the nearer it is situated in the lateral semicircular canal to the vestibule at the anterior end. In order to make this flap lie over the opening, which is made under magnification with fine burrs, the head of the malleus and the incus must be first removed. Absence of any sepsis is essential to success. It is claimed that with a loss of about 50 decibels of hearing a lasting improvement of about 24 decibels on the average can be obtained in about 50% of the cases, and also that deterioration of the hearing may be arrested even if there is no improvement, as shown by persistence of a progressive deterioration in hearing on the opposite side. A rigid selection of cases is necessary, and the possible complications are evident: but these have not been numerous in the hands of those who have attempted these operations.

## INCOME TAX

### New Partnership

"I. B."—A and B commenced partnership shortly before April 5, 1942, B having before then been the sole proprietor. A notice of assessment shows that the partnership is assessed for 1942-3 on the amount of B's earnings for 1941-2. Is this satisfactory?

\* Yes. The rules with regard to cessation and commencement apply to the unit assessed—in such a case as this to the firm and not to the individual partners. As things stand A and B are jointly assessed for 1942-3 in the amount of B's earnings—presumably a smaller sum than the amount of their joint earnings in 1942-3. For example, suppose A to be entitled to one-third and B to two-thirds of the profits, and that B's earnings in 1941-2 were £1,500, then in effect A is charged tax on £500 for 1942-3 and B on £1,000, whereas their earnings may well have been greater. It depends on the figures, of course, but a claim to cessation resulting in both partners paying on their actual earnings for 1942-3 would probably be against their interests.

### Entering the Forces from Eire

"Y. Z." came to Great Britain from Eire on July 5, 1943. He earned £100 as a locum tenens between that date and October 10, 1943, when he joined the R.A.M.C. What is the basis of his liability?

\* Assuming that he has come to this country as an occasional resident and not with the intention of establishing a residence here, he is liable on his earnings in the United Kingdom (and on military pay issued from here even while not so resident), less, of course, the usual deduction for cost of uniform and personal allowance as a married man. He will not be liable on income arising in Eire or from the holding in 3% War Loan. There is no six-monthly period of grace—the six months only applies to income from abroad, and then only if residence in any one financial year does not exceed that period. He should make his return, through the Army Agents, as an occasional resident if that is the fact in his case.

## LETTERS, NOTES, ETC.

### Shock Therapy

DRS. MARGARET M. METHVEN and EDWARD S. STERN (joint secretaries, Child Psychiatry Group, Royal Medico-Psychological Association) write: From the correspondence in the *Journal* regarding shock therapy it appears that there is considerable misapprehension as to its uses. Convulsive therapy is suitable for certain mental disorders in adults, but although we have made inquiry, we are unable to trace a single case where it has been employed in children.

### Thiouracil for Hyperthyroidism

Dr. I. FRIEDMANN (London, S.W.1) writes: With reference to the treatment of hyperthyroidism with thiouracil (*Journal*, Feb. 26, p. 313) may I point out that the use of thiouracil must also be controlled by periodical counts of the white blood cells. In two cases treated in East Ham Memorial Hospital, a marked drop of the white blood cells to 2,000 per c.mm. with 50% lymphocytes followed a short course of treatment with thiouracil. Thiouracil discontinued, the thyroid glands were surgically removed. The histology showed the characteristic features of hyperthyroidism and signs of involution evidenced by cuboidal lining epithelial cells and deep-staining colloid.

### Children's Food Fads

The Hertfordshire County Council has published in a pamphlet the results of an inquiry undertaken by Mr. F. Le Gros Clark on the school child's taste in vegetables. The inquiry was made by an examination of some 400 school essays set at the county schools on "The Vegetables we Eat." The preferences expressed by the youngsters, who were mostly aged between 9 and 11, were very much what was to be expected. The majority dislike parsnips and swedes, turnips are not much more popular, carrots are favoured, though the sweet taste is objected to by some, onions are held in high

esteem, runner beans are well liked, but marrow is detested—"a slimy sort of vegetable," says one child. Children of such tender years are hardly expected to mention the nutritive qualities of food, but 20% of them did so, and about 6% trotted out the word "vitamin." But in spite of Mr. Le Gros Clark's ingenuity and patience there is a feeling that such a study is vitiated unless the kind of cooking with which the child is familiar is taken into account. "Heaven sends us good meat," said David Garrick, "and the devil sends the cooks." When the "meat" is vegetables he sends the worst cooks he has in his kitchen. We grow the best vegetables in the world and ruin them in the pot. The bias against greens among these children might easily be accounted for by the sodden tasteless messes put before them, and the indifference to potatoes, especially when boiled, may derive from the same cause. The school canteen can do much to eradicate food dislikes in children, with great advantage to their nutrition, especially if the mothers at home pay more attention to the saucepan and less to the children's whims.

### Ether as a Cleansing Agent for Wounds

Mrs. M. A. DOBBIN CRAWFORD, M.D., F.R.C.S.I., writes: Minor injuries being of greater importance in war than in peace, continued search is made for a method of treatment which will ensure the least possible disability and loss of working time. To obtain this result, a wound after treatment should be and should remain clean, dry, and undisturbed. The purpose of this note is to redirect attention to a method in use during the last war, apparently by-passed and forgotten. I have seen this method used most effectively during seven years of country practice and have used it during 18 months in a large factory. In the country—remote country, 40 miles from the nearest hospital—every type of injury was treated, the result of hunting, farm, road, and domestic accidents. Not one injury so treated developed sepsis. All the wounds healed by first intention or by clean granulation. A similar result obtained in factory practice. It is a method of extreme simplicity. It avoids the use of any water or antiseptic lotion. The cleansing agent used is ether; the method this:

- (1) The wound is covered by a sterile dressing while the surrounding skin is thoroughly cleaned with ether and sterile dabs.
- (2) The skin immediately around the wound is similarly cleaned.
- (3) Using a Silk's metal anaesthetic can, the wound is thoroughly irrigated with ether, any particle of dirt being removed with forceps or sterile wool.
- (4) Surrounded with sterile cloths the wound is then treated, any dead tissue excised, bleeding-points secured, skin accurately sutured.
- (5) Skin may have a final painting with merthiolate (formerly with iodine, which was also sometimes used in preparation of the skin).
- (6) Dry sterile dressing, to be undisturbed for at least five days, better still a week; if there is loss of skin preventing suture and not requiring graft, the final dressing is with sterile gauze and aerillavine emulsion, again left undisturbed for at least five days.

Similar treatment is used for burns of the first and second degrees. No anaesthetic is required if the blisters are intact. Thorough cleansing of the skin with ether and sterile dabs is followed by removal of the blistered cuticle and dressing with aerillavine and sterile gauze. This dressing is left undisturbed for at least five days while the burned skin heals without interruption; the blistered area will be found clean and dry, the reddened area healed. The patient is seen and is warned to report any pain, but the wound being comfortable is undisturbed. The pain caused during this treatment is not severe and is of short duration. The sting or smart is much less than that of spirit and causes no distress to the average patient who has suffered minor injury. Where the wound is larger or more severe anaesthesia will in any case be needed for repair. There is nothing new about this treatment. Ether was used as cleansing agent for wounds a quarter of a century ago. I saw a knee-joint which had been penetrated by the iron spike of a railing heal without any trouble after excision of the wound and reverse ether irrigation. Gynaecologists many years ago used ether as routine to clean the pelvic peritoneum contaminated by pus during laparotomy. Such experiences of this admirable agent leave me bound to prefer it to any watery solutions which soak the tissues. Their use I can only consider a regression in surgical technique.

### A Warning

During the past two years many complaints and inquiries have been received concerning a Norwegian medical woman, married to a British subject, who was temporarily registered in this country but whose registration has now been cancelled by the General Medical Council. Doctors who receive a visit from this lady would be well advised not to part with money.

### Corrigendum

In the *Journal* of March 18 (p. 411), under the heading "Pruritus Ani and Vulvae," in the "Any Questions?" section, there was a reference to "intensive treatment with vitamins A or B<sub>1</sub>." This should have read, "vitamin A or B<sub>1</sub>."

## AETIOLOGY AND TREATMENT OF CONVULSIONS DURING ANAESTHESIA

ABSTRACT OF A PAPER BY

W. N. KEMP, B.A., M.D.

(Vancouver, British Columbia)

The hypothesis advanced in this paper is that a convulsion or tetany occurring during anaesthesia, local or general, is essentially a muscular phenomenon, caused basically by interference with cell respiration in the brain. In the last analysis nerve-tissue respiration resolves itself into oxidation of glucose. Any factor—and usually several factors are operative at one time in a case of convulsions—which interferes with the vital processes of cerebral cell respiration may cause a convulsion in a patient undergoing operation under either general or local anaesthesia. In the case of local anaesthesia a relative or absolute overdose is needed to produce a convulsion. Briefly stated, it appears that failure of nerve-cell respiration creates a focus of efferent nervous discharge in the cerebral cortex which results in a convulsive seizure. The term "tetany," for the purpose of this discussion, is taken as synonymous with a convulsion of the Jacksonian type. The difference between "tetany" and "convulsions" seems to be one merely of degree.

The conception of failure of cerebral cell respiration as the cause of convulsions during anaesthesia is quite in keeping with the teaching of Penfield and Erickson,\* who state that "when anoxia reaches a critical level it becomes irritating to the central nervous system." The theory also conforms to the teaching of Hughlings Jackson, who maintained that, basically, there was only one physiological cause of epilepsy.

The first cases of ether convulsions were reported in 1927, but it had been known for many years that frank anoxaemia could, and frequently did, cause epileptiform movements and "jactitations" during the administration of nitrous oxide anaesthesia. But the occurrence of convulsions in patients whose blood was not noticeably anoxic is a complication of ether anaesthesia now being reported with increasing frequency, and a phenomenon which to date has baffled solution. Many theories have been advanced in explanation (see Table). Current textbooks on anaesthesia reflect the prevailing lack of unanimity as to aetiology and treatment.

Although convulsions during ether anaesthesia were not unknown before 1927, they were certainly not common before 1924. I had a case (Case 1, below) in that year, but a search of the literature at that time failed to reveal another. In 1927 Pinson, Hornabrook, and Gwathmey recorded cases, and from then onwards cases were reported more frequently, many different causes being suggested. From the list in the Table the divergence of opinion as to the aetiological factor or factors is noteworthy, but in my opinion it only appears to be a divergence. These diverse factors are contributory or accessory, the main or precipitating cause of the convulsion being tissue anoxia arising from acapnia and alkalaemia—a point to be developed later.

Judging from the multiplicity of suggested convulsion-producing factors in the Table, it is probable that no single factor is the cause. Possibly the convulsions may be due to one primary factor—namely, interference with cerebral tissue-

List of Writers reporting Cases of "Deep" or "Late" Ether Convulsions, with Suggested Causes\*

Reporter	Date	Suggested Cause or Causes
Pinson .. ..	1927	Warm ether vapour, CO <sub>2</sub> excess, toxæmia
Hornabrook ..	1927	Atropine overdose
Gwathmey ..	1927	Anoxæmia
Wilson .. ..	1928	Acetaldehyde and peroxides
Clement ..	1928	Anoxæmia
Thomas .. ..	1928	Overdosage of ether
Walton .. ..	1928	Acetaldehyde, peroxides, and toxæmia
Hadfield ..	1928	Idiosyncrasy to ether
Mennell ..	1928	Over-oxygenation
Clarke .. ..	1931	Congestion of brain
Mackenzie ..	1931	Acute toxæmia
Kemp .. ..	1932	Alkalosis precipitated by acapnia
Wright .. ..	1933	Heatstroke
Bowman ..	1934	Overdosage of ether
Nix and Garcia	1934	Heatstroke
Rosenstine ..	1935	Surgical trauma
King .. ..	1935	Idiosyncrasy and sepsis
Woolmer and Taylor	1936	Heatstroke
Smith .. ..	1936	Heatstroke
Hoseason ..	1936	Low blood calcium
Tovell and Rosenow	1936	Neurotoxin from streptococci
Hewer .. ..	1938	Excess CO <sub>2</sub>
Dodd .. ..	1939	Over-atropinization and diminished heat-loss of sweating
Park .. ..	1940	Cerebral congestion
Bennan .. ..	1941	Neurogenic stimulus in hyperpyrexial patient
Tye .. ..	1942	Fear: sepsis; hyperpyrexia; overdosage of atropine

\* Called "deep" and "late" to distinguish them from ether clonus, an innocuous and not uncommon phenomenon of light ether anaesthesia. It is not impossible—indeed, it is very probable—that ether clonus is due to the same cause, in mild degree, as the so-called "deep" or "late" ether convulsions.

cell respiration, brought on by alkalaemia, which is known to cause a form of occult anoxia from failure of the oxyhaemoglobin (OxyHb) of the blood to release its oxygen to the nerve tissues. The alkalaemia is directly due to acapnia (CO<sub>2</sub> deficit) incurred by pulmonary over-ventilation, which in turn is fostered by fear (inadequate sedation), over-atropinization, toxæmia, and elevated metabolism, together with the use of ethyl ether administered by a semi-open technique.

### Case Reports

[Here in the original paper followed detailed reports of eleven cases, all of which had come within the writer's personal experience, although he was not in every instance the anaesthetist in charge of the case. Four, which seem to be typical, are given.]

Case 1.—1924. A female aged 46. Operation:—Exploratory laparotomy and posterior gastro-enterostomy for perforated duodenal ulcer. Anaesthesia:—Ether vapour, with O<sub>2</sub> and semi-open ether technique with mask and damp towels. Convulsions occurred during peritoneal closure after 75 minutes' anaesthesia. Treatment:—Intravenous saline. Convulsions ceased in 20 minutes: uneventful recovery.

Case 2.—1931. A male aged 35. Operation:—Laparotomy and primary closure of perforated gastric ulcer. Anaesthesia:—Intra-

\* Quotations from *Epilepsy and Cerebral Localization*, by Penfield and Erickson (1941), are freely used by kind permission of the publisher, Charles C. Thomas, Springfield, Ill. (Baillière, Tindall and Cox, London agents).

tracheal ether-vapour insufflation with  $O_2$  and no rebreathing. Anaesthesia had continued for 35 minutes and the surgeon was suturing the peritoneum in closure when convulsive movements started in right side of face and spread to right arm and abdominal muscles. Ether was discontinued; the mask of a gas machine was applied to the patient's face and he was made to rebreathe  $O_2$  and his own  $CO_2$ , there being no other  $CO_2$  available in the hospital at the time. Within 5 minutes convulsive movements had ceased and the abdominal closure had been completed. A catheter specimen of urine taken immediately was found to be alkaline. Uneventful recovery.

**Case 3.—1942.** A male aged 29. **Operation:**—Skin graft to face. **Premedication:**—Omnopon gr. 1/3 and scopolamine gr. 1/150, subcutaneously one hour before operation. **Anaesthesia:**—Induction by 0.75 g. pentothal sodium (5%) intravenously, followed by endotracheal administration, with closed circuit circle filter of  $CO_2$ , of  $N_2O$  and  $O_2$ , plus ether vapour. Convulsive movements of legs, abdominal muscles, and arms noted 30 minutes after starting anaesthesia. Blood was hypoxic, and had been so for some time according to surgeon's report. Convulsive movements ceased immediately when the oxygen content of the inhaled mixture was increased to 100%. No further convulsions when anaesthesia with large safety margin of oxygen was continued. Post-operative recovery uneventful.

**Case 4.—1943.** A male aged 26. **Operation:**—Skin graft to left hand. **Anaesthesia:**—Intratracheal nitrous oxide-ether-oxygen following intravenous pentothal sodium (0.5 g.). Closed filter circuit used. When I took over this case anaesthesia had been induced 45 minutes previously and the course had been normal. Pulse was rather faster than usual—110 a minute—and the colour was somewhat dusky. Patient was in second plane of third stage of anaesthesia. Respirations relatively shallow, 14 per minute. Within another 5 minutes of this regimen a violent ether clonus of both the lower extremities started. This was readily controlled by simply doubling the previous  $O_2$  intake and cutting out the  $CO_2$  filter without altering the plane of the anaesthesia. Within 2 minutes the clonus ceased, and within 10 minutes the pulse was down to 90 a minute and the patient's colour was pink.

#### Abnormal Physiology of Clinical Cryptogenic Conditions\*

Penfield and Erickson (1941) have ably reviewed this subject. They divide epilepsy into symptomatic and cryptogenic. The former includes cases in which known aetiological agents, such as brain tumour, scar formation, etc., cause or predispose to convulsions; the latter, that large group of "essential" or idiopathic epilepsies in which the cause cannot at present be found. Consideration of the known factual data as stated by Penfield and Erickson concerning the cryptogenic group may be expected to throw light upon the problem of convulsions during anaesthesia.

Cryptogenic epilepsy begins with an abnormal neuronal discharge in the vicinity of a demonstrably abnormal focus within the central nervous system—what Hughlings Jackson called "the local discharge of grey matter." Holmes pointed out that "local" epilepsy may be focal motor epilepsy, focal sensory epilepsy, visual epilepsy, or auditory epilepsy. For the purpose of this discussion attention will be focused on the first of these varieties. Jacksonian or focal motor seizures are characterized by local movements of some part of the body; in a "Jacksonian march" the spread of movements from one part of the body to another is produced by spread of discharge up and down the precentral gyrus of the cerebral cortex. In the cases cited above the seizures were characteristically Jacksonian in type, beginning with the facial muscles and extending to the abdominal region.

[Here the writer, by means of a series of direct quotations from Penfield and Erickson, drew attention to the clinical data and neurological opinions to be considered:]

"Any normal brain may be the seat of epileptic discharge if it be subjected to the appropriate influence from without."

"More important than electrical rhythm are the causes of the change in cell chemistry that produce dysrhythmia and also the clinical manifestations of epilepsy."

"Studies of the cerebral tissues show that brain metabolism is relatively high. Blood flow through the brain seems to be rapid."

"Blood-flow increases [through the cortex during normal functional activity of any cortical area] would seem to be due to vasodilatation resulting from the presence in the tissue of carbon dioxide, produced by the increased activity of ganglion cells."

\* That is, ordinary cryptogenic epilepsy occurring in patients not under anaesthesia.

"Carbon dioxide in the cerebral tissue causes the local blood vessels to dilate promptly. . . . It [the mechanism] provides increased blood at the time of functional increase and guards against local anoxia which might otherwise occur. . . . Brain metabolism and quantitative supply from the blood stream are quite accurately balanced under normal conditions."

"Complete arrest of the cerebral circulation results almost invariably in a small convulsive seizure. . . . This would indicate that when anoxia reaches a critical level it becomes irritating to the central nervous system."

"Formijne (1938) observed that convulsions occur after the period of asystole. His graphic records indicate that during asystole there is a continuance of respirations with a hyperventilation of the blood stagnated in the lung. With resumption of cardiac function the hyperventilated blood circulates through the respiratory centre and there is a period of apnoea. Convulsions which occur at this same time were therefore ascribed by the author to the action of blood upon the brain. When  $O_2$  and 5%  $CO_2$  were inhaled convulsions failed to occur under these conditions."

"It [hyperpnoea] will precipitate grand mal attacks in from 5 to 30% of the cases. Petit mal seizures are much more easily induced by hyperventilation."

"The plasma pH has been observed by a number of investigators to shift towards the alkaline side prior to the onset of seizures."

"Oxygen and 5% carbon dioxide should be administered if there is cyanosis."

This last procedure was suggested by me (Kemp, 1932, 1933) as one to be followed regardless of the patient's colour—that is, whether he is cyanosed or otherwise.

#### Experimental Considerations

When the parathyroid glands are excised from dogs the thyroid, for anatomical reasons, is always removed as well, and in due course, under ordinary conditions, the dogs develop tetany. This sequel can be controlled by intravenous infusion of calcium chloride solution or by physiological sodium chloride solution. The mere placing of the dogs in a cool room (where they do not pant) has been found to prevent the tetany which otherwise follows thyro-parathyroidectomy, the reason being that a dog, unable to perspire, can lose heat only through its respiratory tract, and when placed in a warm, humid room pants and develops acapnia and alkalaemia, which produce increased muscular tone and convulsions if the dog is predisposed by having a low blood calcium.

Not the least important purpose of breathing is the maintenance of the normal H-ion concentration of the blood. Conditions of clinical acidalaemia or alkalaemia are an increase in this concentration stimulates the respiratory centre. A fatal acidalaemia implies, as Rowntree has well expressed it, an H-ion concentration as "acid as distilled water," and a fatal alkalaemia one in which the blood is as "alkaline as tap-water." Acidalaemia may be due to an increase in the  $H_2CO_3$  or a decrease in the bicarbonate ( $BHCO_3$ ); alkalaemia may be due to a fall in the  $H_2CO_3$  or an increase in the bicarbonate.

#### Clinical Alkalaemia

Wright (1940) points out that there is a tendency towards alkalaemia when excessive breathing at rest occurs owing to voluntary hyperpnoea, to exposure to high temperature and humidity, to lack of oxygen, and, in some cases, to infantile diarrhoea and vomiting; also when the bicarbonate of the blood is increased owing to an overdose of bicarbonate or to pyloric or high intestinal obstruction. Alkalaemia may occur in heat stroke caused by exposure to excessive humid heat. The body in such a condition attempts to lose heat by increased breathing, and the over-ventilation results in acapnia and alkalaemia. This may go on until the heat-regulating mechanism breaks down, the rise in temperature stimulates metabolism, heat production is still further increased, and a vicious circle is established (Fig. 1).

It is reasonably well established that voluntary over-ventilation causes a tendency to alkalaemia (Collipt), and hyperventilation during semi-open anaesthesia may cause acapnia and alkalaemia, a blood pH of 7.7 having been recorded (Adriani 1942). It now remains to show how alkalaemia in the presence of normal blood Hb oxygenation—the usual finding in cases of deep ether convulsions—can cause tissue anoxia and con-

† Personal communication.

ulsions. A consideration of the well-proved data summarized in the haemoglobin dissociation curve (Fig. 2) shows that when tissue activity is markedly increased and the  $O_2$  tension of venous blood falls to 15 or 20 mm. Hg, the blood gives off 70 to 80% of its  $O_2$ , greatly increased quantities of which are thus supplied to the tissues. The presence of  $CO_2$  lowers the

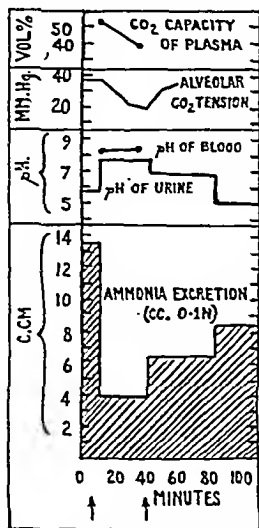


FIG. 1.—Effect of voluntary hyperpnoea on alveolar air, blood, and urine, showing compensatory reactions to alkalaemia. (Grant and Goldman, *Amer. J. Physiol.*, 1920.)

*Abcissa.*—Time in mins. *Ordinates.*— $CO_2$  capacity of plasma (bicarbonate content) in volumes of  $CO_2$  per 100 c.c.m. plasma. Alveolar  $CO_2$  tension in mm. Hg. Reaction of blood and of urine expressed at pH. rise means increased alkalinity. Forced respiration begins at 10 mins. and ends at 38 mins. (period indicated by arrows). At 31 mins. tingling of foot; at 34 mins. Trousseau's sign present; at 35 mins. both hands in spontaneous spasm; at 36 mins. slight spasm of feet; at 42 mins. temporary dizziness and trembling of hands on standing up after period of forced respiration is over. Note that pH of blood rises in spite of compensatory reactions of kidney.

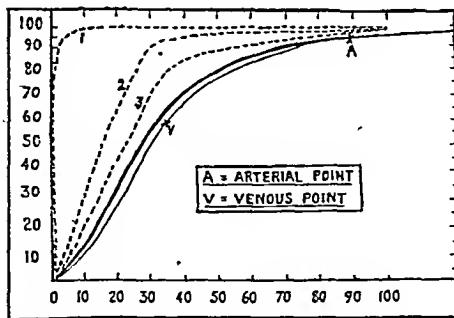


FIG. 2.—Diagram to illustrate the behaviour of solutions of haemoglobin and of blood under different conditions.

*Abcissa.*—Tension of oxygen in mm. Hg. *Ordinates.*—Percentage saturation of haemoglobin and oxygen. *Dotted lines.*—Haemoglobin solutions: (1) Room temperature and no  $CO_2$  tension; (2) body temperature and no  $CO_2$  tension; (3) body temperature and 20 mm.  $CO_2$  tension. (After Barcroft.) *Continuous lines.*—Blood: Thick line—in presence of constant pressure of 40 mm.  $CO_2$ . Thin line—dissociation curve in body when disappearance of oxygen is accompanied by increase of  $CO_2$  pressure which facilitates dissociation of haemoglobin. (After Haldane.)

From *Applied Physiology* (Wrist)

threshold of  $O_2Hb$  dissociation, and thus provides increased quantities of  $O_2$  from venous blood. It would seem from a consideration of these data that a convulsion during ether anaesthesia is a defence effort on the part of the body temporarily to stop pulmonary respiration and exhalation of  $CO_2$  and actually to create  $CO_2$  and lactic acid by muscular action in order to correct the alkalaemia which causes failure of dissociation of  $O_2Hb$  and the anoxia which in turn leads to inhibition of nerve-cell respiration.

## Discussion

At least a dozen factors may influence and limit nerve-cell respiration during ether anaesthesia. These include low oxygen percentage in the inhaled atmosphere; physical obstruction of the patient's airway; subnormal tidal pulmonary exchange; decreased vital capacity; some barrier to normal diffusion between alveolar air and the blood in the pulmonary epithelium; failure in the  $O_2$  transport system; disturbances of tissue respiration; excessive pre-operative pulmonary over-ventilation, and various pre-operative conditions. Furthermore, these also include many secondary or subsidiary contributing factors—as, for example, avitaminosis; prolonged vomiting; secondary anaemia; under-sedation, which allows fear to produce over-ventilation and a tendency to alkalaemia even before anaesthesia has begun. An open or semi-open method of ether administration, while it prevents free access of atmospheric air, allows a  $CO_2$  deficit to be established, assisted by over-ventilation, and thus may be a contributory factor. The use of ether, in itself a respiratory stimulant, may cause over-ventilation and acapnia when Nature requires under-ventilation and  $CO_2$  conservation: it also causes suppression of renal function, and thus the long-term mechanism of blood H-ion regulation is rendered inactive at a time when diuresis and alkali elimination are very much needed. During the administration of semi-open ether anaesthesia, unfortunately for the H-ion regulatory mechanism for controlled elimination through the kidney, the secretion of urine is inhibited by the antidiuretic hormone of the pituitary gland or by some other factor related to the anaesthetic, and no adjustment of the H-ion concentration of the blood can occur by the normal renal mechanism. As we have seen, the only remaining mechanism of H-ion adjustment—that of retardation of respiration—is frustrated by the forced respiratory stimulation attendant upon ether in the blood stream and the stimulating effects which fever, a moist and warm atmosphere, surgical trauma, and the several other factors, some of which are indicated above, have upon the breathing.

Thus a convulsion under ether anaesthesia may be inevitable because the two normal H-ion-regulating mechanisms are both inhibited or subjected to marked interference. There is nothing else for Nature to do but to "seize hold" of the situation and stop respirations and  $CO_2$  loss by attempting a major epileptic seizure while at the same time producing more  $CO_2$  and lactic acid by means of excessive muscular contractions in an effort to counteract the acapnia and alkalaemia which cause cerebral cell anoxias and convulsions.

Taylor (1940) has reported that in a total of 33,777 administrations of cyclopropane and oxygen in the Wisconsin General Hospital and at the Bellevue Hospital, New York, apnoea requiring respiratory stimulation occurred in 248 cases (0.7%) and convulsive movements in 39 cases (0.1%). As cyclopropane is always administered by a "closed" technique, usually in the presence of adequate oxygen, the occurrence of convulsive movements in 0.1% of these cases might be construed as an argument against the theory of acapnia and alkalaemia as the primary cause of convulsions under inhalation anaesthesia. A further study of available data, however, suggests that Taylor's statistics reinforce rather than refute the theory; but owing to lack of space this cannot be further developed here.

## Treatment of Convulsions occurring during Anaesthesia

Treatment is primarily prophylactic, and consists in avoiding open and semi-open administration of ether, particularly when any of the secondary convulsion-producing factors enumerated above are present, and in avoiding large doses of local anaesthetic drugs. Before any operation the patient's urine is usually examined with particular attention to the question of albumin, casts, and white or red blood cells. This urinary investigation should also include a reasonably accurate report on the pH of the urine so that the anaesthetist would be warned of an incipient tendency to alkalaemia. In non-emergency cases the NH<sub>4</sub> excretion could also be reported with advantage, and for the same reason.

The actual treatment of the convulsions *per se* includes:

1. Immediate inhalation of 5%  $CO_2$  and 95%  $O_2$  by a face mask and rebreathing bag.



2. If this does not bring about cessation of convulsive movements within a few minutes, intravenous sodium pentothal in 2.5% or 5% solution (or hexobarbitone or sodium amytal) should be administered in addition to the inhalation therapy described above, and in a dosage adequate to control the convulsion.

3. As soon as the convulsion is brought under control an intravenous infusion of glucose-saline (10% glucose in normal saline) should be started for the purpose of promoting renal function and restoring the normal kidney mechanism of H-ion adjustment (that is, the elimination of excessive basic phosphates and bicarbonates *via* the urine). One litre of glucose-saline might well be given to an adult and 500 to 750 c.cm. to a child. Once the convulsion is under control the anaesthetic and operation may be continued, with the early termination of the latter always in mind.

4. If facilities are available the patient's blood pH and/or the pH of the urine should be checked within an hour after the convulsion ceases, and CO<sub>2</sub> and O<sub>2</sub> inhalations should be given to the point of hyperpnoea or for 5 minutes every half-hour until such time as the blood pH is below 7.5 or an acid urine is being secreted. The reaction of the urine is not as accurate an indication of alkalaemia as the blood pH.

5. Before the patient is returned to bed 2 to 3 dr. of ammonium chloride in six times that volume of water should be instilled by gastric tube into the stomach.

6. As soon as the patient is able to swallow he should be given cool drinks freely, but in small quantities at one time. The basis of the drinks should be physiological saline. Prior to this, rectal saline is indicated.

7. The patient must be kept cool—if possible, in an air-conditioned room; or, failing that, an electric fan may be placed on face and torso.

8. If his temperature remains higher than 102° F. and the atmosphere is warm and possibly humid, a wet sheet may be placed on the patient's thorax and abdomen and a stream of air directed thereon from an electric fan.

9. If his temperature is persistently higher than 102° F. and respiration continues to be rapid, cold 5% glucose-saline enemata may be administered in addition to the measures mentioned above.

10. Inhalations of 5% CO<sub>2</sub> and 95% O<sub>2</sub> must be instituted on the first sign of any facial or other twitching.

#### Summary and Conclusions

Convulsions occurring during the administration of general or local anaesthetic drugs are primarily due to interference with or inhibition of cerebral cell respiration.

The interference or inhibition is usually caused by (i) frank anoxaemia; (ii) occult tissue anoxia due to alkalaemia and acapnia; or, as when local anaesthetic drugs are used, by (iii) the toxic action of the drugs inhibiting the oxidation-reduction enzymes of the tissues.

The principal treatment is prophylactic.

Emergency treatment is outlined.

#### BIBLIOGRAPHY

- Adriani, John (1942). *Pharmacology: Anaesthetic Drugs*, Chas. C. Thomas, Springfield, U.S.A.  
 Barron, E. S. G. (1939). *Physiol. Rev.*, 19, 184.  
 Featherstone, H. W. (1941). In *Modern Anaesthetic Practice*, p. 41, Eyre and Spottiswoode, London.  
 Guedel, A. E. (1937). *Inhalation Anesthesia*, The Macmillan Company, New York.  
 Hewer, C. L. (1943). *Recent Advances in Anaesthesia and Analgesia*, J. and A. Churchill, London.  
 Keilin (1933). *Ergell. Enzymforsch.*, 2, 239.  
 Kemp, W. N. (1932). *Brit. J. Anaesth.*, 9, 169.  
 (1933). *Anesth. & Analges.*, 12, 1.  
 Penfield, W., and Erickson, T. C. (1941). *Epilepsy and Cerebral Localization*, Baillière, Tindall and Cox, London.  
 Stormont, R. T., Hathaway, H. B., Shideman, F. E., and Sievers, M. H. (1942). *Anesthesiology*, 3, 369.  
 Taylor, Ivan B. (1941). *Ibid.*, 2, 645.  
 Tye, J. P. (1942). *Sth. med. J.*, Nashville, 35, 339.  
 Wright, Samson (1940). *Applied Physiology*, 7th ed., Oxford University Press, London.

According to *Presse Médicale* the number of cases of venereal disease in France in 1942 increased by 55% over the figure for 1941. In the Beurmman dispensary 369 fresh cases of syphilis were seen, as against 214 in 1941. In the Department of the Loire the numbers of fresh cases of syphilis for the years 1938 to 1942 rose as follows: 47, 60, 93, 126, and 193.

## HYSTERICAL SEQUELAE OF INJURIES

BY

P. D. SCOTT, M.B., B.Ch.  
*Surg. Lieut., R.N.V.R.*

AND

PAUL MALLINSON, B.M., B.Ch., M.R.C.P.  
*Surg. Lieut.-Cmdr., R.N.V.R.*

(From a Naval Neuropsychiatric Unit)

There is a general appreciation of the influence of hysterical mechanisms in prolonging and intensifying all kinds of ill mental and physical, in Service patients. Where symptoms persist, although there is no longer any evidence of organic disease, the possibility of hysterical prolongation is seldom overlooked. On the other hand, where abnormal physical signs persist despite thorough and rational treatment (especially these signs are definite and striking) psychogenic factors are apt to be neglected. This neglect, with the resulting delay in diagnosis, may be due, in part, to the relative rarity of conversion symptoms in this war compared with the last.

Many factors have probably contributed to the decline in the incidence of hysteria as a primary diagnosis and of conversion symptoms in particular. Of these, the reorientation of psychiatric opinion that has taken place in the intervening years is perhaps one of the most important. It can scarcely be doubted that the form of many hysterical manifestations was largely the product of medical expectation and of medical examinations carried out with preconceived ideas. The search for definite hysterical symptoms and specific hysterical "stigmata" has given place to psychobiological methods with their emphasis upon the assessment of the total personality. For example, as has been pointed out by Stephenson and Cameron (1943), the general recognition of the anxiety state, the early diagnosis of this condition, and its acceptance as a illness requiring and amenable to treatment have tended to make the development of gross physical symptoms, as it were unnecessary.

#### Case Material

The present paper is concerned with a series of six cases all of which were admitted to this hospital during one quarter in 1943, in which a striking and distinctive hysterical disability followed injury to the hand or arm. The clinical picture—a cold, blue, weak hand with impaired superficial sensibility—was rarely enough encountered in an annual turnover of some 1,400 neuropsychiatric admissions to make the series a memorable one. There can have been no possibility of contagion, since all the cases developed in widely separated units or establishments. The following clinical features were shown by the series as a whole:

In all six cases the hand was cold, subjectively and objectively and cyanosed; power was markedly impaired; the skin was soft and shiny. In five of the cases superficial sensibility was impaired or abolished up to a line round the long axis of the limb (in the sixth case the area of diminished sensibility corresponded with the distribution of the ulnar nerve). In four of the cases frank swelling of the hand was present. Disturbances of sweat secretion were spontaneously reported: "I does not seem to sweat properly"; "It sweats more, and feels either very hot or very cold"; "It sweats more"; "Seem dry." The finger-nails were abnormal—in two cases they were thickened, and in two others badly bitten. Repeated injury to the limb had occurred; plaster-of-Paris immobilization had been employed (three of these cases had fractures). In three of the cases there was immobility of interphalangeal or metacarpo-phalangeal joints due to muscular spasm; and spontaneous pain, described as burning or cramp-like, variable in site and intensity.

It is noteworthy that in five of the cases manual dexterity of a rather high order was an essential requirement for carrying out the rating's special duties.

*Case 1 (Wireman, aged 22).*—In July, 1942, this rating fell and dislocated his right elbow. Reduction of the dislocation was followed by limitation of movement at the elbow for some months. In Jan. 1943, after a second fall on to the same elbow, movements again became limited and painful. Detachment of the common extensor origin was demonstrated radiologically, and this was successfully

replaced at operation on Feb. 2. He was then treated with plaster-of-Paris immobilization and an arm-sling for five weeks. At the end of this period there was almost complete loss of voluntary movement in the elbow, wrist, and hand, and he could not abduct the arm at the shoulder. In addition the hand was cold, blue, and slightly swollen. Sensibility to cotton-wool and pin-prick was absent up to a line around the middle of the forearm. This condition persisted until the middle of March, at which time all the muscles gave normal electrical reactions; but he would not use the arm or hand even to feed himself, and the diagnosis of hysterical prolongation of a healed injury to the elbow was made. Full voluntary movements were regained in one session of explanation and persuasion; exercises and P.T. were given for three weeks, when he was discharged to duty with no residual disability.

**Case 2 (Able Seaman, aged 25).**—This rating broke his leg in 1934 and recovered without any residual disability. In 1939 he injured his left hand, which became swollen. He was told that he "had a ganglion" and was given four months' light duty, thus missing his ship. The hand returned to normal during this period. In Aug., 1942, a 4-in. shell fell on to the back of his left hand. Pain and swelling followed, but there was no bone injury. The hand was immobilized in plaster for five weeks, after which, in spite of intensive physiotherapy, it became cold, blue, and swollen up to a line two inches above the wrist. The radial artery pulsed normally, but capillary return in the hand was sluggish. The hand felt stiff, and movements were weak and slow. Superficial sensibility was impaired in a patchy fashion, approximately over the glove area; the upper limit of the impairment coincided with that of the cyanosis and swelling. The nails were thickened and the hand was dry and cold to the touch. He said that when the hand warmed up it did not seem to sweat properly. He also complained of burning pain, mainly in the third finger. Eight months after the injury a diagnosis of hysteria was made, and a month later, following explanation, persuasion, exercises, and physiotherapy, he was discharged to duty with a normal hand.

**Case 3 (Leading Wireman, aged 24).**—In March, 1941, this man sustained a left Colles fracture with fracture of the scaphoid. Good union was secured after five months' immobilization in plaster-of-Paris. Pain and numbness persisted in the wrist, but he was able to carry out full duties. In June, 1942, a second accident caused the scaphoid to be fractured again; once more good union was obtained by immobilization in plaster. Convalescence was prolonged owing to persistent pain and numbness of the wrist and hand, which became cold, blue, shiny, and swollen, with thickening of the nails and loss of sensibility to cotton-wool and pin-prick of glove distribution. All movements of the hand were equally weak, but there was no muscular wasting. A diagnosis of hysteria was made nine months after the second injury; five weeks later he was discharged to duty with a normally functioning hand and symptom-free.

**Case 4 (Air-fitter, aged 22).**—This right-handed rating had a congenital deformity of his right hand (fusion of the fourth and fifth metacarpals and of the lunare and hamate bones). He had been self-conscious about the deformity since boyhood, but it had caused no disability until, at the age of 17, he began to experience difficulty in performing fine movements with the hand and started to use his left hand for writings. He joined the Navy in Jan., 1940, and stood up to a long period of arduous and dangerous service in aircraft carriers, managing to perform his duties without too much difficulty, although still using his left hand more than his right. In Aug., 1942, during severe enemy action, his right hand was caught between a shell and a bulkhead. The injury was slight, causing a small bruise, but from this time he became unable to hold anything in his right hand, which subjectively felt cold and was held in the "claw" position. On this account he was drafted ashore, where the symptoms improved a little until he was required to work on and accept responsibility for the servicing of a type of aircraft which was new to him. He said: "I can't work on fighter aircraft, because my hand goes stiff; I might make a slip-up and get into serious trouble." On admission to this hospital in May, 1943, his right hand was cold, blue, and showed typical glove anaesthesia; the fingers were held in the "claw" position with the thumb adducted. The grip was weak and there was a spasm of the antagonists. A diagnosis of hysteria was made, and after one week's treatment he was writing well with his right hand (for the first time for five years) and had good insight. He was discharged to duty.

**Case 5 (Petty Officer Motor Mechanic, aged 25).**—Two days after he joined the Navy in Aug., 1940, an accident occurred in which he fractured his left elbow, which was immobilized in plaster for eight weeks. Uninterrupted recovery ensued. In June, 1941, soon after joining a motor attack craft, he had to be drafted ashore because, when working below decks at sea, he became anxious and complained of dizziness, weakness, nausea, and excessive sweating. In Oct., 1942, his right arm was crushed between two boats, the shaft of the ulna being fractured. The arm was immobilized in plaster for about four months. On removal of the plaster the arm was weak and movement at the elbow limited. Attempts to move the arm were

painful. Three months later he still complained of pain in the forearm and of stiffness of the elbow, which was then fixed in full flexion by muscle spasm. Hand movements were very weak and painful. The hand was cyanosed and the skin soft and moist. There was impairment of superficial sensibility of glove distribution. The nails were badly bitten. The right hand sweated more than the left and felt subjectively either very hot or very cold. A diagnosis of hysteria was made seven months after the injury; fourteen days later, during which he received psychotherapy, full function was restored and the signs and symptoms had disappeared. He was then discharged to duty.

**Case 6 (Sick-berth Attendant, aged 33).**—In Aug., 1942, he received shrapnel wounds while serving in a landing craft engaged in the Dieppe raid. One tiny fragment pierced the dorsal aspect of his right hand, where it remains, causing no symptoms. A second small fragment passed superficially to the right ulnar nerve from left to right, lodging in front of the internal epicondyle of the humerus. Healing of the wounds was rapid and complete, but the right hand and wrist became "completely paralysed," and the ulnar side of the hand and wrist was tender on pressure and spontaneously painful. A month later he complained of burning pain, numbness, and tingling of the ulnar side of the hand. He could not extend the fourth and fifth fingers, and passive extension caused pain. The fingers could not be adducted to the third finger. The ulnar nerve was felt to be thickened at the elbow. All movements of the hand were weak, but there was no appreciable wasting. Flexor carpi ulnaris, palmaris brevis, adductor pollicis, interossei, and lumbricals responded normally to faradic and galvanic stimulation, but the fifth tendon of flexor digitorum profundus did not respond to faradism. Sensibility to cotton-wool and pin-prick was diminished in the distribution of the ulnar nerve. The hypothenar eminence was tender on pressure. The whole hand was swollen up to the level of the proximal wrist crease. It was cold and cyanosed and the skin was shiny. Sometimes the hand was found to be sweating more than the left. The finger-nails were bitten. A diagnosis of co-contraction of the ulnar nerve was made and physiotherapy was given, but without improvement. By Feb., 1943, the condition was worse, and the fourth and fifth fingers were so flexed upon the palm as to resemble a Dupuytren's contracture. At this time his attitude towards his symptoms was very complacent; he displayed an amused and faintly contemptuous tolerance of the attempts that were made to treat his hand. His knowledge of the presence of an organic lesion and of its nature made psychotherapy the more difficult; but one month after psychotherapy was started he had become co-operative, showed fair insight, and had a hand normal in function and appearance, with full extension of the fingers. Some tenderness on pressure over the hypothenar eminence remained. He was then discharged to duty.

### Diagnosis

This will be considered under three headings:

#### 1. Physical Signs and Symptoms

The principal features have been enumerated above. In all the cases recovery from the original injury had proceeded beyond the point when the residual disability could be directly attributed to it. The uniformity of the physical signs was remarkable, and the clinical picture, when seen, was distinctive enough to bring hysteria to mind at once in the consideration of the differential diagnosis of any similar condition. The striking vasomotor disturbances led, before the diagnosis had been established, to a proposal to perform sympathectomy in Cases 2, 3, and 6. Tests were done in order to assess the probable efficacy of this measure. In Cases 2 and 6 an injection of novocain was made into the stellate ganglion, with immediate temporary relief of symptoms together with the production of a Horner's syndrome.

Physical findings which suggested a "functional" origin were: normal electrical reactions of the muscles; the typical "glove" distribution of the anaesthesia; spasm of the antagonist muscles; absence of appreciable wasting; and the exclusion of arterial disease, arthritis, and the major endocrine and neurological disorders, such as syringomyelia and tabes, in which trophic changes in the hands are known to occur.

There remained for consideration the so-called vasomotor neuroses, or "angioneuroses." To these conditions our cases presented certain similarities. Of the more familiar of them, however, Raynaud's phenomena are characteristically paroxysmal, bilateral, and induced by cold; while erythromelalgia—first described by Weir Mitchell in a sailor—has a disputed pathology in which it is perhaps possible that psychogenic sometimes plays a part. It is said to occur more commonly in the feet than in the hands, and pain is a more prominent feature.

feature than it was in our cases. The onset following trauma, the marked sensory and motor loss, and the readily demonstrated hysterical motivation (see below) served further to distinguish our group. There is a possibility that hysteria is too seldom considered in the differential diagnosis of vasomotor disturbances. In a recent discussion at the Royal Society of Medicine on "Immersion Injuries and Vasomotor Disorders of the Limbs in Wartime" (*Proc. roy. Soc. Med.*, 1943) no mention was made of psychogenic disorders such as those described here.

## 2. Response to Treatment

In all the cases improvement had ceased with physical methods of treatment employed alone.

*Case 1.*—Relatively little time elapsed between the removal of the plaster and the diagnosis of hysterical paralysis. Psychotherapy of a very simple kind, combined with active exercises, resulted in complete recovery in three weeks.

*Case 2.*—The hand was immobilized for five weeks (there was no fracture); symptoms persisted, but the diagnosis of hysteria was not made until seven months later. Psychotherapy was then begun, and recovery followed in one month.

*Case 3.*—The diagnosis of hysteria was made nine months after the injury. Recovery followed after five weeks of psychotherapy.

*Case 4.*—Here the injury was slight and immobilization was not required. The symptoms were severe. The diagnosis was made nine months afterwards, but psychological treatment for one week enabled the patient to write with his deformed hand for the first time for five years, and he was discharged to duty in 2½ weeks.

*Case 5.*—The diagnosis was made seven months after the injury. Complete recovery was obtained after a fortnight's psychotherapy.

*Case 6.*—The diagnosis was made six months after the injury. Complete recovery, apart from a very slight organic residuum, was obtained after one month's psychotherapy.

The basis of treatment was to obtain the patient's confidence and co-operation. The formal psychotherapeutic procedures comprised explanation, persuasion, and suggestion. Re-education and physiotherapy were given at the same time, with certain precautions; the physiotherapist was instructed to "make the patient do all the work," not to discuss the symptoms, and not to use any form of passive treatment, particularly faradic baths, which had been found always to make the symptoms worse. Occupational therapy was arranged to suit the interests of the individual—e.g., in Case 2 boxing was prescribed.

Most of these patients made rapid progress up to a certain point and then "hung fire." At this point they had to be driven hard, and sometimes were subjected to a restriction of their privileges. In all cases these measures were successful, although in Case 6 a threat of transfer to a disciplinary rehabilitation centre was required. In this case, also, continuous traction by means of elastic and plaster-of-Paris was needed to reduce the secondary contracture. Later the normal hand was immobilized for a short time in order to encourage the patient to use the affected one. It was found useful to obtain, for a three-cornered discussion, the voluntary co-operation of one of the group who was improving satisfactorily with one who was lagging behind.

## 3. Motivation

The Committee on Head Injuries of the Medical Research Council (1941) has defined hysteria as "a condition in which mental and physical symptoms, not of organic origin, are produced and maintained by motives never fully conscious, directed at some real or fancied gain to be derived from these symptoms." While the mere absence of a physical basis for complaints is insufficient, and the demonstration of an adequate personal motive is one of the most important of the positive criteria for a diagnosis of hysteria, it need hardly be pointed out that many a severely wounded or physically ill man has as good reason as the suspected neurotic to wish to avoid returning to the dangers and discomforts of active warfare. The discovery of a motive, such as the wish to be invalided from the Service, is by no means pathognomonic of hysteria; the demonstration of previous neurotic traits, of excessive dependency and emotional immaturity, of underlying anxiety, of a "neurotic" attitude towards symptoms or treatment, and of other neurotic features in the personality may provide helpful confirmatory evidence. In none of the cases under

discussion was the motivation in the least obscure. If it is objected that a more prolonged inquiry would have revealed other important psychopathological material, our answer must be that psychotherapy based upon data elicited by the routine methods of psychiatric history-taking and examination enabled all six men to return to duty in a reasonably short time with some insight and with a will to carry on.

*Case 1.*—This man was a simple, stable Scotsman whose personality and past history were free from psychopathic features. After his first injury, movements of the elbow-joint had been very painful, and he had avoided using it so far as was possible, although, since he was back at duty, a good deal of pain was inevitable. The second injury, which resulted in the detachment of the common extensor origin, occurred before movement of the elbow had become painless and before he had regained confidence in it. This injury caused movements to become still more painful, and the hysterical prolongation of the immobilization by plaster was motivated by fear of renewing the pain. He accepted this explanation; he had no wish to leave the Navy, and, once he had been shown that movements were in fact no longer painful, he worked hard to become fit for duty.

*Case 2.*—This patient had experienced prolonged and severe stress in Russian and Malta convoys, including the torpedoing of his ship. His special duties as a member of the crew of an A.A. gun entailed much use of his left hand. He was worried about the safety of his wife, who was living in a target area, and he frankly said: "I think I have done my bit for this war." Three years previously, as the result of an injury to the same hand, he had been given four months' shore service and missed his ship. The second injury was taken more seriously; the hand was put in plaster for five weeks. It was not surprising, in view of the long strain and repeated enemy actions to which he had been subjected and the concession he had gained before from an apparently less serious injury, that the second injury should have been used hysterically to postpone his return to sea. The personality was extroverted and sound.

*Case 3.*—This man's parents had both had neurotic breakdowns, but he himself had shown no evidence of instability, although slightly backward at school. He had been a farm worker and was keen to go back to the land. After twice breaking his wrist, with an interval of fifteen months during which he was at duty, he developed a hysterical prolongation of the second injury, motivated by his desire to be invalided from the Navy. This desire was reinforced by the knowledge that since he had enlisted his job had been made "reserved." His co-operation was obtained, and he accepted his obligation to serve until the end of the war.

*Case 4.*—In this case a congenital deformity of the hand, of which he had always been rather ashamed, acted as a locus minoris resistentiae following a slight injury which occurred during a period of extreme emotional tension and danger. When he was drafted ashore on account of the ensuing disability the persistent anxiety was transferred to his new work—the responsible duty of servicing an unfamiliar type of aircraft. For him a hysterical disability provided a respite from danger and from responsibilities which had provoked a mild but persistent affective disturbance in a vulnerable personality.

*Case 5.*—This man was a long-standing neurotic. He had been a bed-wetter and had had nightmares up to the age of 11 years. He was a chronic head-biter. At home he had often been in minor trouble: "I always preferred to go my own way." His work record was satisfactory, but he had fainted once while at work, and was kept in hospital for three weeks afterwards. He was prone to headaches and attacks of "tightness" in the chest associated with much belching; these symptoms were worse on exertion, but not related to food. He developed marked anxiety symptoms almost immediately after joining his ship, and had therefore to be drafted ashore. Here he worked well enough until he met with an accident, in which his right ulna was fractured. He was a man with a defective health-conscience, in whom hysterical prolongation, as a means of avoiding the anxieties and discomforts of active service, could probably have been predicted soon after he sustained his injury.

*Case 6.*—This man received a nerve injury during a most dangerous action. He had never been to sea before, but had worked satisfactorily in hospital as a sick-berth attendant. This alarming "baptism of fire," coupled with several superficial shrapnel wounds and a temporary ulnar palsy, made him wish to gain an honourable discharge from the Navy. He felt that he had earned this, and he acquired an exact knowledge of the symptomatology of ulnar nerve lesions. He showed the complacency, the power of self-deception, and the logical inconsistencies which are characteristic of the hysterical personality. He had worked in a bank, and although he felt unable to do any kind of work in the Service owing to his disabled right hand (his writing hand), he believed that he could carry out his duties without too much difficulty if he were allowed to return to the bank. As he said, "My manager has only one arm!"

### The Influence of Personality on Prognosis

Two further cases will be briefly described in which psychopathic defects in the personality adversely affected the prognosis. In neither had there been any injury, but the clinical picture did not differ materially from that described above; in both the condition was recurrent. In one case the left hand was affected, in the other the right leg and foot. These two cases were admitted in 1940 and 1942 respectively.

**Case 7 (Ordinary Seaman, aged 29).**—This man came of a Naval family. His father was a Royal Marine pensioner and all his seven brothers were in the Navy. His mother had had several attacks of hysterical paralysis of the hand. He was brought up to join the Navy; no alternative was ever considered. He first joined in 1926, at the age of 15. He disliked the life from the beginning and never settled down, but the family tradition prevented his seeking his discharge. In 1930 his left hand, in the course of a few days, became swollen, painful, and weak. After nineteen weeks in hospital without improvement he was invalided from the Service. He was ostracized by his family and made unwelcome at home. Six months later, his hand having fully recovered, he rejoined in order to be accepted once more by his father and brothers. He concealed his previous invaliding for a time, but after a few weeks it was discovered and he was discharged as a fraudulent entry. Again he was disowned, but a transient recurrence of swelling, pain, and weakness of the left hand three or four times each year prevented his attempting to join the Navy again. He married, and for the next ten years, with his recurring disability as a face-saver, he was able to lead a restricted and lonely life, making no friends and cut off from his family. In Aug., 1940, he rejoined the Navy, but again found that he could not adapt himself to the life, and early in November his left hand became swollen, painful, cyanosed, and weak. He was admitted to hospital with the provisional diagnosis of "subacute rheumatism." Temperature, pulse, sedimentation rate, and radiographs of the hand were normal; there was no cervical rib. Physiotherapy, salicylates, and colchicum brought no improvement, and, in view of the long history and inadequate personality, psychotherapy was not attempted. He showed a marked emotional immaturity and dependency, being still strongly attached to his family, had a violent temper, and had frequently "fainted" at the sight of blood or on experiencing trivial pain. He was invalided as a case of hysteria.

**Case 8 (Ordinary Seaman, aged 36).**—This man's father was invalided from the Navy after the last war for neurasthenia. He was an anxious, depressive, ineffectual person with vague aspirations to become a teacher, although he took no steps to attain this end. He had for the past ten years earned three guineas a week as a pepper-grinder. In 1938, at a time when he was in financial difficulties which culminated in bankruptcy, his right leg "suddenly gave way" as he was rising from his chair, and he fell to the ground. He could move the leg, but it would not bear his weight. He did not see a doctor, but remained in bed for one month. He then began to get about, but complained of cramp-like pains in the calf if he walked above half a mile or if he climbed more than a few stairs. The pain would disappear after he had rested for some quarter of an hour, but the leg remained weak. Meanwhile, as he felt unable to go out, his wife attended to the bankruptcy proceedings, and for the time being relieved him of all responsibility. After a few months his leg ceased to give him any trouble, although he noticed that it had become, and remained, a little "thinner" than the left.

When he joined the Navy in Sept., 1941, he attempted to gain rapid promotion to petty officer by taking a trade test in engineering. He failed in the test and was bitterly disappointed at having to revert to "menial" tasks and less comfortable living conditions. His right leg again gave way, but recovered when he was drafted to another establishment to await a refresher course before attempting the test again. He felt, however, that he would not be successful. He obtained week-end leave, and his leg gave way once more as he left the train after completing his journey home. He was taken to his house and put to bed. Thence, in Jan., 1942, he was moved to a civilian hospital, where a diagnosis of thrombo-angitis obliterans was made and intensive physiotherapy was given without improvement. In March he was transferred to a Naval hospital; here the condition was considered by the medical specialist to be hysterical, and he was transferred to this unit.

On examination there was wasting to the extent of 1½ in. in the right thigh and 1 in. in the right calf. There was extreme weakness of the leg, and he walked with impressive difficulty on two crutches, which he was persuaded reluctantly to abandon. The foot was cold and blue, and trophic changes were beginning in the skin. No sensory changes were found, although inconstant areas of diminished sensibility had been recorded previously. There were no signs of organic disease to the C.N.S., and in both feet the dorsalis pedis

artery pulsed normally. The C.S.F. was normal, the Wassermann reaction was negative in the blood, and there was no evidence of arteriosclerosis. The left leg and foot were normal.

Here again, in view of the psychopathic setting and the probability of relapse, psychotherapy within the Service was considered unlikely to be effective or worth while. He was invalided as a case of hysteria and was offered further treatment in an E.M.S. neurosis centre. He preferred, however, to return home, as he felt that he would "pick up" quicker there and be able to earn his living sooner.

### Conclusions and Summary

A group of cases is described in which physical symptoms and signs of a distinctive character, hysterically produced or maintained, served greatly to prolong convalescence in six Naval ratings who had received injuries to the hand or arm. The importance of the early recognition of such psychogenic complications is shown by the rapid response to psychological treatment of a relatively simple kind, which was followed in all six cases by return to duty. The diagnostic criteria are discussed under three headings: (1) the physical findings; (2) the failure of physical methods alone and the good response to psychotherapy; (3) the demonstration, by the routine procedure of psychiatric history-taking and examination, of hysterical motivation. It is possible that psychogenic factors are sometimes overlooked in the differential diagnosis of vasomotor disorders.

Prognosis depends very largely upon the personality setting in which the hysterical symptoms occur. Two cases are described in which similar physical symptoms developed without previous injury or severe stress. In these patients the personality was markedly psychopathic, and similar illnesses had occurred in civilian life. Both these men were invalided from the Service.

The lay connotations of the term "hysteria" and the social worthlessness of many hysterics have given rise, understandably enough, to adverse moral judgments. These, however, are not justified in all cases of hysteria, and effective treatment, as well as justice, demands that a careful discrimination should be made.

### REFERENCES

- M.R.C. War Memorandum No. 4, 1941. H.M. Stationery Office, London.  
Proc. roy. Soc. Med. (1943). 38, 515.  
Stephenson, G. V., and Cameron, K. (1943). *British Medical Journal*, 2, 603.

## CHRONIC PULMONARY CATARRH IN CHILDHOOD

BY

A. BRIAN TAYLOR, M.D., M.R.C.P.

Assistant Physician, Birmingham United Hospital

The varying manifestations of recurrent non-specific respiratory infection occurring especially in childhood allow of numerous names and diagnoses being given. Chronic pulmonary catarrh represents a very large proportion of these cases, and this term also usefully describes the condition in the majority. Leys (1927) introduced this name, and his monograph dealt fully with the bibliography and history. He found descriptions of numerous chronic or subacute infective pulmonary conditions under various names which could most satisfactorily be grouped together by this term, which describes the clinical state concisely and usefully. This does not seem to have been adequately noticed, and textbooks and the like do not appear to recognize this common and troublesome condition.

During 1942 there attended my asthma clinic at the General Hospital, Birmingham, 63 children under the age of 14. Most were sent up by their doctors with the general diagnosis of asthma, others for investigation of recurrent bronchitis and persistent or recurrent coughs. In only 12 of these cases did it seem that the condition was a true allergic asthma, the criteria being the previous occurrence of infantile eczema, direct relationship between the attacks and foreign proteins, freedom from respiratory symptoms and signs between attacks, greater frequency in summer months, normal lungs ph-

and radiologically, and response to adrenaline and/or ephedrine. The remaining 51 were examples of chronic pulmonary catarrh, their first diagnosis being variously asthma, recurrent bronchitis, recurrent coughs and colds, etc. In a further group of 38 children, also under 14, seen in private practice for similar symptoms, 33 showed evidence of recurrent catarrhal infections of the respiratory passages, only 5 being cases of true allergic asthma.

The problems of true asthma in childhood have recently been dealt with in this *Journal* (Hurst, 1943, etc.) and numerous papers on the question of allergy have been published—e.g., Bray (1930).

While, doubtless, many asthmatics can be classed in the various groups of allergy, so to regard all of them leads to much disappointment. Skin testing may show sensitivity to proteins, but these are usually so varied as to make the knowledge of little value, whereas many others show no positive reactions at all. Chronic pulmonary catarrh appears to be the chief factor in the majority of the more or less non-allergic cases, and of the present group of 101 children 84 had associated underlying respiratory infections. Recurrent colds or upper respiratory catarrhs were followed by generalized pulmonary effects—coughing, tight chest, wheeziness, and more or less "asthma." In other cases persistence of cough was the most troublesome complaint. Most of the children seemed to show an increased susceptibility to respiratory infections, or else had a chronic infection which was lighted up by unduly trivial circumstances such as changes of weather, exposure to cold winds, damp, fog, rain; and all the attacks were more frequent during the winter and early spring months. Cameron (1926) has emphasized this type of "catarrhal child."

An impression has also developed that with the continuance of the war the natural improvement usually occurring in the spring and summer has been delayed or impeded, suggesting an underlying slight degree of hypovitaminosis or fatigue. During the period of heavy air-raiding the use of air-raid shelters was also evidently detrimental. Geographical effects have been noted in the aetiology: the plateau on which Birmingham stands is 450 to 550 feet above sea-level, far inland, and exposed to south-westerly winds, and the soil is largely clay.

### Clinical Features

The clinical picture of the attack varies greatly. In some children it is mild, and is referred to as a bronchial cold with slight pyrexia and cough; in others the asthmatic features are predominant, with laboured wheezy breathing and prolonged difficult expiration. In another group a mild pneumonic attack seems to occur. The duration and termination also vary considerably, though the slowness of resolution and of disappearance of cough is most noticeable. The acute asthma picture often lasts several days and is followed by persistent wheezing and a cough, especially troublesome at night or by exertion with extra respiratory activity. The physical signs during the attack also vary and are not pathognomonic. Prolonged expiration is usual, but rapid shallow breathing is not uncommon. Rales and rhonchi may be heard anywhere, but especially posteriorly, and, significantly, they are almost always bilateral.

Between the attacks the child may be quite well, but one usually finds shallow breathing, poor development of the thorax as evidenced by round shoulders, flattening anteriorly and Harrison's sulcus, and coughing after deep breathing or exertion. Pharyngitis is often present as well, and large infected tonsils and post-nasal catarrh may be seen. These are certainly not always present; and often they have been treated, but without the expected recovery. While it is desirable to remove chronic upper respiratory infection, many parents are disappointed by the failure of such treatment to prevent the recurrent pulmonary attacks.

### X-ray Appearances

Radiographic changes are common. The movements of the diaphragm are usually restricted. In the cases with an asthma tendency the thoracic cage is deformed, the ribs having an upward tendency from the excessive inspiratory efforts. The chest, too, tends to rise on inspiration instead of expanding. The lung roots are unduly heavy, suggesting glandular enlarge-

ment. The striations radiating therefrom are thick and increased, especially to the lower lobes, but often into a zones. The lung parenchyma itself may have a slightly woolly appearance. One of the most important points is the bilateral and symmetrical nature of the changes. During or immediately following an acute exacerbation there may be shadow of pneumonic consolidation in individual parts of the lung and films taken a few weeks later show these to have disappeared.

Bronchograms show normal bronchi. Occasionally bronchiectasis may simulate or complicate chronic pulmonary catarrh but, in the group of cases that this paper is meant to illustrate distortion or dilatation of the bronchi has not been noticed. Bronchography has been carried out on four of the cases in this series and on others, sometimes as part of the routine investigation and at other times when rales have persisted between attacks or when there has been more copious sputum. Clubbing is unusual.

### Diagnosis

A number of cases have been tested with tuberculin, usually by the Mantoux, and the results are not different from what one would expect in their age group. In considering the diagnosis two points arise: first, the question of nomenclature; secondly, the differential diagnosis. Leys (1927) in his exhaustive monograph has reviewed the historical aspect and shown how the term "chronic pulmonary catarrh" usefully describes this common condition, which numerous authorities have seemed to diagnose under fibrosis of the lungs, fibroid lung, recurrent bronchitis, unresolved pneumonia, interstitial pneumonia, chronic bronchopneumonia, peribronchitis, and so on. Few necropsies have been recorded, and though chronic inflammation and fibrosis occur, it seems more desirable to use a clinical appellation rather than a purely pathological term.

Differential diagnosis has to be made from true allergic asthma, which has already been discussed; and also from bronchiectasis and tuberculosis, both of which have in the past been commonly mistaken for chronic pulmonary catarrh. The former is marked by the exudative nature of the symptoms, and the sputum persists and is purulent between the attacks. Bronchography easily decides the presence or not of dilatation, but now that one can correct clinical impressions thereby it is evident that the two conditions produce quite different pictures. Tuberculosis is often suspected, but the course of this disease has usually not the intermittent character, chronicity over years, and marked effect on the rate and quality of breathing. Radiologically the appearances may be similar, but the lesion in tuberculosis is especially in the parenchyma of one lung, whereas the catarrhal lesions affect the bronchi and bronchioles. The tuberculin test will often help to decide the issue if there is doubt, especially in children. Macpherson (1943) has shown the incidence of a positive Mantoux reaction in children, and under the age of 14 years it can be of great value.

True asthma is often difficult to distinguish. During an acute attack the symptoms and signs are the same—whether the result of spasm of the bronchiolar muscles or of oedema and congestion of the bronchiolar mucous membrane. A negative result from skin tests, no history of other allergic manifestations previously or in the parents, the definite relationship to catarrhal conditions of the throat, the slower recovery, persistence of signs between attacks, radiological changes, and lack of response to adrenaline and ephedrine are among the critical features of chronic pulmonary catarrh.

### Treatment

In the acute attack treatment is that of acute bronchitis, asthma, or pneumonia, depending on the predominant features. On the other hand, the important thing is to reduce the frequency of the attacks and to limit the permanent damage that may result. Frequent and prolonged absence from school and increasing pulmonary fibrosis and emphysema may damage the prospects of these children very materially. There is no doubt that climatic measures can give the best results. In peacetime, wintering in Switzerland for several years has proved most satisfactory. There seems to be a tendency to grow out of the condition, or at least the susceptibility to it as



the child reaches adolescence; and if the ill effects can be prevented by avoiding the attacks for some years, much of the danger has gone. Other warm dry climates abroad are available, but economic as well as international difficulties preclude their help. In England the south and south-west coasts are valuable, but many inland districts are also reliable. From Birmingham many parents send their children to school in the Malvern district, and this relieves the majority. Open-air schools of the local authorities are also beneficial, particularly when they are found in sandy, sheltered, and warm situations.

In wartime especially, these measures are largely impracticable. Also, parents at any time are often loath to part with their children in their early years, and especially when they are delicate. For these cases breathing exercises have been found of extreme value. Their use has been increasing steadily in recent years, especially with the greater knowledge of the mechanism and physiology of the respiratory apparatus. Hurst (1927) has clearly described the main points, and the Asthma Research Council (1934) has also helped to popularize them. Livingstone and Gillespie (1935) have published some results which indicate their value.

The principal points required are to correct faulty posture and movement of the thoracic cage, to promote diaphragmatic movement, to increase respiratory excursion and resilience, and to improve expiration. Douthwaite (1930) has also indicated these points. There is no doubt that the disciplinary effect of these regular exercises is in itself of much benefit, and at the same time insistence on nose-breathing can obviate much of the reinfection and recrudescence of infection from the pharynx.

Teaching the exercises to the children may be done in a group, and I have a clinic at the General Hospital under the charge of Mrs. Brown, head of the massage department. This has the advantage of stimulating the team spirit and encouraging regularity, and of initiating new patients. The alternative is treatment individually, or perhaps in pairs. It is then easier to arrange times to avoid school hours, and with some of the more nervous or difficult children better control is obtained. It is essential that the exercises should be done regularly and daily, and regular supervision by the masseuse makes a great difference in keeping them correct and adequate. At my clinic the children attend twice weekly, and the mothers are also taught the exercises so as to make the children do them on the other days. It is essential to continue the treatment for months or years, and most failures or relapses are due to leaving them off too soon or to want of care in doing them regularly and persistently. The results are seen rapidly. The frequency of the acute attacks is reduced; the attacks are shorter; between the attacks the child is better, healthier in general, loses its cough, and becomes less susceptible to catarrhal infections. The condition seems to diminish naturally as the child grows up, but adequate treatment usually relieves it sooner, and so reduces invalidism and loss of schooling; also it obviates most of the permanent ill effects that may follow, such as chronic bronchitis, emphysema, and fibrosis of the lungs.

The general management of the child must also be watched and clothing and exercise be adjusted. Feeding is often difficult, but common-sense management is needed, especially as these patients can often be classed among the "nervous child" group (Cameron, 1929). As Cameron points out the nervous child is particularly prone to catarrhal infections, whether from a lack of immunity due to chronic upper respiratory infection or from weak vasomotor defences. It is always necessary to remember the neuropathic tendency associated with most cases of asthma, recurring pulmonary infections, and the like. It is important, as Hurst has emphasized, that the child should not think he is an invalid.

#### Summary

The term "chronic pulmonary catarrh" describes a clinical syndrome common in children, causing recurrent respiratory "attacks," often suggesting asthma, but associated with inflammatory changes in the lungs. They cause much trouble to the parents and interfere with the child's development.

The symptoms, signs, and x-ray changes are described.

Treatment is most satisfactory by climatic measures, but, at the present time especially, breathing exercises are proving very valuable

and will relieve the majority of cases. It is essential that they should be controlled competently and be continued over a prolonged period.

#### REFERENCES

- Asthma Research Council (1934). *Physica Exercises for Asthma*, London.  
 Bray, G. W. (1930). *Arch. Dis. Childh.*, 5, 237.  
 Cameron, H. C. (1926). *Postgrad. med. J.*, 1, 87.  
 — (1929). *The Nervous Child*, Oxf. Med. Publ., London.  
 Douthwaite, A. H. (1930). *The Treatment of Asthma*, London.  
 Hurst, A. F. (1927). *Guy's Hosp. Rep.*, 77, 87.  
 — (1943). *British Medical Journal*, 1, 403.  
 Leys, D. (1927). *Chronic Pulmonary Catarrh*, London (and personal communication).  
 Livingstone, J. L., and Gillespie, M. (1935). *Lancet*, 2, 705.  
 Macpherson, A. M. C. (1943). *British Medical Journal*, 2, 98.

## SURVEY OF VITAMIN C LEVEL IN WARTIME IN PREGNANT WOMEN

BY

A. ALISON CRAIG, M.D., D.P.H., D.C.H.  
*Assistant Medical Officer of Health, Bristol*

F. J. W. LEWIS, M.B., Ch.B.

AND

DOROTHY WOODMAN, M.D., M.Sc.

(Department of Preventive Medicine, University of Bristol)

The question of vitamin deficiency in wartime is one which is often under discussion. Vitamin C has perhaps excited the most interest because of the lack of fresh fruit and, to some extent, vegetables in present-day diet. Though the clinical symptoms of scurvy, which is the typical manifestation of vitamin C deficiency, may be absent, it is becoming recognized more and more that subclinical deficiency may be present to give rise to other less definite symptoms. The normal requirements of the body in order to prevent scurvy are usually stated to be 25 mg. of vitamin C a day, though Codville *et al.* (1938) believe the real needs of the body to be 100 mg. daily. Glazebrook and Thomson (1942), in their investigation on boys with tonsillitis, found that a supplementary dose of vitamin C to the normal diet reduced the duration of the disease. None of these boys, moreover, developed rheumatism or pneumonia, as did a small percentage of controls not receiving the supplementary dose. It would appear, therefore, that a higher dose than 25 mg. daily would prove beneficial to the maintenance of good health.

During wartime there have been various reports on the degree of saturation with vitamin C. Harris (1942), using the saturation tests described by Harris *et al.* (1935), investigated children in residential homes, elementary-school children, and university students. By comparison with results obtained under pre-war conditions he found that the average saturation curves for April, 1941, were lower than those for 1939. He also found a seasonal variation, the results being low after winter and better after summer. Francis and Wormald (1942) also investigated students. Their results after 9 months of war were not much different from those of a similar group 12 months earlier. After 21 months of war, however, a greater degree of unsaturation was found. More recently, Kohn, Milligan, and Wilkinson (1943) gave a preliminary communication on levels of vitamin A and C in school-children. They found that 72% of the control group were unsaturated, but that in the group which had received supplementary vitamins all were found to be saturated after three months' tests.

#### Present Investigation

It was considered that it might be of interest to examine a group of pregnant women with reference to their degree of saturation with vitamin C under wartime conditions. These women, though receiving certain extra rations—e.g., milk, and in some cases blackcurrant juice—have probably a greater drain on their resources owing to pregnancy. By collaboration with the doctor of an ante-natal clinic it was possible to choose the patients according to their degree of intelligence and power to co-operate. In all, 40 women were tested at monthly intervals on their visit to the clinic. They received a special form in which to record their diet for the week previous to the test, with special reference to fruit and vegetables. It was obviously impossible to control their diet or to take samples for vita-

content, but, in any case, the results on present-day ordinary meals were what was required. Five non-pregnant women were tested each month as controls. The saturation test employed was that described by Pemberton (1940). This test does not reach the same peak as that described by Harris *et al.* (1935). Pemberton, however, obtained comparative results on two groups of boys—one group on a basic diet and the other on a supplemented diet. He was able to show a marked difference between the two groups. Harris's method is definitely better as it covers a slightly longer period, since the last specimen is not passed till 3 or 4 p.m. Owing to transport difficulties it was impossible to arrange for the women to bring back specimens later in the day, hence the decision to use the shorter method. The first specimen of urine was passed at 9 to 9.15 a.m. (Specimen A); a test dose of vitamin C of 70 mg. per stone of body weight was then taken. Urine was again passed at 11.15 a.m., but was discarded; and again at 1 to 1.15 p.m. (Specimen B). This latter one represents the specimen after the test dose. Only a cup of water, as recommended by Pemberton, was allowed to be drunk after the test dose. The urine was collected in special bottles containing a known volume of glacial acetic acid. Vitamin C was estimated in Specimens A and B by the method of Harris and Ray (1935), the dye being standardized each time. The number of monthly investigations varied with the different cases, as some were evacuated before confinement; but an average of five were done on each woman, making over 200 in all. The whole range of the experiment extended from May, 1942, to Feb., 1943, when, owing to unavoidable circumstances, it was impossible to complete the full year.

The results are given in four tables and a graph. Table I depicts the average amount of ascorbic acid excreted by the five controls both before and after the test dose. It also

shows the range for each period. Table II is similar to Table I but relates to the 40 pregnant women. These results are plotted as a graph. Table III gives the average percentage excretion of ascorbic acid per patient for the first 28 weeks of pregnancy and for the remaining period.

TABLE II.—Average Amount of Ascorbic Acid excreted by 40 Pregnant Women

Tests	Dates	Specimen A: Range before Test Dose (mg. per 100 c.c.m.)	Specimen B: Range after Test Dose (mg. per 100 c.c.m.)	Average before Test Dose	Average after Test Dose
10	6/5/42- 2/6/42	0-0.7	0.3- 53.0	0.34	9.44
16	3/6/42- 30/6/42	0-1.2	0- 82.3	0.30	26.9
22	1/7/42- 28/7/42	0-1.04	0.2-123.1	0.27	39.9
21	29/7/42- 25/8/42	0-1.3	0-222.2	0.36	36.0
21	26/8/42- 22/9/42	0-2.1	0.5-214.0	0.81	67.0
14	23/9/42-20/10/42	0-4.0	2-204.6	0.85	55.2
18	21/10/42-17/11/42	0-3.8	15-345.6	1.30	86.5
14	18/11/42-15/12/42	0-1.3	1.2- 86.3	0.57	18.0
13	16/12/42- 12/1/43	0.3-2.1	0.5-118.0	0.86	20.0
12	13/1/43- 9/2/43	0.1-4.7	0.3- 23.6	1.01	6.9

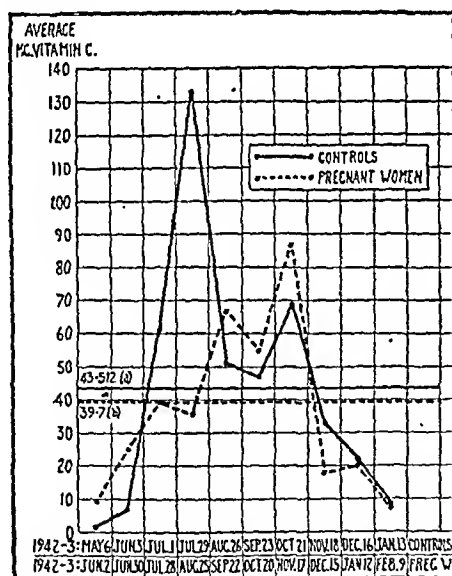
Average after test dose per whole period and whole group = 39.7 mg

TABLE III

Average excretion after test dose during first 28 weeks	.. 36.4 mg.
Average excretion after test dose from 29th week	.. 32.3 mg

TABLE IV

Case	Average Excretion of Ascorbic Acid after Test Dose	Symptoms	Remarks	Infant
1	27.6	Spongy gums	Worse during parturition	Weaned at 3 months because of infantile eczema. Doing well now
2	49.5	" "	" "	Did well
3	52.1	" "	" "	" "
4	43.0	" "	" "	" "
5	2.3	" "	Twins (one died)	Other did well
6	21.5	" "	" "	Did well
7	36.9	Anaemia "	B. coli pyelitis in puerperium; cleared up	" "
8	25.0	" "	" "	" "
9	20.6	" "	" "	" "
10	6.2	" "	" "	" "
11	6.1	" "	" "	Haematemesis 14th day
12	21.5	" "	" "	Transfused; did well
13	16.7	" "	" "	Did well
14	72.0	Slight anaemia	Cornical ulceration at 3 months	" "
15	64.0	Spongy gums and anaemia	Manual removal of placenta	" "
16	19.9	" "	" "	" "
17	8.5	" "	Threatened miscarriage 18th week; settled down	" "



Graph showing comparison between results in controls and those in pregnant women. (a) = Average excretion per test, control group. (b) = Average excretion per test, pregnant women.

TABLE I.—Average Amount of Ascorbic Acid excreted by Controls

Tests	Dates	Specimen A: Range before Test Dose (mg. per 100 c.c.m.)	Specimen B: Range after Test Dose (mg. per 100 c.c.m.)	Average before Test Dose	Average after Test Dose
5	6/5/42- 2/6/42	1-0.8	0.8- 3.6	0.48	1.76
5	3/6/42- 30/6/42	0-0.3	0.7- 20.8	0.10	6.56
5	1/7/42- 28/7/42	0.2-0.3	21.1- 91.8	0.22	61.0
5	29/7/42- 25/8/42	0-6.2	77.3-266.7	1.48	133.3
5	26/8/42- 22/9/42	0-0.5	6.1-135.0	0.22	51.8
5	23/9/42-20/10/42	0-1.0	16.7- 91.5	0.32	47.2
5	21/10/42-17/11/42	0.3-1.5	18.1-157.0	0.88	69.9
5	18/11/42-15/12/42	0.4-0.8	1.8-115.0	0.58	33.1
5	16/12/42- 12/1/43	0.3-1.5	1.4- 89.1	0.96	22.2
3	13/1/43- 9/2/43	0-0.3	0.4- 23.9	0.10	8.3

Average after test dose per whole period and whole group = 43.512 mg.

### Health of Subjects

With regard to the controls, their health with one exception was good throughout save for the usual colds. There was no evidence of anaemia or bleeding gums. The one exception may be worth mentioning as she lived with another of the controls, and therefore had practically the same diet. From May, 1942, to October, their results rose together; but from November to January one of them fell considerably below the other, although still receiving the same diet, and in January she developed influenza followed by bronchitis, and was off work for five weeks. The clinical history of the pregnant women was fully investigated by the clinic doctor. Of the 40 women examined, 3 suffered from both spongy gums and anaemia, 6 others from spongy gums alone, and 8 from anaemia alone. Apart from these symptoms, only the complications associated with pregnancy developed, such as toxæmia and pyelitis, and even these in only a small proportion. This incidence of anaemia—27.5%—is considered by the clinic doctor to be definitely more marked than in pre-war days. With regard to the number of cases of spongy gums, both the clinic doctor and the ante-natal dentist to whom the patients

were sent are of the opinion that the incidence is definitely increased as compared with pre-war days.

The average results on the above 17 pregnant women showing symptoms are recorded in Table IV.

### Discussion of Results

Three main points are shown up by the results. In the first place there is a wide variation in the degree of saturation as judged by the amount of ascorbic acid excreted after the test dose. To economize in space, tables showing each individual excretion are not given, but the variation in the control group lies between 0.4 and 266.7 mg., and in the pregnancy cases between 0 and 345.6 mg. Pemberton (1940) also found variations in his children—namely, 0.5 to 2.6 in those on a basic diet and 13.1 to 74.0 in those on a supplemented diet. One would expect wider variations in our cases, as there was no definite basic diet. Variations occurred from month to month, but where there was a marked rise this appeared to depend on the diet and, incidentally, the season of the year. This leads to the second point—namely, the seasonal variation in both groups. This is well illustrated in the graph. No precise figure for the exact level for saturation following the test dose has been found because, as Harris *et al.* (1935) state, "the test dose does not set out to measure an 'all or nothing' effect—rather, it measures a degree of response or saturation." The average amount excreted per test was worked out for the whole period of the experiment. That for the controls was 43.5 mg., as against 39.7 mg. for the experimental group. Neither of these figures represents a high degree of saturation, and thus it can be assumed that anything below is definitely on the low side. Taking this as our basis, we find in the graph that the real rise towards saturation begins near the end of June for the controls, and near the beginning of August for the pregnancy cases. This rise remains above the average level till November for both groups. The third point of significance is the height of the peak in the two groups. The controls show a much higher peak of 133 mg., as opposed to 86 mg. for the pregnant women.

Most of the investigations on vitamin C in pregnancy have been carried out by workers abroad. The majority show that there is a deficiency in this condition, though Imaz and Gascon (1941) state that, while some change occurred as pregnancy progressed, the limits were found to correspond to normal cases. They conclude that, given an adequate diet, there is no deficiency of vitamin C during pregnancy. Neuweiler in 1935, using the saturation test, found the following range: 8–125 mg. for non-pregnant women, 2–54 mg. during pregnancy, and 2–28 mg. during lactation. He concludes that the utilization of vitamin C is greater in pregnant than in non-pregnant women, and still greater during lactation. Gaehgins and Werner (1937) found a deficiency which was rather more marked in multiparae than in primiparae. Investigating the serum ascorbic acid, Elmy and Christensen (1938) found it was diminished during pregnancy. They also concluded from their investigations that the winter diet from October to April was insufficient as the source of vitamin C—a fact which has been confirmed by our findings. De Rezende (1939–40) and Portnoy and Wilkinson (1938), using Rott's test, found that the tissues of pregnant women were deficient in vitamin C and that this deficiency increased as pregnancy progressed. We have worked out the average excretion per person for the first 28 weeks of pregnancy and the remaining period (Table IV). There is only a small difference between the two, but it suggests a slightly lower saturation in the latter part. The finding that the excretion is lower in pregnant women than in controls thus confirms previous observations. That the latter show an earlier rise is also probably due to this fact, since any diminution during pregnancy would tend to lower not only the peak but the time at which the peak is reached. The explanation for this decrease in saturation was well defined by Teel *et al.* (1938), who, finding that the vitamin in the cord plasma was greater than that in maternal blood, deduced that the foetus acts parasitically on the mother.

Our results appear to indicate that, though at the present time the degree of saturation of both groups is low, there are certain periods during the summer months when it rises and the diet would seem to be more adequate. The increased

incidence of anaemia as suggested by the clinic doctor may not be due to lack of vitamin C only but to other factors. With regard to the spongy gums, it would appear from clinical evidence that more cases are occurring than in pre-war days. The results of our experiments, however, show no definite indication that they are associated with lack of vitamin C. This may play a minor part, but no conclusion can be arrived at from the small number of clinical cases reported by the ante-natal doctor.

### Summary

A group of 40 pregnant women were examined in respect of their degree of saturation with vitamin C under wartime conditions.

Results showed that there is a wide variation in the degree of saturation, and that it is on the low side.

There is a marked seasonal variation, the patients becoming definitely more saturated from June to October.

We would like to express our grateful thanks to the Colston Research Committee for a grant in aid of research expenses, and to Mr. K. G. Moreman for his technical assistance.

### REFERENCES

- Codville, E., Simonnet, H., and Mornand, J. (1938). *Presse méd.*, 46, 1745.  
De Rezende, J. F. (1939–40). *Gynéc. et Obstétr.*, 40, 322.  
Elmy, A., and Christensen, P. B. (1938). *Ugeskr. Læg.*, 100, 1047.  
Francis, G. E. C., and Wormald, A. (1942). *Lancet*, 1, 647.  
Gaehgins, G., and Werner, E. (1937). *Klin. Wschr.*, 16, 843.  
Glazebrook, A. J., and Thomson, S. (1942). *J. Hyg., Camb.*, 42, 1.  
Harris, L. J. (1942). *Lancet*, 1, 642.  
—, Abbey, M. A., Ray, S. N., and Marrack, J. R. (1935). *Ibid.*, 2, 1393.  
—, and Ray, S. N. (1935). *Ibid.*, 1, 71.  
Imaz, F. A. U., and Gascon, A. (1941). *Sem. méd.*, B. Aires, 2, 355.  
Kohn, G., Milligan, E. H. M., and Wilkinson, J. F. (1943). *British Medical Journal*, 2, 477.  
Neuweiler, W. (1935). *Klin. Wschr.*, 14, 1793.  
Pemberton, J. (1940). *British Medical Journal*, 2, 217.  
Portnoy, B., and Wilkinson, J. F. (1938). *Ibid.*, 1, 323.  
Teel, H. M., Burke, B. S., and Draper, R. (1938). *Amer. J. Dis. Child.*, 55, 1004.

## SUDDEN DEATH IN LABOUR

BY

R. G. COOKE, M.D., D.R.C.O.G.  
Medical Superintendent, City Hospital, Derby

The following is an account of sudden death occurring during normal labour in an apparently healthy young primipara, in whom a congenitally small aorta and a persistent thymus gland were found to be present post mortem.

### Case History

Mrs. A. B., aged 22; primipara; well-developed muscular woman. No history of any illness. Had attended ante-natal clinic regularly and appeared to be a normal case. On June 2, 1943, at 9.30 p.m. pains started, and at 11.45 p.m. she was admitted to hospital. Term. R.O.A. Blood pressure 136/90. No albumin in urine. General condition good. Strong pains every 15 minutes. Foetal heart normal.

June 3, 1943.—1.30 a.m.: Three fingers dilated; membranes intact. 2 a.m.: Half an ounce of routine sedative mixture given; general condition good; foetal heart normal. 3 a.m.: Membranes ruptured; fully dilated. 3.5 a.m.: Patient became unconscious, cyanosed; breathing stertorous, limbs flaccid; strong pains every one or two minutes. 3.20 a.m.: Pulse rapid and weak; not so deeply unconscious; reflexes present; arms rigid; legs flaccid; diffuse macular rash on trunk and limbs. 3.25 a.m.: Child born—stillborn. 3.40 a.m.: Placenta expelled; normal loss; ergometrine 1 c.cm.: condition of patient poor but uterus well contracted; warmth; intravenous plasma; oxygen. 4 a.m.: Patient recovered slightly; semi-conscious, muttering, and restless. 4.30 a.m.: Patient deeply unconscious again; pulse weak and thready; condition very poor. 5 a.m.: Condition becoming hopeless; acutely restless; pupils dilated and fixed. 5.45 a.m.: Death.

*Post-mortem Report.*—Heart normal size. Right side relatively empty; this was opened *in situ* and found to contain about six air bubbles, but the blood was not frothy and no bubbles were in the pulmonary artery. Multiple subendocardial haemorrhages in the left ventricle. Valves normal. The aorta was notably small in diameter, measuring only 34 mm. in circumference. Other blood vessels normal. The thymus persisted. Upper air passages clear. The pleura and lungs were perfectly normal, with no trace of pulmonary oedema. The thyroid was slightly enlarged and showed some nodules. Lymph glands not appreciably enlarged. There was ascites of 2 to 3 pints; the fluid was straw-coloured and slightly blood-stained; the peritoneum was otherwise normal. The stomach

bowels were normal except for the distension of the latter with gas. The liver was of normal size, but notably pale. Gall-bladder was normal, and filled with very pale bile. The spleen was twice the normal size, and was red and soft. The suprarenals and pancreas appeared normal. Kidneys normal except for some dilatation of the right pelvis and ureter. Bladder normal. Uterus recently delivered; placenta had been attached at fundus posteriorly; well contracted, normal, no tears of cervix. Bruising of vagina. Tubes and ovaries normal. Skull, meninges, and brain all normal; no cerebral oedema, etc.

**Section Reports.**—The thyroid shows patchy epithelial hyperplasia and increase in stroma, but no appreciable lymphocytic infiltration. The thymus (see Fig.) has typical Hassall's corpuscles. There is

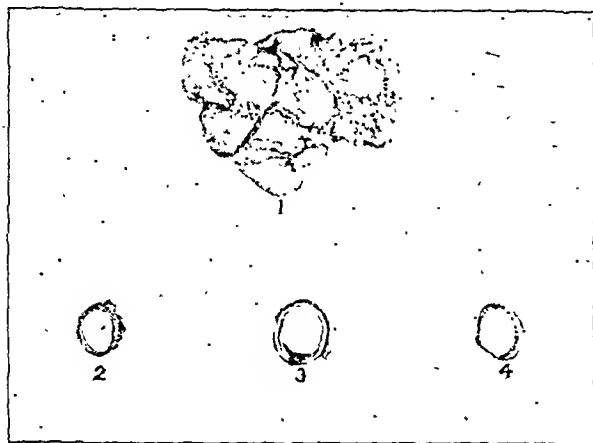


Illustration showing (1) the persistent thymus gland; (2) small aorta from patient (circumference 34 mm.), with, for comparison, (3) normal aorta from adult (circumference 51 mm.) and (4) normal aorta from boy aged 12 (circumference 41 mm.).

hypertrophy of the pituitary, with many basophilic cells. The heart muscle appears normal. The liver shows an extensive tendency to necrosis in the central and intermediate zones, but this is in an early stage. The kidney shows some swelling and early necrosis of the convoluted tubules, and a fairly extensive deposition of brownish pigment in the collecting tubules especially. The pigment does not give an iron reaction. The uterus shows hypertrophy of pregnancy and some decidua; no inflammatory changes.

Death was apparently due to shock. The persistent thymus, small aorta, and nodular goitre evidently gave her a morbid predisposition to shock. The shock was apparently the result of a very rapid birth—the whole labour taking only about six hours instead of the usual 18 to 24 hours in a primipara. The aorta was very small, the circumference being only 34 mm. (see Fig.). The normal circumference for an adult female is about 51 mm., and the normal circumference for a boy aged 12 is about 40 mm. The circumference was measured at the level of the sixth thoracic vertebra.

The patient had had a sister who had died suddenly at the age of 9 while playing. There was no injury. It was on the occasion of a special Sunday-school event, and she was excited. Necropsy and inquest: death due to status lymphaticus.

#### Discussion

The association of a small aorta with a persistent thymus is evidently a matter of importance. Millar and Ross (1942) measured the aorta in many cases of death from accident and disease: the circumference was smaller in those dying from accident, though not grossly so. They consider that a narrow aorta is evidently able to provide for the ordinary needs of the body, but may be unable to cope with sudden emergencies, and may lead to accidental death. In considering the syndrome of status lymphaticus—persistent thymus, enlarged lymphoid tissue, poor development of the arterial system, especially in aorta calibre—they are of the opinion that developmental arterial hypoplasia is the most reliable guide. Moon (1942) says: "A small percentage of human beings have a group of associated anatomical features—hyperplasia of lymphoid tissue, hypoplasia of heart and arteries, etc. A few individuals are liable to die unexpectedly from trivial and inadequate causes: such cases occur almost exclusively among the anatomical group described." Temple Grey (1937), in discussing causes of sudden

death, mentions cases occurring in energetic young adults in whom the heart and aorta are small for the size of the body and in whom some thymus tissue usually persists.

German authors Kehrer and Romberg (1936) think a persistent thymus may precipitate death in obstetrical complications, and quote cases of placenta praevia, renal lesions, haemorrhage, anaemia, and version. Kehrer quotes a case in which sudden death occurred during a version, and the patient was found to have pronounced status lymphaticus with a greatly narrowed aorta. Romberg considers that the process of labour alone may be responsible for sudden death in such a patient.

A further case also occurred at this hospital about a week after the one described above. A 3-para aged 22—an unbooked maternity case—was sent in with a severe post-partum haemorrhage. She was dead on arrival, and at the necropsy a persistent thymus and a small aorta were present.

#### Summary

A case is described in which sudden death occurred in labour in an apparently healthy woman.

At necropsy a very small aorta was found to be present along with other signs of status lymphaticus.

A similar case in normal labour is not traceable in the literature on an ordinary search, although the condition does not appear to be unduly rare.

The small aorta will render the patient more liable to peripheral circulatory failure, especially if some shock-producing condition is present—e.g., rapid labour.

It is suggested that this condition may be a contributory factor in uninvestigated deaths occurring during abnormal labour and may also be responsible for some of the unexplained deaths in normal labour which are not fully investigated.

I am obliged to Dr. G. R. Osborn for the pathological reports, to Dr. R. J. O. Taylor for assistance with the translations, and to Sergt. Fayers for the photographs.

#### REFERENCES

- Grey, F. Temple (1937). *Post-grad. med. J.*, 13, 16.  
Kehrer and Romberg (1936). *Archiv. Geburtsh. Gynäk.*, Berlin.  
Millar, W. G., and Ross, T. F. (1942). *J. Path. Bact.*, 54, 455.  
Moon, V. H. (1942). *Shock*, Philadelphia.

## Medical Memoranda

### Amoebic Abscess of Spleen

Amoebic abscess of the spleen is very rare, and when it does occur is usually associated with amoebic hepatitis. In this case there was no clinical evidence of liver involvement.

#### CASE RECORD

On April 1, 1943, an Indian girl aged 12 was brought for examination. She gave a history of pain in the left lumbar region of 30 days' duration and swelling in the same region for 21 days. She had no urinary symptoms and passed a normal stool once each day. She had been under observation elsewhere for 15 days, and during this time had had a temperature ranging between 99° and 104° F. Her pulse rate had varied between 90 and 110. Quinine and sulph-anilamide had both been given without effect.

The child had obviously lost weight. Her pulse was 110 and temperature 103° F. The heart and the respiratory system showed no abnormality. On abdominal examination her spleen was found to extend downwards and forwards to below the level of the umbilicus, and was extremely tender. The liver was neither enlarged nor tender. The haemoglobin percentage was 60, the red blood count 3,400,000, and the white blood count 13,400—neutrophil polymorphs 80%, lymphocytes 18%, and large mononuclears 2%. The morphs showed no abnormality. A provisional diagnosis of amoebic splenitis was made, and a course of emetine, gr. 1/2 daily for 10 days, was begun.

On the following day, April 2, cysts of *Entamoeba histolytica* were found in her stools. On April 5 her temperature reached 103° F. and a fluctuating swelling had developed below the left costal margin and over the spleen. From this, 40 c.cm. of pus was aspirated. The pus was similar to that from an amoebic abscess of the liver, was sterile on culture, and no organisms were found in smears. No *E. histolytica* were seen in it. After this aspiration her temperature never rose above 98.8° F. On April 9, 10 c.cm. of typical amoebic pus was aspirated. On May 5 the patient was free from pain, her spleen was not palpable, and she had no disability.

J. R. FRANK, F.R.C.S.Ed.  
Capt., R.A.M.C.

## Reviews

### FRACTURES AND JOINT INJURIES

*Fractures and Joint Injuries*. By R. Watson-Jones, M.Ch.Orth., F.R.C.S. Volume 11, third edition. (Pp. 550; illustrated. 75s. per set of 2 volumes, plus 1s. postage.) Edinburgh: E. and S. Livingstone, 1943.

The third edition of this work has of necessity been divided into two volumes, of which the first dealt with the general principles of treatment while the present volume deals with the various fractures and injuries in detail. The high standard of the first volume is fully maintained and the second is of even greater interest than its predecessor. It establishes a new standard in precise description and apt illustration, both of the injuries and of the methods by which they can be corrected. Scarcely a statement is made without an apt illustration, either photographic or diagrammatic, to clarify its meaning. The subject is, in fact, treated in such detail that the book is exceedingly difficult to review, and we can only recommend those who are interested in fractures to read it for themselves. As an example we might refer to the first chapter on injuries to the shoulder and to the short section on rupture of the supraspinatus tendon. Nothing could be more effective than the description of its causation, the diagrams of the lesion itself, and the precise description of the author's own technique for its relief. Injuries around the elbow, which are so common and so often the source of trouble to the surgeon, are discussed with equal lucidity, and our only fear is that the young surgeon may scarcely appreciate the immense difficulties which would seem to be so easily resolved. But perhaps the high light of the book is in the treatment of fractures of the neck of the femur by the modern nailing operation, where the method is described so precisely that it would seem difficult to make any mistake.

The whole book is profusely illustrated, often with great ingenuity, and we would again express our appreciation of the flaps which conceal key diagrams until the reader has been deceived by an apparently perfect x-ray photograph. The author deserves congratulation on a brilliant achievement in a work of use not only to the expert but to all who may ever have to treat a fracture.

### THE TANGLE OF OCCUPIED EUROPE

*Occupied Europe, German Exploitation and Its Post-War Consequences*. (Pp. 75, 1s. 6d.) London: Royal Institute of International Affairs, Chatham House, St. James's Square, London, S.W.1.

This booklet describes Germany's mobilization and exploitation of the resources of occupied Europe up to the autumn of 1943, and some of the problems to be faced during and after liberation. Within the occupied and satellite countries independent economic life has ceased to exist; all has been harnessed to the German war machine. The methods adopted and the results achieved in this nefarious undertaking in the various occupied countries are succinctly outlined. This enables the reader to gain some insight into the immensity and complexity of the problems that will face the United Nations when the overthrow of Germany has been secured. Should the release of occupied countries be gradual in the wake of advancing Allied armies the devastation of battle-grounds added to present scarcity will enhance the difficulties and urgency of relief. Should there be a simultaneous release of all occupied territory following a German collapse, the need for widespread relief and rehabilitation will present formidably complicated problems. The movement of millions of persons—war refugees, foreign workers who have been conscripted for slave labour in Germany, and prisoners of war—all anxious to return home at the earliest moment, will have to be controlled. Such control is important not least from the public health point of view. The organization and co-ordination of health services will be an urgent necessity.

A section of the booklet describes the setting up of U.N.R.R.A., its organization and functions. The task of unravelling the tangle of occupied Europe promises to be one of the most stupendous tasks to which mankind has ever set its hand.

### CONSERVATIVE TREATMENT OF PYORRHOEA

*Textbook of Periodontia (Oral Medicine)*. By Samuel Charles Miller, D.D.S., F.A.C.D. Second edition. (Pp. 733; illustrated. 50s.) London: Henry Kimpton, 1943.

This is an American book about the conservative treatment of pyorrhoea. That this aspect of dentistry is considered to be of the greatest importance at the New York University College of Dentistry is shown by the fact that the textbook is written by an associate professor of periodontia with the co-operation of four assistant professors, seven instructors, and fifteen special contributors, and that it runs into over 700 pages. The contributors presume that almost any case of pyorrhoea is suitable for treatment even when the teeth are loose. That they have evolved a most elaborate technique and are full of enthusiasm for the results they have obtained is beyond question: they are indeed fortunate in having so many persevering and conscientious patients. The operation of gingivectomy, which is the basis of the conservative treatment of pyorrhoea, is performed all over the world with varying degrees of success. The details of this procedure are well described and must stimulate British dental surgeons to careful consideration of their own techniques. The cure depends so much on the post-operative routine of dental hygiene that many of the disappointing cases seen in this country are the result of the patient himself not appreciating the part that he has to play to obtain a lasting result. The American does seem to understand this better than we do, and the chapters on this subject are helpful. Much is said about the medical aspect of pyorrhoea from the aetiological point of view and as a basis of treatment, but too little stress is laid on the importance of the mouth as a focus of infection. Periodontal disease can be the cause of much ill-health and serious illness, and conservative treatment of it is no guarantee that the infection has been eliminated.

### Notes on Books

SIR IAN FRASER, M.P., has added another to his great services on behalf of his fellow-blinded by compiling a pamphlet published for the British Council (Sir Isaac Pitman and Sons, Ltd.; 1s.) entitled *Learning to be Blind*. Briefly it describes the experience of three great institutions—St. Dunstan's, the National Institute for the Blind, and the National Library for the Blind. In a series of cheerful pictures it illustrates the many callings open to blind men and women, the sports and games they can enjoy, and the approximation to normal social life which they can achieve. The approximation is so close that in many of the pictures the photographer has evidently had difficulty in indicating that the people shown are blind at all. It is mentioned that at the present time nearly 250 blind masseurs and masseuses are actively engaged in their profession. One drawback was that they could not administer electrotherapy because of their inability to read the instrument showing the passing of the current; but a simple clamping device has now made it possible for the blind operator to feel the needle of the instrument without damaging it, and now all blind masseurs and masseuses are trained to undertake electrotherapeutic work under medical supervision.

The South Travancore Medical Mission (London Missionary Society), situated in the extreme "toe" of India, has had 19 medical missionaries since its work began just over a hundred years ago, six of them Fellows of the Royal College of Surgeons of Edinburgh and nine others Edinburgh graduates. None of them shows as long a record of service as the present chief of the medical staff, Mr. T. HOWARD SOMERVELL, F.R.C.S., who joined the Neyoor Hospital over twenty years ago. In the report of the Mission, carrying the story to May of last year, Mr. Somervell writes about his long experience. He has pursued the policy of cutting down the numbers of dispensaries and small branch hospitals and of concentrating on institutions larger and well equipped and situated in places of convenient access. Although the Mission now has only half the number of branches that it had in 1923 it has three times the number of hospital beds, and the chief hospital at Neyoor has every facility for modern treatment except deep x-ray therapy. The report also contains the first impressions of the newest recruit, Dr. N. E. James, who writes that the advanced state of some of the diseases in India has to be seen to be believed. The first case of cholera he ever saw reminded him of "an air-raid casualty without any wounds."

The *Presse Médicale* of Paris recently celebrated the 50th anniversary of its foundation on Dec. 23, 1843.



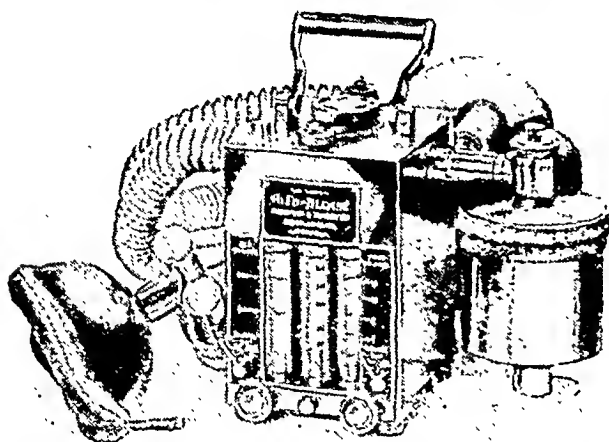
## Preparations and Appliances

### AN ALL-PURPOSE ANAESTHETIC MACHINE

Dr. ERNEST I. BIEBER, honorary anaesthetist, Chester Royal Infirmary, writes:

It has always been difficult to obtain an all-purpose anaesthetic apparatus that is both efficient and extremely portable. Alexander and Fowler, Ltd., of Liverpool have produced an apparatus which fulfils most excellently all the requirements of modern anaesthesia. The illustration shows the head only, but the complete outfits comprise both portable and theatre stands.

It consists of a rectangular metal box, 6½ in. deep × 5 in. × 4½ in. Three small rotameters are contained in a recess in the



ALEXANDER &  
FOWLER LTD

front of the box; they are calibrated for oxygen, cyclopropane, and nitrous oxide. Fine-adjustment valves which operate them are mounted on a panel directly below. Two small levers on either side of this panel control by-passes and provide a means of increasing the flow of  $O_2$  and  $N_2O$ . A push-button on top of the machine enables full oxygen to be given in an emergency without the necessity for altering the fine-adjustment valves. The ether control valve and a three-way tap are placed on top of the box; this tap enables the gases as they issue from the rotameters to be passed either direct to the facepiece, over the surface, or actually bubble through the ether.

The ether container can be replenished or emptied by means of a filler placed behind the ether control valve, while an aperture at the back of the box enables the level of the ether to be readily seen. A tapered mount to which is fitted a soda-lime canister, an adjustable air port, and a half-gallon rebreathing bag fit directly to the right-hand side of the box. The canister, which is provided with a combined expiratory valve and an absorber by-pass, is fitted with perforated diaphragms to ensure even distribution of the exhalations through the soda lime.

The wide-bore rebreathing tubes, afferent and efferent, come from the left side of the machine and are adapted to an "E" piece which carries the mask. Inside this "E" piece are two non-return valves which control the direction of the respiratory tide. A third small-bore tube runs from the machine with the respiratory tubes; fresh gases are conducted directly to the mask by it. The design of the valves ensures a minimum obstruction to the respiratory tide, their position at the face-piece reducing dead space to the minimum, and ensuring more perfect absorption of  $CO_2$ .

If ether vapour is required, the control valve on top of the box enables any fraction of the warm exhaled gases coming from the absorber via the rebreathing bag to be passed over the evaporating surfaces placed in the ether container. The ether valve is constructed to allow vapour concentration to be increased so gradually that no interruption of the respiratory rhythm occurs.

During administration atmospheric air to any amount can be added to the circuit by means of a single ball bellows which can be plugged into the aperture on the right-hand side of the box. This air port may be used for the introduction of ethyl chloride into the circuit if required as an induction agent. At the end of the administration the combined contents of the bag and circuit can be voided through this port and the patient re-educated to breathe atmospheric air. A vinesthene drip feed may be plugged on between the machine head and the afferent tube if desired.

I have been using this apparatus for the past 18 months and have given every type of anaesthesia with it, from simple

dental anaesthetics to intratracheal anaesthesia with controlled respiration, and have found it most satisfactory in use. The outstanding features in its design and construction are its portability, easy adaptability to various circuits, and simplicity in operation. In addition, it has the advantage that where there is a low-pressure supply of gas and oxygen, as on a theatre trolley, the machine head can be used directly from this.

### APPARATUS FOR UTERO-TUBAL INSUFFLATION

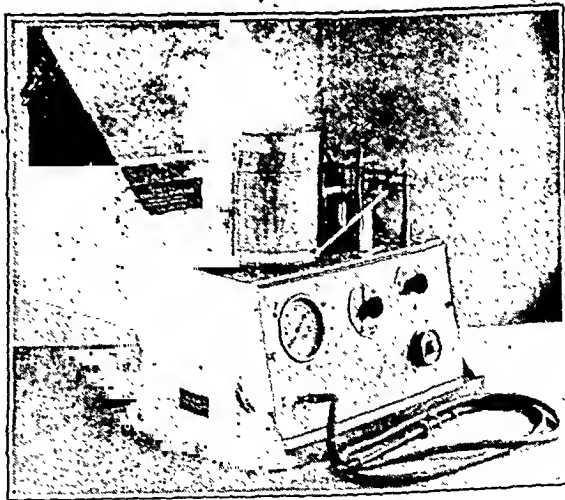
ALBERT SHARMAN, M.D., Ph.D., B.Sc., M.R.C.O.G., Royal Samaritan Hospital for Women, Glasgow, writes:

The use of utero-tubal insufflation with carbon dioxide for the determination of tubal patency or non-patency in cases of sterility—it is both diagnostic and therapeutic—is now universal. Many types of apparatus have been employed since the method was first described by Rubin in 1920. The addition of a kymograph in 1925 enabled Rubin to record the graph of the insufflation: the pattern gave definite evidence, not only of normal tubal patency, function, and non-patency, but also of tubal dysfunction and pathology—e.g., spasm and stenosis. All who have used the kymograph agree that it is a most valuable adjunct.

The apparatus described here is the most recent one manufactured, and it incorporates the main features first devised by Rubin, and subsequently modified by Bonnet.

Carbon dioxide is supplied by a cylinder, enclosed within a metal container. A spare cylinder is also enclosed, allowing for constant use of the instrument while the empty cylinder is being refilled. A reducing valve reduces the pressure of the gas to atmospheric (approximate) when the apparatus is in use. On the front panel of the instrument are mounted (1) the dial of the flow-valve, (2) a pressure gauge indicating the amount of gas in the cylinder and the point at which it requires recharging, (3) the main valve of the  $CO_2$  cylinder, and (4) a close-and-shut valve. The rate of flow of the gas can be accurately regulated by moving an indicator on the dial of the flow-valve till it faces the figure corresponding to the desired rate (anything up to 100 c.cm. per minute).

Above the panel there is fitted a special type of recording manometer which records on a revolving drum, in ink, pressure variations during tubal insufflation. The drum, 9 cm. in diameter and 13 cm. in height, is provided with interchangeable sheets of chart paper; it is driven by a small synchronous motor (alternating current) at about one revolution in five minutes. The recorder charts are marked to read up to a pressure of 250 mm. of mercury, which is the maximum pressure recommended. The Rubin uterine cannula is used with the added Bonnet device for altering the level of the rubber nozzle, whereby the pressure of the latter against the extended cervical os may be increased as desired.



A compartment in the case (which is made of wood) houses the electric plug and flexible lead, the cannula, and its connecting rubber tubing. The chart papers also are enclosed alongside by means of clips. The case is fitted with a carrying handle and with clip-hinges for swinging the top cover back when the apparatus is to be used. The whole apparatus is compact and portable, the overall dimensions of the case being 13½ in. × 12½ in. × 8½ in., and the total weight approximately 22 lb. Each cylinder when full should supply enough  $CO_2$  gas to do not fewer than 200 insufflations.

The apparatus is made by Kelvin, Bottomley, and Baird, Glasgow, S.W.

## BRITISH MEDICAL JOURNAL

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## FLUORINE AND DENTAL CARIES

"Caries has with justice been referred to as the most ruinous of dental maladies, not only in childhood but at every epoch of life. . . . I think it well worth consideration whether the reintroduction into our diet, and especially into the diet of child-bearing women and of children, of a supply of fluorine . . . might not do something to fortify the teeth of the next generation."<sup>1</sup> We are only now beginning to appreciate the truth of this suggestion, made by Sir James Crichton-Browne just over 50 years ago. Modern interest in the connexion between fluorine and the teeth dates from the early 1930's, when it was shown that too much fluorine in the food and drink led to a disfigurement or mottling of the teeth. At the same time, however, experimental evidence was accumulating to show that a certain amount of fluorine might be rather a good thing. Workers in America,<sup>2,3</sup> England,<sup>4,5</sup> and other countries noted that there was less than the average incidence of caries in communities in which mottled enamel was common. The drinking-water is probably our chief source of fluorine, and Dean and his colleagues<sup>6,7,8</sup> have made extensive studies indicating a relation between the amount of fluorine in the water, mottled teeth, and freedom from dental caries. They have shown that this freedom from caries applies to both the temporary and the permanent teeth, and it affects the anterior teeth more than the molars. Furthermore, in an area of endemic fluorosis the caries incidence in teeth that are mottled is the same as in those that are not, indicating that the reduction of caries is not the result of the mottling *per se* but rather of the intake of fluorine.

The optimum concentration of fluorine in the water is thought to be about 1 part per million. Below this level the caries incidence is high. Above 4 p.p.m. there is a danger of a severe degree of mottling with pitting. A very pretty comparison<sup>9</sup> has recently been made of the incidence of caries in North and South Shields. These towns, on opposite sides of the River Tyne, appear to be similar in climatic, social, and economic conditions, but the water supply of North Shields contains less than 0.25 p.p.m. of fluorine, while that of South Shields has a fluorine content of 1.4 p.p.m. The incidence of caries in the permanent teeth in 12-year-old children in North Shields was approximately double the incidence in South Shields.

Fluorine that is ingested while the tooth is being formed is incorporated into the tooth substance, but it seems an

important point that fluorine can protect the teeth from caries even after they are fully calcified. Evidence for this has come from epidemiological studies<sup>10</sup> and from animal experiments,<sup>11</sup> and various attempts have been made to discover the mechanism at work. The enamel of caries-resistant teeth has been reported to contain increased amounts of fluorine.<sup>12</sup> The problem seems to be whether the fluorine reaches the hard tissues of the teeth via the blood stream and pulp, or whether the enamel itself combines with fluorine as it comes in contact with the saliva, the drinking-water, or the food. Rats have generally been used for these investigations. The caries is induced by feeding coarse particles of corn or rice, but rat caries so produced is not entirely analogous to human caries, for the lesions are mainly of the occlusal surfaces. In human caries it is usually the smooth surface of the enamel that is affected. However, dental caries in the rat remains the closest counterpart of human caries that can be brought about in experimental animals, and the caries-producing action of the coarse corn diet is undoubtedly lessened if the diet is supplemented with fluorine. Arnold and McClure<sup>13</sup> studied the effect of giving rats on a coarse corn diet sodium fluoride subcutaneously, and found no reduction in the incidence of caries. Sognnaes<sup>14</sup> tried the local application of potassium fluoride to the teeth of rats on a caries-producing diet, and found that the incidence of caries was half as high as it was in a control group not being treated with fluoride. It cannot be the presence of fluorides in the saliva that explains the effect, however, for rats from which the salivary glands had been removed showed the usual reduction in dental caries when fluorides were given by mouth.<sup>15</sup> Furthermore, very little fluorine is found in the saliva, even after the injection of relatively large amounts intravenously.<sup>16</sup> A preliminary note on the effect of the local application of a solution of sodium fluoride to children's teeth has recently been published.<sup>17</sup> It appeared to reduce the incidence of caries by 30 to 40%.

The conclusion that must be drawn from all this work is that in fully erupted teeth fluorine is adsorbed by the enamel directly from water while it is in the mouth. Evidence that fluorine has a special affinity for tooth substance is forthcoming from other sources. Fluorides have been shown to react with powdered enamel and dentine just as they do with other basic calcium phosphates, and the solubility of the tooth substance in acid is thereby decreased.<sup>18</sup> It appears from the evidence available that fluorine protects the teeth by combining with the enamel, thereby making it more resistant to the products of bacterial action in the mouth. A large-scale human experiment comparing the effect of using a water with 1 p.p.m. of fluorine and a dentifrice containing fluoride merits an extensive trial under well-controlled conditions. The effect of sucking tablets containing fluoride, as suggested by Broderick,<sup>19</sup> should possibly also be included in the

<sup>1</sup> *Lancet*, 1892, 2, 6.<sup>2</sup> McKay, F. S., *J. dent. Res.*, 1927, 8, 353.<sup>3</sup> Black, G. V., *Dent. Cosmos*, 1916, 58, 129.<sup>4</sup> Ainsworth, N. J., *Brit. dent. J.*, 1933, 55, 233.<sup>5</sup> Murray, M. M., and Wilson, D. C., *Lancet*, 1942, 1, 98.<sup>6</sup> *Publ. Hlth. Rep., Wash.*, 1941, 56, 365.<sup>7</sup> *Ibid.*, 1941, 56, 761.<sup>8</sup> *Ibid.*, 1942, 57, 1155.<sup>9</sup> Weaver, R., *Brit. dent. J.*, 1944, 76, 29.<sup>10</sup> Deatherage, C. F., *J. dent. Res.*, 1943, 22, 173.<sup>11</sup> McClure, F. J., *ibid.*, 1943, 22, 37.<sup>12</sup> Armstrong, W. D., and Brekhus, P. J., *ibid.*, 1938, 17, 393.<sup>13</sup> *J. dent. Res.*, 1941, 20, 457.<sup>14</sup> *Brit. dent. J.*, 1941, 70, 433.<sup>15</sup> Cheyne, V. D., *Proc. Soc. exp. Biol., N.Y.*, 1940, 43, 58.<sup>16</sup> Wells, J. H., *J. dent. Res.*, 1940, 19, 555.<sup>17</sup> Bibby, B. G., *ibid.*, 1943, 22, 207.<sup>18</sup> Volker, J. F., *Proc. Soc. exp. Biol., N.Y.*, 1939, 42, 725.<sup>19</sup> Dale, P., *Brit. dent. J.*, 1942, 72, 251.

comparison. Prophylaxis in the future may lie, not in regulating the amount of fluorine in water supplies but in legislating for the compulsory inclusion of specified amounts of fluorine in every dentifrice that is sold.

### IS SECURITY HARMFUL?

The fundamental problem for the welfare of any community is that of getting the best possible from its individual members. What is best is susceptible to a variety of definitions. Different communities have adopted different standards at various periods of their existence. Those who run a competitive individualistic society—or at least some of them—have no doubt of the way to get the best—in the sense of the most—out of an individual in the interests of one of the competing groups within that society. Their aim is to maintain a state of economic insecurity in the common man by preserving a surplus of labour and the correlative power to “sack.” The efficient working of this doctrine depends fundamentally on fear—fear at different levels of individual social integration: fear of starvation, of inability to maintain the home, and of loss of prestige. Is this doctrine biologically sound—that human beings perform best when they are insecure in material ways or, indeed, in any other way? The author of the Beveridge report, for example, evidently thinks not. The question is a fundamental one: for the reorganization of society as well as for determining the useful limit of schemes for social welfare.

The evidence from psychiatric experience on the whole supports the view that the creation and the maintenance of a situation of insecurity do not make for maximum efficiency. The doctrine in question is thought by many to be made scientifically respectable by evolutionary theory; but this view depends upon a misreading of Darwinism and its subsequent modifications. It is a hopeful sign that medical men are becoming more and more aware of their responsibility in guiding the thoughts of the community in matters that go to the very roots of the success of a society. Just as the individual as he matures has the need to develop a general point of view or a philosophy which will guide him in the major issues of life, so it is not less necessary for whole societies to have a systematic set of working principles deduced from the study of experience and undergoing a progressive evolution. Tradition after a time loses its force in a progressive society, which must continually try to abstract from its experience so as to profit by it more. It is here that sociologists, by their analysis of different patterns which have evolved spontaneously, can guide development in the directions most likely to be productive. Medical psychologists are especially in a position to do this because they see constantly the effect on human beings of blindly following traditional social convention and economic practice. The ancient Greeks, so eager to discuss the latest new thing in the market-place, would possibly find it difficult to understand our stress upon the value in our educational system of the study of the past.

It is a sign of the increasing awareness of the part that medical sociologists could play that the Royal

Medico-Psychological Association has recently summarized the evidence in support of the Beveridge plan for unemployment insurance. The report of the R.M.P.A. stresses the deplorable effects of mass unemployment. As well as the purely financial consequences there is the psychological harm that comes from fear and depression, and the inferiority feelings that arise from loss of social prestige. Mannheim among others has emphasized the need for work in the maintenance of a man's self-respect. The possession of a job is far from being simply a question of monetary reward. Accordingly the R.M.P.A. recommends not only a subsistence allowance but machinery for the rapid reinstatement of the man or woman in industry somewhere else when local conditions make local employment impossible. Reinstatement should occur before apathy has time to set in. The R.M.P.A. adopts the view, which is the product of experience, that it is only insecurity—for example, in the shape of uncertainty of employment or inadequate benefit—that produces malingering. What is required is not safeguards against malingering but medical and psychological help for social failure resulting from intellectual, temperamental, or neurotic handicaps. It is to the interest of the community to provide, not as little but as much as it can, for all those who are willing to play their part in it. The war has shown that what matters, even more than death itself, is the severance of home ties and the break-up of family life; and it is especially the latter that any scheme of subsistence allowances and rehabilitation must provide against. How often one has heard from individuals coming from families who had been through bad times of prolonged unemployment that “the whole family just lost hope.” In adults the inner discipline that results from good education is a far healthier safeguard against laziness than a permanent threat of external deprivation.

It seems that the answer to the question, “What is the best incentive?” does not lie in the negative, deterrent threat of the “sack” but in the positive incentive of a knowledge of security so long as one is willing to work; and very few people are unwilling. There is no more deplorable example of the narrow, merely financial, view than the failure to recognize that work means more than money which runs through the British system of Workmen's Compensation, where no attempt is made to provide for the reinstatement of the worker on a job except by forcing him by means of a meagre and diminishing allowance to return to his former job, if he can get it, or to eling to it long after he is medically unfit to do so. The sense of insecurity, the resentment, and the litigation that the present system induces, as well as the comparative futility of a lump-sum payment, are now increasingly recognized. It should be our responsibility to see that in any process of rehabilitation, vocational guidance and psychiatric social work are both brought into use. Psychopathic individuals should be rehabilitated in special centres of their own. The whole apparatus of the administration of sick benefit should be humanized, and Labour Exchanges so reformed that they lose their aspect of alms and suffering associated with the bad old days of the dole. The whole trend of these recommendations made by the R.M.P.A. displays the realization that security is not

harmful; that the average human being will tend to rise to his opportunities, and that those who prefer to remain sick, like those who break down in war, are proper subjects for psychiatric examination.

## MEDICAL ASPECTS OF PARACHUTE JUMPING

The U.S.S.R. first developed parachute jumping, both as a sport of civilians and as a valuable technique in offensive warfare. Even before the present war began they had made an exhaustive study of the medical aspects of the subject, the results of which were collected in a book by G. P. Greifer<sup>1</sup> in 1939. The Anglo-Soviet Medical Council has recently supplied an abstract of this, translated by H. Wareing. The whole approach to the subject is summed up by the observation that "parachute injuries, as has been proved by experience, are the result of carelessness in medical selection of parachutists, and inefficient training for and organization of parachute jumps." The major part of the work, therefore, deals directly or indirectly with selection, and it is interesting to find that, although physical examination is exhaustive and the list of rejecting disorders formidable, it is the psychological aspects of selection which have been studied most fully and found most profitable.

Repeated jumps at short intervals have been found to have a deteriorating effect, and even after single jumps there are changes in pulse rate, blood pressure, and urinary constituents, even including albuminuria and hyaline casts. Excluding the physical effects of structural disorder, such as hernias, incompletely united fractures, or an acute infection, the transient changes have all a psychological explanation, established by observation of jumpers, which is made on the ground, in the aircraft or on the training tower immediately before jumping, and on landing, time and time again. Their appearance and behaviour are noted and correlated with the physical changes which are found. All kinds of fear reactions are found in unsuitable pupils, including states of stupor or agitation. It is observed that persons with an unstable nervous system interrupt their training, are accident-prone, make foolish and catastrophic mistakes, and cannot deal efficiently with an emergency. Any evidence of functional or organic disorder of the nervous system is therefore a contraindication to jumping.

Trainees may be divided into four groups according to their behaviour in the plane before the jump. The first and largest (76%) are lively and excited, with rapid speech, flushed face, bright eyes, changing expressions, and general restlessness. The second (14%) are apprehensive—they look worried, preoccupied, and have pale faces, dilated pupils, and a dull expression. The third (3%) are depressed, indecisive, lethargic, and apt to be motion-sick, and the fourth (7%) are a mixture of the second and third. The first group jump confidently after one flight; the second need two or three, while the others will probably be failures. The selection appears to be based much more upon the man's reaction to his job than upon an initial assessment of his personality, and in this respect it is in line with the present tendency in the selection of air crews in this country and in the U.S.A. It is accompanied by a rigid medical examination similar to that used in the R.A.F., but it is followed by a vigilant follow-up throughout training. The man's successful progress is encouraged by a carefully controlled regime, which includes elaborate physical training and a course of education, the emphasis being again upon the psychological benefits rather than the purely

physical. Accidents and injuries are all regarded as avoidable. Errors in jumping account for 5%, and 95% are due to mistakes in landing; but the selector and teacher are blamed—not the pupil. Of the landing accidents 65% result from failure to observe the rules, which prohibit landing on irregular or frozen ground, in a strong wind, and so on, while 25% are caused by bad landing technique, particularly in relation to leg position, the commonest injury being to the ankle or knee, though spinal injuries occur from indirect violence.

Some of the attention to the details of safety which is enjoined in this admirable book is impracticable in wartime, where the technique of parachute jumping differs for high and low altitude. Two papers have recently been published in Germany by Diringsbofen<sup>2</sup> and Gauer<sup>3</sup> on the safety time limits which the jumper has at high altitude. The problem is to determine the correct procedure to prevent fatal effects from anoxia. The alternatives are to delay opening the parachute until the altitude is low enough to sustain life, risking the possibility of being insufficiently conscious to pull the cord, or to open the parachute immediately, risking death from prolonged anoxia. Resistance to anoxia is increased by hyperventilation on oxygen before jumping, and then holding the breath for as long as possible. The breath can be held for about a minute from 36,000 feet, which would enable the man to reach nearly 20,000 feet, at which height the parachute can be opened with safety. It is undoubtedly easier to discuss the ideal procedure than to put it into practice, but the Russian monograph makes it quite clear that actions enforced by rigid training will become automatic, turning a hazardous undertaking into a safe procedure.

## TOXIC TANNIC ACID

One of the most remarkable changes in surgical fashion concerns the treatment of burns with tannic acid. Introduced in 1925 by Davidson, it soon gained widespread adoption and was at the outbreak of this war accepted as the orthodox treatment, for which was claimed not only a satisfactory local effect on the burn but also some degree of control of the general effects. Since the outbreak of war it has been almost universally condemned on both counts. It is now not only regarded as an unsatisfactory, and by some a dangerous, local dressing, but it is also held responsible, as a liver poison, for some of the toxic effects hitherto attributed to burns. While the former may still be a matter of opinion, the latter seems to have been clearly established both by experience in human burns and also by animal experiments. In 1938 Wilson and his colleagues<sup>4</sup> described lesions of the liver in fatal burns, and subsequently came to suspect that these were due to tannic acid. Recent observations of his have not been published, but they were taken up by Cameron and his colleagues,<sup>5</sup> who demonstrated the toxicity of tannic acid to animals and showed that the drug could be absorbed from burns. Further confirmation of Wilson's work was afforded by Barnes, Rossiter, and Clark.<sup>6,7</sup> From America, Wells, Humphrey, and Coll<sup>8</sup> reported four fatal cases of human burns treated with tannic acid in which central lobular necrosis was a conspicuous feature, and they produced similar lesions in small animals by injection of tannic acid. Further evidence from animal experiments is contained in two recent papers. Baker and Handler<sup>9</sup> caused liver necrosis in rats and mice

<sup>1</sup> *Luftfahrtmedizin*, 1942, 6, 327.

<sup>2</sup> *Ibid.* 1942, 6, 340.

<sup>3</sup> *Brit. J. Surg.*, 1938, 25, 826.

<sup>4</sup> *Lancet*, 1943, 2, 179.

<sup>5</sup> *Ibid.*, 1943, 2, 218.

<sup>6</sup> *Ibid.*, 1943, 2, 222.

<sup>7</sup> *New Engl. J. Med.*, 1942, 226, 629.

<sup>8</sup> *Ann. Surg.*, 1943, 118, 417.

<sup>1</sup> *Medical Aspects of Parachute Jumping*. People's Commissariat of Health, 1939. Translated from the Russian by H. Wareing.

by injection of the drug and also by immersing the animals in a solution after denuding the belly of skin. Hartman and Romence,<sup>10</sup> working with dogs, found that some animals developed central necrosis with untreated burns, but that the incidence was increased by local application to the burn or by injection of tannic acid and also silver nitrate and mercuric chloride.

While caution is necessary in applying to human beings the results of animal experiments on burns, it should be noted that suspicion first fell on tannic acid as a result of experience in human burns, and animal experiments have been used only to obtain confirmatory evidence. It may still be maintained by some that tannic acid is a life-saving measure, and that even if it is toxic its use is justified by a general lowering of mortality. But, although mortality from burns has diminished since tannic acid was introduced in 1925, there is no evidence that to-day tanning has any advantage in this respect over other methods.

### ABSORPTION OF IRON

Preservation of the constancy of the internal milieu of the body usually depends either upon a balance between rate of production or absorption of a substance and its rate of usage or elimination (e.g.,  $\text{CO}_2$  tension of blood), or on the existence of a store which can be employed to even out lack of correspondence between rate of absorption and usage (e.g., glycogen). There are but few instances where level is regulated chiefly through control of the rate of absorption. But the recent work of Hahn and his co-workers<sup>11</sup> seems to suggest that the absorption of iron by the gastro-intestinal tract is regulated according to the size of the iron stores of the body. Despite a long-held belief to the contrary, McCance and Widdowson<sup>12</sup> have shown that elimination of iron from the body in the human subject occurs very slowly. A considerable excess of iron may harm those cells in which it is stored—e.g., liver and pancreas cells in haemochromatosis—and the body appears to be guarded against a too liberal intake of iron by the rate of gastro-intestinal absorption. Hahn and his colleagues have studied the uptake and shuttling of the elusive iron in the body in various conditions by following the course of the radio-active isotope after absorption. A known amount of radio-iron is introduced into the gastro-intestinal tract, and the amount circulating later in the red blood corpuscles is determined. In the experiments now reported they confirm their earlier findings<sup>13</sup> that the normal or the plethoric dog with ample reserve stores of iron absorbs very little radio-iron, but that the anaemic dog without stores will absorb 5 to 50%, varying with the amount administered, which promptly appears in new cells in the circulation. Since similar observations have been reported from the same laboratories for the human subject,<sup>14</sup> search has been made for the factors which control the absorption of iron. It has been shown that in dogs rendered acutely anaemic by haemorrhage absorption of radio-iron is within normal limits, but that after a week or a fortnight, when blood regeneration has begun and the iron stores have been depleted, the ability to absorb is increased and may be 5 to 15 times the normal. The means by which the iron reserves can affect the absorbing power of the gastro-intestinal mucosa is not clear; it is not through anoxia which may be consequent upon the anaemia. The giving of a dose of ordinary iron, however, 1 to 6 hours before the radio-iron in the anaemic iron-depleted dog causes a "mucosa block"—that is, the uptake

of radio-iron is less than anticipated. On the other hand, iron administered intravenously does not appear to affect intestinal absorption. The conclusion is tentatively advanced that absorption of iron by the mucosa involves a loose combination of the iron with an acceptor before it is passed on to the plasma. It is suggested that a substance such as ferritin or apoferritin<sup>15</sup> may be responsible. The rate of transfer of iron from the alimentary tract may be governed by the plasma iron concentration. In the normal animal with a normal plasma iron the acceptor mechanism is regarded as physiologically saturated with iron and incapable of picking up more from the gastro-intestinal tract. When the iron reserves are depleted the plasma iron concentration falls and transfer across the gastro-intestinal mucosa is possible.

### ADULT MORTALITY

It has often been pointed out that the improvement in what is called the complete expectation of life during the last century is mainly due to decreases in rates of mortality over the first few years of life. We are, however, still inclined to think that one reason why statesmen of 150 years ago reached Cabinet rank at an age which now would hardly qualify them for minor office was because few survived to be Elder Statesmen. That is a mistake. The circumstances of the country in 1806 seemed almost as grave as those of 1940, and an all-party Government was formed. The Cabinet consisted of eleven members: the eldest was 57, the youngest 26, and the average age 49. The Cabinet Mr. Churchill formed in 1940 was a much larger body, but we can compare the eleven members of his Cabinet holding the same offices (substituting the Secretaries of State for Air and the Dominions for the Lord-Lieutenant of Ireland and the Lord Chief Justice) as the Cabinet Ministers of 1806. The eldest was 67, the youngest 43, the average age 55. Of Lord Grenville's Cabinet only one died under 60; of the remaining ten eight survived 70, and four of these survived 80 years. The English Life Table of 1930-2 would not predict as good results; however, Cabinet Ministers of the early nineteenth century did not come from the general population but from the landed gentry. Indeed only Lord Sidmouth, whose father was Chatham's physician, could be described as of the middle classes, and even of middle-class mortality our knowledge is incomplete. A recent paper by Sir William Elderton and Mr. Ogborn<sup>16</sup> throws some light on the changes in the rates of adult mortality in middle-class males over the last 150 years. In Sir William's own office, the Equitable, there has been a steady improvement even for so advanced an age as 62. Taking the rate for 1763-1829 as 100, that for 1863-93 is 80 and for 1924-8 55. As age advances, the difference between past and present decreases and has disappeared by the age of 82. What may be the "law" of mortality at very advanced ages is unknown. The comparatively scanty exact records of survivorship at ages beyond, say, 90 can be "fitted" by many different "laws," including one which postulates the longevity of Methuselah as not an impossible but only a very rare event. It does appear that sexagenarian juveniles have a greater expectation of survival than had their great-grandfathers.

Dr. Hugh S. Stannus will deliver the Lumleian Lectures before the Royal College of Physicians of London on Tuesday, April 18, and Thursday, April 20, at 4.30 p.m. at the College, Pall Mall East. His subject is "Some Problems in Riboflavin and Allied Deficiencies."

<sup>10</sup> *Ann. Surg.*, 1943, 118, 402.  
<sup>11</sup> *J. exp. Med.*, 1943, 78, 169.  
<sup>12</sup> *J. Physiol.*, 1938, 94, 148.  
<sup>13</sup> *J. exp. Med.*, 1939, 69, 739.  
<sup>14</sup> *Ibid.*, 1942, 76, 15.

<sup>15</sup> *Science*, 1942, 95, 439.  
<sup>16</sup> *J. roy. statist. Soc.*, 1943, 106, 1.



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*Milton* 1 in 20, for example, has a pH of 8.89. *Dakin's solution* 1 in 10 (which

has the same content of available chlorine and hence the same oxidising power) has a pH of 10.64. *Milton* (full strength) has a pH of 10.7. *Dakin's solution* (full strength), which has half the content of available chlorine, has a pH of 11.61.

Because recent work emphasises the lack of irritant action (this is largely due to the absence of free caustic alkali). One surgeon gives as his reason for preferring an electrolytically prepared hypochlorite to a chemically produced solution the fact that after its action is completed only a saline residue remains, "whereas chemically prepared varieties, such as *Dakin's solution*, have more irritant end products."<sup>1</sup> Another states, "*Eusol* for treatment in the wards has been replaced by *Milton* solution in the strength of 1 in 20. This gives an isotonic solution, is quite painless and has the advantage that when its hypochlorite ele-

ment has finished action only normal salts are left. It was found that the boric acid left from *Eusol* tended to make the wounds somewhat painful and slightly boggy."<sup>2</sup>

For blandness, stability, low alkalinity combined with effective proteolytic action and innocuousness of end products the choice is—*Milton*."

<sup>1</sup> "Treatment of Burns by Envelope Irrigation," *British Medical Journal*, July 12th, 1941, p. 47.

<sup>2</sup> "Experiences in an E.M.S. Base Hospital in the London Area," *Edinburgh Medical Journal*, January, 1942, pp. 25-26.

★ For quotations for Bulk Supplies for Hospitals, etc., or information with regard to irrigation technique, write *Milton Antiseptic Ltd.*, John Milton House, London, N.7.

**MILTON**, the stable brand of Electrolytic Sodium Hypochlorite, non-caustic and of standard strength (1%)

## DISTRICT NURSING IN LONDON

The annual meeting of the Central Council for District Nursing in London was held on Feb. 24. In the report on the year's work it was mentioned that in some districts within the Metropolitan Police area the proposed new scales of salary for district nurses as recommended by the Rushcliffe Committee would not involve the local associations in much extra expenditure, but for the most part there would be considerably increased outlay, even though the Government would pay, through local authorities, 50% of the increase. It was the hope of the Central Council that the new standard would make it possible for trained nurses to contemplate a career in this vital and interesting work with the knowledge that pay would be reasonably adequate.

Another matter mentioned was that an increased number of applications have recently been received for "analgesic bursaries" which have been offered to enable nurses to receive instruction in the administration of gas-and-air, and the District Associations have found it necessary to make an effort, which was not possible in the more difficult years of the war, to release nurses for the period of the course.

The District Nursing Associations covered by the Central Council number 84, and during 1943 they received from various charities, funds, bequests, and subsidies a total sum of £13,072. The trustees of London Parochial Charities placed at the disposal of the Council £3,500 for distribution. The London County Council, in addition to its contribution of £7,461 for public assistance nursing, continued a grant of £200 for the nursing of the complications of midwifery. District nurses during the year made, under the L.C.C. arrangements, 132,800 visits to 5,478 patients for general nursing, and 103,600 visits to 1,412 diabetic cases for the purpose of insulin administration.

At the conclusion of the meeting of the Central Council Sir Stanley Woodwork, chairman of the Executive Committee, presided at a reception in honour of Sir William J. Collins, who has been chairman of the Central Council for over thirty years. Occasion was taken to mark the sense of respect and affection in which Sir William is held by those associated with nursing, and of admiration for his extraordinary record of service.

## ECONOMY IN THE USE OF DRUGS

The Therapeutic Requirements Committee of the Medical Research Council has made the following amendments in the entries in War Memorandum No. 3:

**Ascorbic Acid.**—Reclassified B (essential for some purposes but not for others; to be used with strict economy); it should be prescribed only in the presence of medical indications for its use; not to be used as a supplement to normal diet.

**Cod-liver Oil.**—Reclassified A (essential or readily available).

**Vitaminized Oil.**—Reclassified B; this preparation is in short supply and should be used only when cod-liver oil is not tolerated.

Speaking at a conference held at the National Institute for the Deaf, in London, Mr. George Tomlinson, Parliamentary Secretary to the Ministry of Labour, appealed to voluntary organizations to co-operate with those responsible for the administration of the Disabled Persons (Employment) Act. Under the interim scheme, which had been in operation for the past two years, many disabled men had, he said, been trained and put on to work which would previously have been regarded as beyond their capacity. To-day 37 different jobs in one particular section of the engineering industry were being undertaken by blind workers. Deafness could be and often was a handicap in obtaining and retaining employment, and persons so handicapped came within the provisions of the Act. They would go to a vocational training centre to be taught a new job, and not only would they be paid while being trained, but those dependent upon them would be looked after. The expenses of training would be defrayed out of moneys provided by Parliament. After training the disabled person would be included in a register of all whose disability was a handicap in obtaining and retaining employment (there would be registration at all local labour exchanges) and an employer of more than 20 persons would be under an obligation to take a percentage or quota of disabled persons. Thus the deaf would be assured of work because the number on the register would determine the percentage required to fill the posts available. Mr. Tomlinson concluded by saying that it would be possible to form a nucleus round which to build the central advisory committee and the local advisory committees to be set up under the Act.

## Reports of Societies

## AETIOLOGY OF INFECTIOUS JAUNDICE

The Section of Experimental Medicine and Therapeutics of the Royal Society of Medicine organized a discussion on March 14 on the aetiology of infectious jaundice. Dr. R. D. LAWRENCE presided.

## Animal and Human Transmission

Dr. F. O. MACCALLUM described recent work recorded in the literature on transmission of infective hepatitis in animals and human beings. The animal experiments were almost wholly negative, but it had been shown that blood in the pre-icteric stage and up to the second day of jaundice was infective for man. The experiments on animal transmission by Findlay, Murgatroyd, and himself yielded negative results on using whole blood, serum, nasal washes, faeces, and urine from pre-icteric and first-day jaundice, and inoculating by all possible routes hedgehogs, rabbits, guinea-pigs, and many other species of animals. Among experiments in human transmission, Cameron in Palestine had reported results indicating that there was an infective agent in the blood from the second day of jaundice, and Vogt, a German worker, had reported several positive results of inoculation into volunteers of duodenal juice, blood serum, and plasma in the pre-icteric stage. In the case of homologous serum jaundice, again, the animal results seemed invariably to be negative, but in man some positive results were recorded. Bauer and himself had taken the serum from seventh-day jaundice and inoculated five volunteers subcutaneously; two of them developed jaundice, and another a rise in bilirubin lasting for about a week.

## Homologous Serum Jaundice

Dr. A. M. MCFARLAN gave a brief sketch of an outbreak of hepatitis after the use of mumps convalescent plasma which had been studied by the Red Cross and Harvard field hospital unit. Jaundice or at least a rise in bilirubin developed in a number of cases after the intravenous injection of the plasma. The picture of the condition in 47 cases admitted to hospital resembled that of infective hepatitis. There were no deaths, and recovery was in all cases complete. When the signs and symptoms were analysed and compared with the findings in 39 cases of ordinary infective hepatitis admitted to the same hospital over roughly the same period one or two striking differences appeared. They are best set out in the following table:

	Plasma hepatitis (47 cases)	Infective hepatitis (39 cases)
	19 per cent.	62 per cent.
Vomiting	.. .. .	.. .. .
Arthralgia	.. .. .	.. .. .
Rash	.. .. .	.. .. .
Enlarged liver	.. .. .	.. .. .
Palpable spleen	.. .. .	.. .. .
Fever, 100° F.	.. .. .	.. .. .

Therefore there were some reasons for thinking that the disease differed a little from ordinary infective hepatitis. The laboratory studies included various examinations which excluded the possibility that it was an outbreak of virus disease. He thought it was clear that icteric batches of serum or plasma did turn up from time to time, but when cases were brought forward as plasma jaundice or homologous serum jaundice every effort should be made to discover, first, whether there were cases of infective hepatitis in contact, and, secondly, the source of the blood or blood products concerned. Without some idea of where the blood came from it was practically impossible to be sure in these cases. Until the aetiological agent was isolated from some of these homologous serum jaundices and from the infective hepatitis cases, or some specific serological test was developed, they would have to go on arguing whether the conditions were the same or different. All he had hoped to do was to furnish something to argue about.

## Post-arphenamine Jaundice

Major J. MARSHALL said that jaundice might occur at any time during the arsenical treatment of syphilis, but there were times when it tended to occur most frequently. There was a possibility of hepatitis within 6 to 15 days after the arsenical injection, and also of a delayed hepatitis about 100 days after

the start of treatment. It was possible for a patient to have both the early and the delayed hepatitis. The early hepatitis varied in severity right up to frank icterus, but it was usually quite mild and transient. The delayed jaundice occurring from the twelfth to the seventeenth week after the beginning of arsenical treatment was the commonest variety. It occurred in any type or stage of syphilis in the adult. Clinically this post-arsphenamine jaundice was indistinguishable from infective hepatitis; biochemically no significant difference between the two had been shown, and the liver changes were said to be the same in both diseases. Post-arsphenamine jaundice varied in severity from the mildest form to a fatal acute yellow atrophy. It was obvious that the arsenic itself had some part in the story, but it might not be the most important factor. The incidence tended to rise in times of economic stress. It varied enormously from clinic to clinic and from command to command. The incidence at the civilian and the R.A.F. clinics was much lower than at the Army clinics in the same area, though the methods used were not materially different. The incidence of jaundice among officers was at least as high as among other ranks, yet in peacetime the counterpart of the officer—namely, the private patient—practically never got this jaundice. The incidence in his own female clinics, civil and military, was well under 5%, yet Service women under his care were treated in exactly the same way as men. The only outstanding difference between post-arsphenamine jaundice and infective hepatitis was that the one had an incubation period of 100 days and the other of 30 days, and the former appeared to be spread by syringe infection. An attack of post-arsphenamine jaundice seemed to offer no immunity against infective hepatitis. The control of the condition was in the proper sterilization of syringes in clinics and in increasing the diet, particularly protein.

Major SALAMAN said that, being convinced that post-arsphenamine jaundice might be spread from patient to patient in clinics by means of syringes, he had inaugurated in his own clinic a scrupulous ritual with regard to syringes, with the result that there had been a significant drop in incidence. The fact that so many of these cases were now being noted was due partly to the shortage of syringes, which made the ordinary methods of using them more dangerous than formerly because they were not allowed to lie long enough in the disinfectant between injections, and partly to the fact that there might be an increase in the number of persons in the population who were healthy carriers or were in the prodromal stage.

#### Yellow Fever Vaccine Jaundice

Col. T. BADGER, U.S.A.M.C., said that epidemic hepatitis in the United States Army made its appearance in the spring and early summer of 1942. Northern Ireland was the centre of nearly all the cases appearing in the United Kingdom, but outbreaks were noticed wherever the troops were stationed. The aetiology was obscure. There appeared to be an association with yellow-fever vaccination, but it could be clearly stated that the jaundice was not yellow fever in any form. Convalescence was slow, but recovery was complete. The mortality was under 1 in 1,000. The number of weeks after yellow-fever inoculation when the jaundice appeared averaged sixteen. The jaundice-producing agent in yellow-fever vaccine was shown to be filterable; it survived drying at 4° C. over long periods, and survived heat at 56° C., and appeared to be neutralized by radiation.

In some further discussion Dr. McLACHLAN mentioned the serum colloidal gold reaction in infective hepatitis and in arsenical jaundice respectively. In a series of 105 cases of infective hepatitis this reaction was positive in 95%, and in 50 cases of arsenical jaundice it was positive in 42%, appearing to indicate some essential difference in liver metabolism. Dr. LOUITT gave grounds for suggesting that the transmission of arsphenamine jaundice was not purely a question of the transference of an infective hepatitis virus from case to case, but of an agent in human serum, whatever it might be, from one person to another. Sir HENRY TIDY recalled two recent developments in the study of jaundice. One of them arose about 1928-30, when catarrhal jaundice, as it was called, in old people attracted attention. The older the patient the longer the clinical course. The other arose about 1935 with the observation that jaundice was comparatively common in

glandular fever, though he himself had for many years noticed an occasional association. This, however, was now so common that he saw in a recent description of glandular fever the setting apart of a definite subgroup, which it was said began with jaundice. He thought there was some tendency to look upon hepatitis, when it occurred, as a single entity, and to neglect lesions in other parts of the body—for example, the kidneys. There was the further question whether in all these cases the same factor was concerned and whether, if it was the same factor, it might be infectious on transmission by one route and not by another.

## Correspondence

### The Effects of Cold

SIR,—Will you allow me to comment upon the papers and correspondence on the cryopathies which have appeared in recent issues of the *Journal*?

In their paper (Feb. 12) Majors Goldstone and Corbett have contributed a most interesting new observation to our rapidly growing knowledge of the effects of cold. The appearance of hepatic and duodenal damage has not been reported before. I think, however, that the difficulty of clinical research on active service far from libraries has led them into certain errors.

It is not "surprising" that they should have observed immersion foot at temperatures above freezing-point. This phenomenon was noticed by Larrey in the Napoleonic wars and by many military surgeons since. I stressed this in a paper which they quote (*Lancet*, 1941, 2, 689—not vol. 1, as stated by them). The explanation is very simple. Water is a good conductor of heat, and if the feet are wet they lose heat rapidly at any environmental temperature below 98° F. If the loss of heat is sufficient to overcome the body's first adaptations, vasoconstriction and consequent ischaemia occur. On the other hand, dry air is a very poor conductor and extreme cold is needed to produce damage in such an environment. It was failure to understand this fact that led to the appalling casualty rate from trench foot and frost-bite in the last war (84,670 cases in the British Army alone). Most of the damage occurred at mild temperatures in France and Flanders.

The actual freezing to hardness of the skin has been overstressed. It is true, as Lake said in 1917 (*Lancet*, 2, 557), that damage tends to be more severe if solidification occurs. I cannot, however, agree with Goldstone and Corbett (Feb. 12) or with Lake (Feb. 26) that it is the essential feature. On the one hand, severe damage, even gangrene, has often been observed (indeed, by Goldstone and Corbett themselves) at temperatures well above the freezing-point of skin. On the other hand, as I pointed out in another paper which they quote (*Lancet*, 1942, 2, 695), solidification can take place without damage. I showed this in the feet of cats, the tails of mice, and (accidentally) my own fingers. Pathologically, there is no clear distinction between "true frost-bite" and "chilling" (Greene, *J. Path. Bact.*, 1943, 55, 259). Clinically, the distinction is slightly greater, but it is only one between acute and subacute disorder. The concept of "mixed forms" is therefore unnecessary.

My friend Mr. Norman Lake remarks (Feb. 26) that "it has, of course, never been suggested that immersion foot bore any relationship to true frost-bite." On the contrary, I have often suggested it and am still unable to understand the grounds for differentiation. With the rest of Mr. Lake's letter I am in enthusiastic agreement.—I am, etc.,

RAYMOND GREENE.

### "Immersion Foot" and Cold Therapy

SIR,—I am indebted to Mr. Norman Lake for drawing our attention to his very important conclusions of nearly 30 years ago. However, I am at a loss to understand why it appeared to him we implied that trench foot and frost-bite were probably synonymous terms. That there has been until comparatively

recently a certain tendency to confusion of these three conditions one with another also cannot be denied.

We were concerned in our article with presenting a conception of aetiology and of confirming to some extent the clinical picture portrayed in the very able article of Ungley and Blackwood. Our suggestion of mild active vasodilatation was based purely upon our conception of the nature of this condition, as opposed to pure frost-bite, and I well recall the relief of pain that resulted from the use of the cradle, particularly in the batch of ten that were observed. They were observed constantly over a period of two months, and gangrene certainly did not occur.

I may add that while I read Mr. Lake's second edition of his book *The Foot* with great interest and benefit, the third edition was unavoidably not available to us at the time of writing our article.—I am, etc.,

H. VINCENT CORBETT.

### Pulmonary Emphysema

SIR,—Recently Christie, in his Goulstonian Lectures, has directed attention to the inadequacy of the pathology of this condition, and I suggest that this is due to the general neglect of the importance of the bronchial circulation. Since Christeller (1916), Lemoine (1936) has written a monograph on the importance of the thrombosis of the bronchial artery as the cause of chronic adult dilatation of the bronchi, although Brenner (1935), in his *Pathology of the Pulmonary Vessels*, alludes to the atonic dilatation of the bronchi in pulmonary emphysema.

At routine necropsy it is the commonplace for the bronchial vascular system to escape notice, as it is an early casualty in the evisceration of the thorax. For this reason it is not remarkable that this portion of the vascular system is not investigated, but it is regrettable that this system of analogous importance to the coronary system should be overlooked in pulmonary disease.

The extent of the bronchial vascular supply is not generally appreciated. In man it is not only the nutritive avenue of the bronchi and intrapulmonary tissues, but supplies the visceral pleura, oesophagus, pre-vertebral muscles, and occasionally the anterior portions of the vertebral bodies. Its intrapulmonary supply is also given to the pulmonary nerve trunks and to the vasa vasorum of the pulmonary vessels (Berry, 1935).

Now, in considering the factors in the development of emphysema, admitting the usual causes of chronic bronchitis and asthma, the first stage is the disruption of the integrity of the bronchial circulation. This is a major factor in the pulmonary blood flow, as it has been shown that the bronchial and pulmonary vascular systems are haemodynamically linked in a capillary bed which is partly common to both (Berry and Daly, 1931). This mainly affects those capillaries which are in contact with the alveoli. It follows that the impairment of the pulmonary tissue secondary to the loss of its proper nutritive channel—the bronchial supply—will permit extensive damage on the stress and strain of coughing on the weakened lungs. The term "hypertrophic" is a pathological misnomer when applied to pulmonary emphysema, as the bulk of the distended lung is due to loss of elasticity and is really "atrophic" when studied histologically.

If we consider the distribution of the bronchial circulation, it can be seen that any diminution in supply to the vasa vasorum of the pulmonary artery will give rise to the atherosclerosis of these vessels to which Christie makes reference. In those cases of emphysema which arise without pre-existing bronchitis or asthma a primary lesion of the bronchial vascular system is responsible (and overlooked). Conversely, the glass-blower or wind instrumentalist is in no danger of emphysema so long as his bronchial circulation is intact.

Clinically, I find the tape measure does not bear any true relation to the degree of dyspnoea. The signs I find of the greatest value are the hyperresonant percussion note and the encroachment of the emphysematous lung on the complementary pleural spaces.

I agree that pulmonary vascular congestion is the true cause of dyspnoea, as shown by its disappearance in those few cases where the pulmonary valve has become incompetent. This similarly happens in mitral stenosis occasionally.

Sufficient has been said for the appreciation of a bronchial vascular lesion as the primary factor in the production of emphysema, with strain or raised intrapulmonary pressure against a closed glottis as the secondary factor. In no way am I seeking to minimize Christie's points, but I would suggest that there is a lot to be said for reversion to the old technique of cadaveric vascular injection prior to investigation of pulmonary disease.—I am, etc.,

BURTON-ON-TRENT.

J. L. BERRY.

### REFERENCES

- Berry, J. L. (1935). *Quart. J. exp. Physiol.*, 24, 305.  
 — and Daly, J. de B. (1931). *Proc. roy. Soc. B.*, 109, 319.  
 Brenner, O. (1935). *Arch. Intern. Med.*, 58, 211 et seq.  
 Christeller, E. (1916). *Virchows Arch.*, 223, 40.  
 Lemoine, J. M. (1936). *La Thrombose de l'Arrière Bronchique*, E. Le François, Paris.

### Gold Treatment of Arthritis

SIR.—Your leader (March 4, p. 329) commenting on the work of Freyburg, Bloch, and Levy on the use of gold in arthritis is timely and interesting. Their work in 1941 drew attention to the fact that the usual dosage of gold was too high, producing a greater frequency of toxic reaction with no corresponding rise in therapeutic efficiency. This has been appreciated from clinical experience for some time by those interested in these matters, but gold treatment is also used by many practitioners with no great experience.

Freyburg *et al.* in their more recent work have added to knowledge, but still leave something to be said from the clinical angle. Their present view is that 50 mg. of myocrisin (or sanocrisin) weekly is the minimal dose which produces a therapeutic effect with any degree of certainty. This, however, is still high enough to cause toxic reactions (in their case, and under expert guidance, 17%). As a proposition stated in general terms let me hasten to say that this would meet with general approval. Unfortunately this hypothesis will be accepted by the doctor who only uses gold salts occasionally as the whole truth and nothing but the truth. As in so many cases, the real truth is a compromise and could be stated as follows.

There are many cases of infective (or rheumatoid) arthritis which are resistant to gold treatment at any dose less than 50 mg. weekly, but there are also many cases of arthritis which respond to gold treatment at a much lower dosage level. As an example: 400 cases of infective arthritis have been treated over the last 10 years with crystalline salts of gold. Of these about 25% have proved entirely resistant to gold in any dose, and little but disaster has followed increasing the dose over 50 mg. of the salt intramuscularly weekly. Of the remainder about 50% have been found to respond as well with 5 mg. weekly as with 50 mg. The remaining 50% have to be raised to the top dosage to achieve the desired result.

With this experience it can be said with some hope of approximating to the truth that, from the point of view of gold therapy, cases of infective arthritis can be divided into three groups: (a) Those entirely resistant to gold. (b) Those who only respond when the dosage is raised to the ceiling level of 50 mg. of a crystalline salt weekly. (c) Those who respond to gold in the very smallest doses (5 mg. weekly). One further deduction can probably be safely made. Those who respond most satisfactorily to the small doses are those with a low sedimentation rate. This is fortunate, as in my experience it is just these cases which react badly to the larger doses. Although a dose of 5 mg. is not put up by the commercial firms at present, so far as I know, it is quite a simple matter to take half a 10-mg. ampoule, which can always be obtained.

Following the use of this technique only one case of mild dermatitis has occurred in my practice in the latest five years. So far as I can tell, until the cases are statistically analysed the percentage of "symptom-free" patients remains fairly constant.—I am, etc.,

LONDON, W.1.

ERNEST FLETCHER.

### The "Extra Pharmacopoeia"

SIR.—The *Extra Pharmacopoeia* and the *British Pharmaceutical Codex* have established their positions as works of reference so firmly that the attack on them in the review of Volume II of the *Extra Pharmacopoeia* which you published on March 18 cannot pass without a protest from the Pharmaceutical Society.



Your reviewer acknowledges the existence of Volume I. Nevertheless in his search for something to give spice to his criticism he appears to suggest that Volume II stands by itself. Had he studied its contents and compared them with those of Volume I he would have reminded himself that Volume I deals generally with new drugs and advances in medicine and Volume II with the numerous subjects ancillary to those dealt with in the first volume. This division does in fact avoid the "jumble of pharmacognostical information and analytical methods on the one hand with new drugs and advances in medicine on the other" of which he complains. Is it not the duty of a conscientious reviewer to study the contents of the book under review?

Your reviewer is wrong when he says that there is "a lack of connexion" between the Society's Pharmacological Laboratories and its publications; the staff of the laboratories contribute largely to the publications. He is wrong, too, when he complains that the books lack "the benefit of that kind of pharmacological advice which can only be given by those engaged in or trained in research." Leading pharmacologists have ungrudgingly given their help and served as members of revision committees. When he asks, Who is interested in the determination of rotenone in derris? is he not in fact saying, "I am not interested; therefore omit it"? What would his opinion be of the views of any for whom the book fell open at page 171, instead of page 163, and who might deplore the description of methods for the biological assay of digitalis? From his disregard of other sections of this volume of 1,217 pages, dealing with, for example, proprietary medicines, chemotherapy, biological analysis, vitamins, and electrotherapy, one might, perhaps unfairly, conclude that he had not considered it advisable to allow the book to open at any other page.

His determined disregard of Volume I provides him with the grounds upon which he complains of "strange omissions" in the field of new drugs. Let us consider the drugs he names: thiourea and thiouracil have been introduced in this country since the last edition of Volume I was published and will be discussed in the next edition. Pethidine was not known by this name when the last edition of Volume I was published; it was available only in the proprietary form of dolantal. (It was this proprietary form that was the subject of the paper in the *Quarterly Journal* which your reviewer mentions, a paper dealing solely with pharmacology, and not appearing until after Volume I had gone to press.) He has ignored the description of dolantal in Volume I and overlooked the publication of the recent Supplement to Volume I reviewed in your issue of March 11, in which pethidine is included as the name approved by the Medical Research Council for this substance.

A pedestrian review may make dull reading, but it often has the merit of contributing solid suggestions for improvement. Your reviewer might have had less fun, but he would have done better justice to his reputation and that of your esteemed journal had he approached his task with something of the care and pains that have gone into the production of this book over the last four years.—I am, etc.,

HUGH N. LINSTAD, JR.

17, Bloomsbury Square, W.C.1.

Secretary, Pharmaceutical Society  
of Great Britain.

### How to Break off Alcohol

SIR,—Your issue of March 18 (p. 399) contains an annotation on the so-called conditioned reflex method of treating alcoholics. The underlying idea of associating various drinks with violent nausea originally was given a very elaborate setting or ritual by Voegelin. This ritual subsequently has been modified, but the results obtained are, in my opinion, due to suggestion rather than to conditioning. The number of repetitions is far too small to establish a conditioned reflex, and, as with all forms of treatment for alcoholism, the good will of the patient himself remains essential.

Emetine and apomorphine, apart from their emetic effects, are drugs of long-standing reputation in the treatment of alcoholism and other addictions. Their drastic exhibition reinforced by powerful suggestion does not, in my experience, establish a conditioned reflex, though their administration in this way is so highly disagreeable as to make the risk of a repetition worth while avoiding.

So far so good, but there is a subtle danger in all such violent methods, even when, superficially, they appear successful. Alcoholism must be regarded as a symptom, and its suppression by so-called conditioned reflex methods while its cause remains untreated is a temptation which should be understood and scrupulously avoided. Unless the predisposition of the addict is recognized and treated, he, although possibly eschewing alcohol, will resort to some other method of side-stepping his difficulties. Many alcoholists, particularly doctors, who try to cure themselves thus become polynarcomaniaes.

Apart from recourse to other drugs there are many ways in which the psychologically untreated addict may show that merely "to break off alcohol" is to bring on something else—another and possibly a worse symptom. To warn the unwary against stumbling into this pitfall is my excuse for trespassing upon your valuable space.—I am, etc.,

Caldecote.

A. E. CARVER.

### Effect of Pregnancy and Parturition on Pulmonary Tuberculosis

SIR,—In his interesting review of 100 cases (Dec. 18, 1943, p. 775) and subsequent letter (Feb. 5, p. 196) Dr. Cohen blends cautious comment with precipitate deductions, and in the interests of the tuberculous woman some warning must be given against the acceptance of his "conclusions" without fuller analysis. They were: (1) Pregnancy and labour *per se* rarely exert any harmful effect on the progress of a woman known to have suffered from pulmonary tuberculosis. (2) It follows that therapeutic abortion is not a procedure to be resorted to simply because a woman is known to have suffered from pulmonary tuberculosis. (3) Active pulmonary disease is seldom accelerated by pregnancy and labour, and I have found that in such cases, treated under favourable conditions, pregnancy has been little more than an incident in their tuberculous career.

It should be noted, therefore, that, by accident or design, the Essex arrangements (as described from 1937 onwards) adhere closely to one section of a more extensive scheme which was advocated at a special discussion on this subject during the B.M.A. Conference at Oxford in 1936, when "minimal harm" cases (now brought forward by Dr. Cohen) were already acknowledged, and when practical problems were investigated for giving a greater number of pregnant tuberculous women this degree of advantage over their previous possibilities. An overwhelming weight of evidence was produced at that conference to prove the ever-present dangers of pregnancy for the tuberculous woman, and hence the aim of the Oxford scheme was to counteract these dangers in every possible way by the fullest co-operation between obstetricians and tuberculosis workers. The good results in Essex indicate the value of such a scheme, but, nevertheless, a danger does not cease to exist merely because it is brought within a certain degree of control, and I feel strongly that it would be an unnecessary risk for the patient if we were now to accept the first and third "conclusions" of Dr. Cohen of Black Notley rather than the considered opinions given at Oxford in 1936 by, among others, Prof. Cohen of Liverpool.

Further, Dr. Cohen's deductions are not supported by the latest work elsewhere. It cannot be granted that the supervision and treatment of the tuberculous woman are in any way less in the London area than in Essex; in fact, this must be a material understatement of London's facilities! It may therefore be of interest to make it clear that, to many who have specialized in the care of tuberculous women in London during the last 20 years, the following facts stand out prominently:

(1) In numerous cases the "onset" of pulmonary tuberculosis can be ascribed definitely to the period of a pregnancy; hence pregnancy must retain its place as a prominent precipitating factor in the development of the disease.

(2) In no case can it be shown that a pregnancy has brought about any permanent benefit to the lungs of the tuberculous woman.

(3) A proportion of cases of inactive pulmonary tuberculosis manifest little, if any, harm from a single pregnancy, but this group mainly consists of cases where the disease has been arrested for at least two years, and, even in them, subsequent pregnancies are prejudicial.

(4) The large majority of "active" lung cases tend to deteriorate appreciably during the pregnancy or within a few weeks after labour.

while with bilateral disease the retrogression is out of proportion to the degree of earlier involvement.

(5) To achieve the minimum of ill effect it is essential that combined obstetrical and tuberculosis treatment (preferably under sanatorium conditions) be provided for the tuberculous woman as soon as the pregnancy is detected, that the confinement should be made as "easy" for her as possible, and that intensive tuberculosis treatment should be continued for several months following labour.

(6) While therapeutic abortion is not undertaken as a "routine," in certain cases it is essential for safeguarding the patient's life; but from the tuberculosis standpoint, it can on no account be attempted, without still greater risk to the woman, after the sixteenth week.

It is not within the scope of this letter to amplify the individual points (which are not incompatible with the Essex results) nor to discuss special measures adopted for improving the outlook for both woman and child. But these findings definitely preclude the acceptance of Dr. Cohen's first and third conclusions, while somewhat elaborating his second.—I am, etc.,

Grove Park Hospital, S.E.12.

M. H. LOGG, M.D.

### Shock Treatment of Mental Disorder

SIR.—The true reason for the controversy about shock therapy in mental disorders (Dec. 25, p. 829, and Jan. 8, p. 60) seems to be that this new therapeutic approach undermines certain basic psychiatric concepts. Personal experience with electric shock therapy in almost 2,000 patients in two New York hospitals, suggests an answer to some of the questions brought up in the correspondence. Comparison of results in acute psychotics in an institution and in a second series of voluntary patients offered valuable information on the question shock therapy and/or psychological treatment.

Shock therapy is mainly indicated and is self-sufficient in acute psychoses. In my institutional material no psychotherapy of any kind during or after electric shock therapy was applied; the results were surprisingly good. On the other hand, the patients of the non-institutional group, consisting of borderline cases between neurosis and psychosis, were usually subjected to psychotherapy during and after electric shock therapy. The results were poor.

It is the dramatic symptoms of the psychoses which are accessible to shock therapy but not to psychotherapy. On the other hand, neuroses as well as borderline cases between neurosis and psychosis do poorly under shock therapy. Thus the two therapeutic approaches seem to have quite a different field of application. Dr. Shepley is right in saying that convulsive therapy also promotes accessibility to a later psychotherapy, but this is an application of secondary importance. The types of illness that respond to shock therapy most convincingly do not yield to psychotherapy during the psychosis, and in our experience do not need it afterwards.

It is certainly more satisfactory and appeals more to our intellectual needs to treat with psychological means than to press the button of an electrical machine. No one who has seen the predictable spectacular results in depressions and catatonic stupors or excitements will object to convulsive therapy. But it is disappointing for us to see such results with a method which we are still completely unable to understand. The great progress made in a group of patients where we were helpless before should give us satisfaction as physicians, even though it interferes with the concept of mental illness as a psychologically determined and, therefore, psychologically treatable disease. It should reopen the question of the process underlying mental illness. Our attitude should be not to object to a method because it is empirical, but to use the empirical knowledge for a new scientific approach to the basic problems of psychiatry.—I am, etc.,

New York.

LOTHAR B. KALINOWSKY.

### Acute Respiratory Conditions in African Soldiers

SIR.—Lieut.-Col. W. W. MacNaught and Major Murray-Lyon have drawn attention to such an important problem in their article on acute respiratory infections in Africans (Sept. 11, 1943, p. 324) that it should not go without support from others who have shared their experience.

During almost the same nine months to which they refer, but on the other side of the continent, a large hospital for East

African soldiers admitted 2,071 cases eventually diagnosed as "pneumonia," placing this condition second only to dysentery as a cause of medical admissions. But the case mortality of pneumonia in this hospital was more than double that in the West African series, and in nine months 85 patients died. In fact, many more patients died from pneumonia than from any other group of diseases in the medical wards, and this in spite of the rapid response to sulphapyridine shown by the majority of patients.

The following two observations in support and amplification of the West African experience are put forward as the result of post-mortem examinations upon 83 Africans who died of pneumonia. (a) Upper lobe involvement was common; the right upper lobe was affected in 52 cases and the left upper lobe in 31. (b) A large proportion of the deaths occurred either very early or very late in the disease. In the former the picture was that of septicaemia with minimal lung changes. In the latter there appeared to be a delay of resolution in the areas first affected, so that these lobes remained in a solid, cheese-like condition, while successive involvement of other lobes gradually reduced the remaining available air space. These latter cases had generally proved resistant to sulphapyridine, and one is led to suggest that lack of resolution may have been partly mechanical (the African dislikes moving his chest when ill) and partly due to a damaged lymphatic system, which, no doubt, had been previously visited by many nematode larvae in transit.

It is of interest that the second most potent cause of death in the East African hospital in these nine months was cerebrospinal fever (35 deaths)—another "European" disease—adding weight to the authors' contention that familiar diseases should not be neglected in the Tropics.

In the same article there is an implied criticism of our lecturers in tropical medicine, in that they do not stress the importance of respiratory infections in black troops. It is true they do (or did) not, but they may be excused if they assume that we who are sent to the Tropics go with a working knowledge of European diseases. If under a tropical sun we lose our perspective in medicine it is not their fault; yet that perspective is only too often lost, and Lieut.-Col. MacNaught and Major Murray-Lyon do well to attempt to restore it.—I am, etc.,

A. B. RAPER,  
Major, R.A.M.C.

### Tonsillectomy in Children

SIR.—Mr. T. B. Layton is often original and always dogmatic, but on the occasion of his letter in the *Journal* of March 11 he eclipsed his previous best. Some twenty years ago I remember the late Mark Hovell addressing the Section of Laryngology at the R.S.M. and there advocating that a portion of the tonsil should always be left; the suggestion was rejected unanimously. Even so, history repeats itself, and here we have the hydra-head raised again.

For years I had perforce to remove pieces of tonsil left behind by my colleagues, and some, I regret to say, of my own. To-day I felt that at last, as a specialty, we knew how to remove tonsils. No, I hope my friend Mr. Layton will stick to his own motto: "The tonsil, all the tonsil, and nothing but the tonsil," or a useful paraphrase, "All or nothing." Remove the whole tonsil or leave it alone, and this includes treatment by diathermy, caustic paste, and cauterization. In view of his recommendation to leave a small portion of the tonsil behind, I am not surprised at his evident reluctance to undertake the operation.

The letter of Mr. Carew-Shaw was sane and well balanced. I know of no operation which, when properly carried out in suitable cases, has a greater value to a child—both physically and mentally—a fact which is well recognized by parents themselves.

I am in agreement with Mr. Layton that a careful examination should first be undertaken. I would make the constructive suggestion that this examination should always include the antra; and where the antra are found to be dull they should be washed out. A persistent antral infection in children is often the cause of colds and infections following an otherwise successful operation.

The operation is not to be undertaken lightly or inadvicably, but only after due consideration, and with skill, care, and

gentleness, while mental shock must at all costs be avoided. When so carried out the operation is of great value in promoting the health of the rising generation.—I am, etc.,

Birmingham.

MUSGRAVE WOODMAN.

SIR,—We entirely agree with the views expressed by Mr. T. B. Layton in his recent letter regarding the question of tonsillectomy in children. He states that "no such administration has as yet been set up which will give that minimum of a quarter of an hour between the parent upon whom the responsibility for decision rests and the surgeon in whose hands the responsibility for advising the operation is finally put." We think it might be of interest to him to know that such an administration was initiated in a general hospital eighteen months ago. Here cases may be reviewed weekly or monthly by a team of workers whose aim is a fuller comprehension of the functional efficiency of the entire respiratory tract, with an attempt at classification of "criteria" whereby the operation of tonsillo-adenoidectomy may be considered justifiable and good results reasonably expected.—We are, etc.,

F. C. W. CAPPS.  
E. GWYNNE-EVANS.

Willesden General Hospital.

### Infiltration of Oxygen for Gas Gangrene

SIR,—Over ten years ago I made short notes of the treatment and progress of a case of gas gangrene which occurred in a hospital where I was a house-surgeon. I lost the notes soon after, but came across them recently and give them below in detail.

On Aug. 28, 1933, a well-built man of 43 years was admitted to hospital following a road accident. He had sustained a compound fracture of the right ulna in its upper third, the wound being on the posterior aspect of the arm, and a lacerated wound of the right antecubital fossa. He had no other injuries. Under gas-oxygen and ether anaesthesia the fragments of the ulna were brought into alignment, the wounds loosely sutured, and small drainage tubes put in position. Antitetanus serum was given.

On the afternoon of Aug. 29 the patient's temperature shot up to 103° F. and his pulse rose to 90. On the following morning the right upper arm in its lower third and the right elbow region were found to be brownish red in colour, swollen and painful, and from the wounds there was oozing a dark foul-smelling discharge. Anti-gas-gangrene serum was given—all we held ourselves and some borrowed from another hospital, a total of 20 c.cm. The surgeon in charge of the case opened the wounds extensively, made multiple incisions in the infected area, and freely applied hydrogen peroxide. The surgeon, in consultation with his colleagues, decided against amputation because of the rapid spread of infection and the attendant deterioration in the patient's general condition.

By the afternoon of Aug. 30 it was distressingly obvious that the treatment was going to be of no avail. By evening the infection had spread up the arm to involve the pectoral and upper scapular muscles. Crepitus was easily palpable throughout the affected area. The patient was restless and anxious and the prognosis could not have been worse. The senior house-surgeon, Dr. D. M. Mackechnie, decided to try the effect of pure oxygen on the infected tissues. An ordinary intravenous needle was fixed to the end of a thin rubber tube, the other end of which was attached to the outlet valve of an oxygen cylinder. I got the patient under ether anaesthesia while my colleague thoroughly infiltrated with oxygen the whole of the upper arm and the affected areas on the chest and shoulder. Oxygen was also injected into apparently still healthy tissues ahead of the advancing and well-marked line of demarcation. The existent swelling was accentuated by the blowing up of the tissue with oxygen.

On the morning of Aug. 31 we could hardly believe our eyes. The skin over the chest and shoulder was practically normal in colour, while on the upper arm it had improved considerably in appearance; obvious swelling had gone from the shoulder and chest and was subsiding in the arm. There was no tenderness on pressure on the chest and shoulder and very little discomfort in the arm. Round the elbow-joint there was no change in appearance and swelling, though the stench did not seem to be so overpowering as previously. There was still some crepitus here and there in the chest, shoulder, and arm, but whether from oxygen or anaerobic action it was impossible to say.

The improvement, local and general, was as dramatic as had been the onset and spread of the gangrene. On Sept. 1 the surgeon amputated the arm slightly above mid-humerus. No attempt was made to form a flap or to trim the stump, which was loosely covered with dressings soaked in hydrogen peroxide. Two or three days later the bone stump was trimmed and a flap fashioned. The patient made an uneventful recovery thereafter.

It seems to me that the use of oxygen as described above in the treatment of gas gangrene is reasonable and logical, though I personally would not have thought of getting at the anaerobes in a manner which proved so devastating to them. The anti-gas-gangrene serum given and the recognized surgical measures taken as soon as gas gangrene was suspected did nothing to arrest the alarming spread of the infection. On the other hand, it proved beyond any shadow of doubt to all those concerned with this case, that the gas gangrene was not only arrested but cleared from heavily infected tissues by the intramuscular administration of oxygen.

One cannot, of course, suggest that all other cases of gas gangrene would react so dramatically and so satisfactorily to the same treatment. During the past ten years I have frequently described this case to professional colleagues. Some listened with apparent interest, others with obvious disbelief. Now, it may be that this method of treating gas gangrene has been tried out by others, but I have never read of it, nor have I met any medical man who has heard of its having been used.—I am, etc.,

N. M. MACDONALD,  
R.A.F.V.R.

### Cause of Silicosis

SIR,—In letters appearing in the *Journal* (1937, 1, 195, 474) I gave hypothetical reasons and suggested *modus operandi* permitting a conclusion that the cause of silicosis might be physical in a mechanical sense rather than chemical; in short, involving the laceration of pulmonary tissue as a result of the sharpness of the particles inhaled.

Recently indirect evidence (Cantor Lecture, Royal Society of Arts, 1943) has been forthcoming which appears to support such a mechanical causation—namely, the work of H. V. A. Briseoe and others indicating that the destruction of weevils by inorganic dust is due to the physical characteristics of sharpness and relative smallness of the particles. There appears to be a clear identity in the two cases—(a) human lungs and (b) weevils—as regards the *modus operandi* of sharp particles. This identity is: continued movement of the respective tissues relative to and under the sharp particles continuously present. It is known that such movement exists in the human lung both before and after arriving particles have lost their own momentum. It seems probable there is continued subparticle movement of cuticle in the case of weevils. This probable identity is extremely significant as indicating the possible mechanical cause of silicosis. While the laceration consequent on the weevil cuticle being drawn to and fro under numerous cutting points would explain certain data in the case of weevils, in the case of silicosis such parallel lacerations in the human lung might readily admit the finest particles with certain (possibly chemical) reactions as effects of the mechanical cause of silicosis.—I am, etc.,

S. C. BLACKTIN.

### Service Medicine?

SIR,—The enclosed extracts from a letter I have received from a colleague in the Forces so accurately express the views of many serving members of our profession that I feel it should receive wider publicity. I would be grateful, therefore, if you would find room for them in the *Journal*, as we doctors here would prefer them to be published in your paper.—I am, etc.,

J. A. VALENTINE.

\*\* The extracts, after some further abridgment, are printed below:

"... The first premise to what I want to say is so important as to be almost the foreground of the picture: It is that the civil 'front' carries far heavier burdens in feeding, comfort, transport, and relaxation (especially alcohol) than the Services, inasmuch as I have seen them, and yet is far worse off for doctors. This is bureaucracy's passion for over-staffing. Here, for 500 beds (and we have never yet had 300 occupied), there are 15 doctors (not all fit to practise, of course). True, we have out-patient work to do; true, we might have had heavy casualties, necessitating 48 hours' work on end, perhaps; true, it is the Tropics and lethargy is rife. But I doubt if any of us does more than two afternoons per week, most are ready to go home by 12.30 p.m. (we start at 9.30 a.m.), and I am almost certain that one man has never left the hospital later than 12.30 p.m. in 18 months. Another leaves at 12.45 p.m. regularly

nd writes his private letters in his office during the morning. For  
ae, work has increased, but my average attendance per day for the  
months ended Aug. 31, 1943, beat my previous records and yet  
did not reach 4 patients a day.

"So much for over-staffing. Now about bad staffing. In this  
rea there are two men with M.D., M.R.C.P., yet our medical  
specialist is a G.P. and admits freely that he is not up to the level  
of consultant work. Elsewhere there is a specialist in another branch  
(not medicine nor mine) with 15 years' experience on his honorary  
staff at home; the man who practises this specialty in the hospital  
is painfully ignorant, and even I can teach him his job in respect  
of something that he claims to know and I need not. In fact, his  
reports are a waste of good paper. But the other man is not  
appointed to practise his specialty, and so he gets none of the one  
thing he really can do. And that has been so for 18 months.

"This is the background against which to see my attitude to the  
idea of a State Medical Service. I have seen too much of a bureau-  
cracy in medicine in the last 44 years to have any hope of respecting  
the body that, because it pays me, claims to direct my treatment  
of patients. I am convinced that a State Medical Service will lead  
to precisely the same difficulties in the course of time that jirk the  
genuine doctor who happens to be in the Services. These 44 years  
have shown me that bureaucracy puts importance first on paper-  
work, next on the staff, and last of all on the patient. It has been  
said that 'it does not matter if a patient dies so long as he dies in  
red ink.'

"Here is a fact which, to my mind, typifies the complete  
antagonism of a bureaucracy to the system of apprenticeship—which  
has always been, and fundamentally still is, the real high-light of  
medical training. Every C.O. (even if it is only an executive officer)  
renders confidential reports on his officers, even the doctors; bad  
reports must be shown to the officer concerned. But a medium  
report, or a good one, or one that 'damns with faint praise' must  
not be so shown. So it boils down to, 'Never encourage your  
juniors.' How false to the whole atmosphere of training in the  
learned professions! And how true to the type that knows, as the  
lower civil servant does, that his authority is not from within and  
by virtue of professional respect but from without, like a uniform  
bought from a tailor. This fear of encouraging the junior extends  
to almost active attempts to stop the research-minded from further  
progress. It is markedly helped by the passion for 'put it on paper  
and submit it properly,' and further aided by the distance that  
exists between the controlling power and the patient. This distance  
is less geographical than spiritual. The men who 'run' the politics  
of civilian medicine are in touch with doctors who work and/or the  
patient; of the men who run a bureaucratic medicine few would  
know at which end of the patient to start!

"And from my own personal experience I can substantiate the  
things I have said here. Of equipment, the less said the better;  
you know my views, and in a S.M.S. we shall certainly have  
to indent in duplicate and wait a month to get a new Graefe  
knife, and we shall have to prove that the old one is unserviceable.  
I still have a pitiful supply of apparatus, surgical instruments, and  
even sutures, and the authorities do nothing, so I have to use my  
own and even to buy fresh for myself; this after 18 months. I  
protest vigorously (but who can hear my protests?) against the  
reorganization, nay re-creation, of medicine while the vast majority  
of those whom it will affect chiefly are muzzled in the Services.

"Lastly, is not medicine now more advanced towards the com-  
munity ideal of service for others than any other section of the  
community? Can any other section show such a degree of pro-  
gressive spirit and such an amount of progress made towards ser-  
vice as medicine? I think not. But because we are the most  
easily browbeaten, the busiest, and the least organized, we have to  
be the 'Aunt Sally.' How I sigh to be back home again and  
enmeshed in the worries (but worth-while worries) of civil practice!  
Here it's petty politics, lobbying, back-scratching, and form-filling  
all day long."

### India's Population Problems

Sir.—Before deciding that the medical profession should  
advocate the extension of birth control in India as a contribu-  
tion towards an improvement in the living conditions it is  
essential to decide what are the economic factors producing  
the extreme poverty and danger of famine under which the  
masses live. It is saddening to see in the correspondence on  
this subject so many supporters of the Malthusian doctrine  
that increase in population tends to outrun the food supply.  
Prof. Blacklock concluded his article by giving support to this  
belief. Although he mentioned that Henry George emphatically  
denied the theory, yet by a misinterpretation of a statement  
by George he claimed that the great economist was in doubt  
as to the effect of an increase in population. To anyone who  
has carefully read George's book *Progress and Poverty* it must  
be obvious that he was convinced that increase in population

not only does not lessen but, in fact, increases the average  
wealth per head; indeed, so clear and logical are his interpreta-  
tions of the known facts that it is impossible not to be  
convinced of their correctness. Wealth in any form is equivalent  
to food, since it can be exchanged for this commodity on the  
world's markets. It follows logically that the greater the  
population the more remote should be the danger of poverty  
and famine.

The essential condition is access to the gifts of Nature,  
embraced in the term "land," without which no wealth can  
be produced. Under the present well-nigh universal system  
of land monopoly this access is denied or is granted only on  
payment of such a toll in rent as leaves the actual producer  
the bare minimum for subsistence. Under these conditions no  
reserve of wealth can be built up by the labourer, and in  
countries such as India a bad harvest must therefore result in  
famine, unless there is an organized distribution of food at  
the expense of others. In this country the same system pro-  
duces recurrent industrial depressions with millions of unem-  
ployed, who would starve unless maintained at the expense  
of others.

The discovery and proof by George of the cause of these  
evils and their remedy by the taxation of land values is, in  
the science of economics, as important as the discovery of  
the bacterial cause of disease by Pasteur was in medicine.  
It has met with unscientific criticism similar to that with which  
Pasteur's work was greeted, and unfortunately is even now  
recognized only by a small minority of people, although in  
the 60 years since its publication no valid objections have been  
forthcoming. Economics is still treated as an art rather than  
as the exact science which Henry George showed it to be,  
and such measures as the regulation of the rate of reproduction  
as a solution for the evils of poverty, unemployment, and  
famine are akin to the philosopher's stone in that they are  
based on beliefs which have been proved false. They are  
therefore as likely to be successful as was the search of the  
alchemists.—I am, etc.,

St. Andrews, Fife.

H. A. HANTON.

### Consultant and Specialist Services

Sir.—We find ourselves in sympathy with Mr. Hamilton  
Bailey and with Mr. H. J. McCurrich in their distrust of the  
uncertain and dimly lit path which is apparently being prepared  
by the Royal Colleges for the consultant and specialist. The  
light shed on it by the Presidents in your issue of Jan. 15  
was but a fitful flicker, serving only to perplex and mystify  
those of the profession who, like ourselves, are not at present  
in touch with what might be termed "medical politics." Glimpses of mysterious comings and goings, of esoteric meetings  
and plannings, are vouchsafed to us from time to time, but  
serve only to increase our unease.

With all respect, Sir, may we suggest that the Royal Colleges  
are not the most suitable bodies to deal with the question?  
We venture to doubt if they indeed possess the necessary  
statutory power to draw up standards for, and to prepare a  
register of, consultants (which seems to be the object ultimately  
to be attained). The General Medical Council presumably has  
such power, is representative of all professional interests, and  
is universally respected as an entirely fair and unprejudiced  
body. If a register of consultants and specialists is to be  
prepared, and criteria laid down to be fulfilled by those who  
in future wish to take up such work, we submit that the General  
Medical Council is ideally fitted for the task, and is, indeed,  
the only proper tribunal to undertake it.—We are, etc.,

J. R. FORBES, M.D., M.R.C.P.  
Surgeon Lieut.-Cmdr., R.N.V.R.

H. R. I. WOLFE, F.R.C.S.  
Surgeon Lieut.-Cmdr., R.N.V.R.

### Intelligence and Season of Conception

Sir.—The following objection to Surg. Cmdr. Fraser Roberts's  
arguments (March 4, p. 320) seems to me to be a fatal one.  
Intelligence is by no means the only quality alleged by Fitt  
and others to vary with the season of conception. On the  
contrary, to quote from your own columns (Sept. 5, 1942,  
p. 284): "Those conceived during the period autumn-winter  
are on the average slightly taller, heavier, stronger in hand-grip.

and more intelligent than their fellows, as well as *less likely to die during the first month of neonatal life*" (my italics). Hence Fraser Roberts must show either that high intelligence is usually combined with exceptionally good physique or else that good physique also, and independently of intelligence, leads its possessors to beget children in autumn and winter.

Meanwhile those intelligent and well-informed people who want to have big, strong, intelligent children (and who are prepared to put up with the hearty handshakes) will continue to try to beget them between August and January.

It may be worth while to note in passing that if, after all, it is the season that influences intelligence, then, as this information becomes moderately accessible, intelligent people will be the ones to apply it. They will thus make their hereditarily intelligent offspring even more intelligent, and so, secondarily, intelligence will influence the season too. There will in fact be a "virtuous circle."—I am, etc.,

Medical School, London Hospital;

W. J. PENMAN.

## Obituary

SIR DAVID PRAIN, C.M.G., C.I.E.,  
LL.D., M.B., F.R.S., Lieut.-Col., I.M.S. (ret.)

We regret to record the death on March 16, at Whyteleafe, Surrey, of Sir David Prain, the eminent botanist.

Born in Scotland on July 11, 1857, David Prain was educated at the Parish School, Fettercairn, the Grammar School, Aberdeen, and the Universities of Aberdeen and Edinburgh, where he took the degrees of M.A., M.B., and C.M. After acting as demonstrator of anatomy in the College of Surgeons, Edinburgh, and at Aberdeen University, he entered the Indian Medical Service in 1884, and three years later was appointed curator of the Calcutta Herbarium, succeeding Sir George King in 1898 as superintendent of the Royal Botanic Garden, Calcutta, and director of the Botanical Survey of India. From 1887 onwards during his service in India, Prain published a constant stream of scientific papers, mostly botanical, with a few on other subjects, such as his articles on the Angami Naga tribe, the hot springs of the Namba Forest in Upper Assam, and the fauna of Narcondam and Barren Island. His methods and foresight are illustrated by the somewhat unusual way in which he distributed his reprints: instead of sending these out separately, he retained them for a series of years, finally issuing them in two volumes, *Memoirs and Memoranda* (1894) and *Botanical Notes and Papers* (1901). These included papers on the floras of the Andaman, Nicobar, and Laccadive Islands, and on the races of wheat and the mustards cultivated in Bengal, in addition to many descriptions of new plants and revisions of genera. From 1895 to 1905 he was professor of botany at the Medical College, Calcutta, and he was also a trustee of the Indian Museum (1898-1907) and secretary of the Board of Scientific Advice for India (1903-4). The honour of C.I.E., conferred on him in 1906, was a fitting recognition of his services to Indian science in general and to botany in particular.

The second period of Prain's career coincided with his term of office as director of the Royal Botanic Gardens, Kew (1905-22), where he added to his reputation as a prudent and successful administrator, receiving the C.M.G. and a knighthood in 1912. Though his official duties left him but little leisure, he was able to continue his botanical researches, among which may be mentioned an account of part of the large and difficult family Euphorbiaceae for the *Flora of Tropical Africa*. During his period he served on the councils of numerous scientific societies and institutions, including the Linnean Society (president, 1916-19), Royal Society (treasurer, 1919-21), and John Innes Horticultural Institution (chairman, 1904-34), and was president of the Association of Economic Biologists (1919-21).

His retirement from Kew in 1922, at the age of 65, meant for Prain merely a change of work. He became successively director of Forest Products Research (1922-5), chairman, Animal and Plant Products, Imperial Institute (1926-35), and reasurer of the Ray Society (1932-5). The wide range of his interests was reflected in his presidencies of the Gilbert White Fellowship (1921-4), Imperial Botanical Conference (1924),

Quekett Microscopical Club (1925-7), and Essex Field Club (1930-3). Perhaps the most important botanical publication of his later years was a monograph on the Asiatic species of yam (*Dioscorea*), prepared in collaboration with Mr. I. H. Burkill.

Among the honours conferred on Prain were the Barclay Medal of the Asiatic Society of Bengal (1909), the Linnean Medal (1935), the Albert Medal of the Royal Society of Arts (1925), and the Victoria and the Veitch Medals awarded to him by the Royal Horticultural Society (1912 and 1932).

H.H. THE MAHARAJA OF GONDAL, G.C.S.I., G.C.I.E.,  
LL.D., D.C.L., M.D., F.R.C.P.Ed.

His Highness Bhagvat Sinhjee, Maharaja of Gondal, who has died in Bombay, was one of the most remarkable men in India. He was born on Oct. 24, 1865, son of Thakore Saheb Sagramji of Gondal, had his early education at the Rajkumar College, Rajkot, and was elected a Fellow of the University of Bombay in 1885; then he risked the loss of caste and kingdom by crossing the sea to study medicine at the University of Edinburgh. He graduated M.B., C.M. in 1892; in 1895 he proceeded to the M.D. and was elected F.R.C.P.Ed. In recognition of his intellectual gifts, his wide learning, and his services to the State over which he ruled the Maharaja received the honorary degrees of D.C.L. from Oxford and LL.D. from Edinburgh, and the Royal Society of Edinburgh elected him a Fellow in 1909; he was also a member of the Royal Astronomical Society and of other learned bodies in Great Britain and Ireland. Soon after his accession in 1885 he abolished all taxes in Gondal, and that State, which is the healthiest as well as one of the best ruled in India, has been run largely on the revenue of the railways built by him. In 1935 he followed the old Rajput custom of celebrating his jubilee by giving away his own weight in gold to charities. His publications included the *Journal of a Visit to England*, a *Short History of Aryan Medical Science*, published in 1895 and dedicated to his teacher Sir William Turner "in cherished remembrance," and a two-million-word dictionary of the Gujarati language, which took him 10 years to compile. The Maharaja was created K.C.I.E. in 1887, G.C.I.E. in 1897, and G.C.S.I. in 1937.

F. L. ANGIOR, O.B.E., M.R.C.S.

Dr. Frederick Leigh Angior of Wigan died in Stanley Hospital, Liverpool, on March 14, at the age of 74. He was born and educated in Liverpool, and after qualifying in 1896 joined his elder brother in practice at Wigan 48 years ago. Dr. Angior was elected a member of the B.M.A. in 1898 and took a very active part in the local work of the Association, serving for several long periods as hon. secretary of the Wigan Division and as chairman in 1929-30. He received the O.B.E. for the manner in which he carried out the duties of senior medical officer to the Wigan Division of the British Red Cross Society during the last war.

A colleague and personal friend writes:

The death of Dr. F. L. Angior brings to an end the long period of self-imposed and self-sacrificing service which he rendered on behalf of his fellow practitioners in all medical affairs in the Wigan area. For over thirty years he had been secretary of the Wigan Panel Committee and for over twenty-five years he was the honorary secretary of the local Division of the British Medical Association. He had served on the Wigan and Lancashire Insurance Committees and was secretary of the Local Medical War Committee.

Dr. Angior was of commanding appearance, always well groomed with an old-world charm of manner and an urbanity and kindness of nature that made him the ideal person to undertake the various honorary duties he so ably performed. He attended his many meetings regularly and punctually, and even his holidays were chosen to coincide with the Annual Representative Meetings of the British Medical Association. By his assiduous attention to the details of the work he acquired a store of knowledge on all matters relating to the profession and was ever able, and willing, to help, from his ripe experience, any practitioner who desired advice or information. He was always accessible, ever friendly, and endowed with a keen sense of humour, while his hearty and infectious laugh made everyone feel at home with him. His broad sympathies, his tact, wide culture, and profound knowledge of human nature helped, in great measure, to bring about a happy and contented brotherhood in Wigan, where for years the practitioners have worked in harmony.

Dr. Angior's sense of duty was high. He was aware for some time that he was a very sick man, and, without doubt, had not the



present war arisen, with its increased work and responsibilities, he would have taken the time to have his condition investigated at an earlier date than he ultimately did. He chose, however, to work on, and died practically in harness, leaving a sense of deep loss in the hearts of his colleagues, who, one and all, feel the sincerest sympathy for his elder brother, Dr. T. M. Angior, with whom he has worked in happy partnership for nearly fifty years. Almost all Dr. Angior's time in recent years was given to his professional duties and honorary appointments, but he had a life-long interest in music and dramatic art. He was a Freemason of many years' standing. In his daily life Dr. Angior embodied qualities expressed in phrases he knew well—he was "courteous in manner, easy of address, steady and firm in principle." His place in Wigan, both socially and professionally, will be very hard to fill, but he suffered much and has earned his rest. *Ave atque vale.*

J. O.

On Feb. 27 VIVIAN E. RIDWOOD, B.A., M.R.C.S., L.R.C.P., died at his home in Woodford. He had practised in Bethnal Green for 35 years, except for a period during the last war, when he served over-seas as captain in the R.A.M.C. He had been M.O. to the Post Office and was an examiner for Air Force Cadets and M.O. to the Pioneer Corps, and from 1938 to his death was the London University representative on the Hackney and Spitalfields Exhibition Foundation. But it was as a physician in the districts of Bethnal Green, Spitalfields, and Shoreditch that Dr. Ridwood was best known. He had a large practice in this poor and crowded industrial district, and was much loved for his cheerful presence and his unfailing courtesy and attention to all his patients. He died after a few months of great pain, borne with wonderful cheerfulness and exemplary patience. A memorial service at St. Philip's, Bethnal Green, was very fully attended by his late patients. He will be missed by his fellow practitioners, to whom he was always a good friend.—H. C. D.

The Ashton-under-Lyne district has sustained a severe loss by the death on March 6, after a short illness, of Dr. W. H. HUGHES. He was 79 years of age, was at work to within three weeks of his death, and was the oldest medical practitioner in the area. William Hugh Hughes graduated M.B., C.M., and B.Sc. at Edinburgh in 1889 and also studied at Guy's Hospital and Vienna. In addition to private practice in the town for over fifty years he had served as examining factory surgeon, surgeon to the Borough Police, and honorary and consulting surgeon to the District Infirmary for a commensurate period. He joined the British Medical Association in 1902 and represented his Division at the A.R.M. held in London in 1917.

News has been received of the death on Feb. 19 at Fort Rosebery, Northern Rhodesia, of Dr. S. JEAN MEIKLEJOHN, founder of the Chilubi Hospital and of the Leper Settlement at St. Margaret's. She graduated M.B., Ch.B. at Aberdeen in 1906, was Carnegie Research Fellow in 1912-13 and John Lucas Walker Student 1913-15, and for a time was medical officer to the Dunfermline College of Hygiene and Physical Education. Dr. Joan Lamplugh sends the following appreciation: At an age when most people are content to retire and occupy their leisure with hobbies, Dr. Jean Meiklejohn launched into the strenuous and difficult task of being the pioneer doctor in the White Fathers' Mission at Bangwulu in Northern Rhodesia. She went to Chilubi Island, which lies on Lake Bangwulu on the edge of the swamps where Livingstone died, and in 1937 founded the Hospital of St. Joan of Arc at Santa Maria Mission. The nearest hospitals were each three days' journey by canoe, bicycle, and mail lorry, and for sick Africans without such facilities the journey would have taken very much longer, so the hospital met an urgent need. Working among a primitive and difficult people, with lack of money and materials and skilled help, she nevertheless built up a hospital second to none of its kind. A severe thecal whitlow which she had to open herself without anaesthesia disabled her from operating, and was the occasion for another doctor to join her. From then onwards she concentrated on the leper work and undertook a survey of leprosy in the Bangwulu lake region. The expansion of the work at Chilubi made it necessary to move the lepers from that overcrowded island, and in 1942 she founded a leper colony on the north shores of the lake at St. Margaret's, Kasaba. She was undaunted by the arduous conditions of bush life, and cheerfully undertook supervision of the building of the new colony from the time when the first vegetables in the garden were not yet ready and the timber for the houses not yet cut. She lived for some time in a native hut, and there, as elsewhere, maintained that atmosphere of exquisite taste and civilized living which she carried round with her even when she was living under canvas. She was a painstaking, methodical, and exact clinician and tireless in the treatment of cases under her care. Although when speaking of the surgical needs of Chilubi she complained that she was

"too old a dog to learn new tricks," yet she did in fact become very skilled in leprosy work. She took a long view of the work and was keen on everything that could benefit her lepers, down to the smallest detail of building and gardening. She left the impression of her gracious personality on everything she touched; her loss is all but irreparable and will be most deeply felt by her lepers, to whom she was unfailingly kind. War conditions make the search for a successor an almost hopeless task. She died of blackwater fever.

Dr. A. Griffiths Farr writes from Tanganyika Territory: I have only just received news of the death of FRANCIS WILFRID WILLWAY in a personal letter from home. His obituary notices will, I am sure, have paid due attention to his work in the written art of surgery no less than to his work on the practical side, which was latterly concerned mainly with neurosurgery. They will also have drawn attention to his great organizing ability, to which the citizens of Bristol owe a great deal. It was my privilege to be in contact with F. W. W. for four years as a student and houseman. I shall never forget his teaching, whether by the bedside or in the lecture room; it was clear, logical, concise, and so amazingly complete and delivered so well that it was impossible to forget the main points made. His treatment of patients and of the patient's feelings was admirable and was an object lesson to all. Indeed the closing years of his life were a remarkable example of strength of will and tenacity of endurance. Often in severe pain he continued to work at a phenomenal pace, nor did he neglect, as he might so easily have done, the tuition of students. In his early death medicine has lost an able son and the world a fine citizen.

A correspondent writes: The death of Mr. ARTHUR DONALD GRIFFITH (tributes to whose work and character appeared in the *Journal* of March 18) will be regretted by a wide circle of London colleagues and patients. For a long period he served on the council of the Medical Defence Union, of which he was at the time of his death one of the senior members; on all matters connected with his specialty, as well as on other topics, his opinion was always greatly valued by his colleagues. Stricken recently by an inoperable form of malignant disease, he was able to talk of the inevitable result with a kind of wry humour; this did not conceal the fortitude with which he faced his misfortune. A high-minded as well as an efficient surgeon, his death leaves London the poorer by the loss of one who held a well-deserved place in the affection as well as the esteem of his fellow workers.

*Correction.*—We regret that through a mistake in the card index the last sentence of the obituary notice of Sir Norman Gray Hill (March 25, p. 438) was erroneous. He was unmarried, and therefore left no widow.

## Medico-Legal

### RESPONSIBILITY AND CULPABILITY

At a joint meeting of the Medico-Legal Society with the Section of Psychiatry of the Royal Society of Medicine a paper was read by Dr. W. NORWOOD EAST on responsibility and culpability.

Dr. East said that the psychiatrist was concerned in court with the defendant's fitness to plead, and with the question whether, if he was fit to plead, he had suffered when the crime was committed from a defect of reason due to disease of the mind which prevented him from knowing the nature and quality of his act or from knowing that it was wrong (the M'Naghten rules). The establishment of sanity or insanity on arraignment offered relatively little difficulty, and medical criticism was reserved for the criteria of irresponsibility laid down in M'Naghten's case. The law, however, was elastic, and Dr. East had no doubt that the present procedure and practice resulted in justice to the public as well as to the offender. If a medical formula of criminal responsibility were introduced, the law might insist on a rigid adherence to its specifications, with resulting hardships to offenders and embarrassment to psychiatrists. The urgent need to-day was rather for an improvement in the quality of the evidence given by forensic psychiatrists. Such evidence sometimes stultified itself because the witness allowed an emotional distaste for the legal restrictions concerning responsibility to overcome his scientific judgment. This could not help justice, defendants, or psychiatrists. Medical witnesses would contribute more to the common good by leaving tests of responsibility to the lawyers, and themselves considering more closely the various mental conditions which might properly be regarded from the medical point of view as lessening culpability. No amendment of the law must weaken the defence of the community; nor could the scientific study of criminals always produce exact results.

A convenient classification separated offenders into six main groups: normal, subnormal, mentally defective, psychopathic, psychoneurotic, and psychotic. The conclusion that normality was indefinable was not so sterile as it might appear and might avert mistake in diagnosis. Everyone had his own base-lines of thought, mood, and behaviour, which fluctuated within personal limits. If the fluctuations were dissimilar and excessive, there might be reason to doubt the person's normality. On the other hand, though less violent fluctuations might be evidence of normality, the unfluctuating person was probably fully responsible and therefore punishable. Dull and backward persons formed a large and important class of criminals. They could usually be recognized without difficulty if all the facts were known. There was no reason to consider them irresponsible, but their culpability might well be lessened, as it was in many cases even of high-grade defectiveness.

#### The Psychopath: A Therapeutic Dilemma

The criminal psychopathic personality might be tentatively defined, Dr. East said, as one who was persistently unable to adapt himself to social requirements on account of quantitative peculiarities of impulse, temperament, and character. Medical evidence and ideas might be more precise and practical if the non-progressive cycloid and schizoid personalities were included in this class, which also contained offenders who showed permanent psychic inferiority, temperamental instability, and psychological maladjustment; also the alcoholics, drug addicts, true sexual perverts, and paranoid personalities. Certain criminal conduct might be profitably classified as perversions—analogueous to sexual—of the acquisitive, aggressive, and gregarious instincts. The constitutional inability of the psychopath to harmonize with other persons and situations exaggerated a criminal potentiality. The nearer the condition seemed to lie to mental disease and the further from an anomaly of character, the more inclined would the psychiatrist be to consider whether culpability should be modified. The dilemma of treatment arose particularly in this group. The law might impose a short and ineffective sentence; medically, prolonged detention and treatment might be essential if any possibility of social adaptation were to be exploited. An insufficiently educated public might, however, refuse to tolerate prolonged detention for an offence for which another person might be given a light punishment.

The association of crime with hysteria and anxiety states had probably been underrated and its association with obsessional states overstated. Neurasthenia was occasionally a direct cause of criminal behaviour. Crime was often associated with an early form of psychosis in which the indications of mental disease were so tenuous that the accused had to be adjudged culpable as well as responsible. The psychiatrist might be powerless to prevent a serious crime because the potential offender refused to accept medical treatment and the necessity for his care and control could not be demonstrated with certainty to others. Dr. East deeply regretted the lack of a legal method of dealing with the early psychotic potential law-breaker. This lack, like the neglect to restrict the antisocial and antifamily activities of the alcoholic, was, he thought, a crime of society against itself as well as against the potential offender.

The individual treatment of offenders began with the opening of Pentonville Prison in 1842 and had been continued with the establishment of Borstal institutions in 1908. Some of the proposals in the Criminal Justice Bill, 1938—to establish remand centres and State remand homes for the special medical observation of the young offenders; to permit probation orders to include a provision that offenders who, though not certifiable as insane or mentally defective, were suffering from some form of mental illness or abnormality which was susceptible to treatment might be required to submit themselves to mental treatment; and to introduce sentences of corrective training and preventive detention for special types of offenders—were particularly interesting to psychiatrists. With collaborators, Dr. East had elsewhere recommended the establishment of a special kind of penal institution where research could be carried out into the problems of criminal behaviour and abnormal offenders could be scientifically treated. In conclusion, he said he was confident that the numbers of those whose culpability was modified could be ascertained by investigation, the difficulties of their diagnosis overcome by research, and advances made in the individualization of treatment. For practical purposes the assessment of culpability largely depended upon accuracy of distinction between the inherent constitution of the offender and the results of the impact of disease. The more satisfied the psychiatrist was that a crime was due to faults of character and not to the effects of disease, the more reason would he have to consider the lawbreaker responsible, though he might believe that his culpability was modified.

#### Responsibility and Restraint

The CHAIRMAN (Mr. Roland Burrows, K.C.) observed that a society could survive only if it lived according to rule. The rules of criminal law were difficult to establish and hard to alter and therefore tended to lag behind contemporary opinion. Thus the offender sometimes received much sympathy from persons who were not minded to break the law. Moreover, criminal justice was largely

administered by elderly persons whose ideas were based upon experience of a generation or two ago and who were, *per se*, impervious to later ideas. With the numerical increase of society the importance of the individual offender had grown. An offender was to be treated as irresponsible, the necessary corollary was that he was to be put under some form of restraint—which in itself punishment. For this kind of restraint society must turn to the medical profession. There was much to be said for the proposal to restrict the function of the court to finding guilty or not guilty and to give a separate authority the decision on what should be done with an offender, who should, if possible, be turned into a law-abiding member of society or secluded from it. The duty of sentencing offenders was the most anxious and difficult duty upon the criminal judge.

Brigadier J. R. REES said that the Army had arrived at a fair satisfactory formula for assessing responsibility. No man could be tried by a court-martial if he was found to be insane at the discretion of the convening officer of a court martial if any indication that to do so was wise or necessary. Only about 5% of all offenders in the Army were seen by psychiatrists. Trial was dispensed with only for men who were so defective or psychotic that they had clearly been not responsible at the time they committed the offence and that proceedings could not be held. The Army psychiatrist was in the satisfactory position, by the use of a concise form, of giving expert help to the court as its impartial adviser.

#### The Unconscious Motive in Culpability

Dr. H. CRICHTON-MILLER complained that Dr. East had not gone deep enough but had left the impression that the present system could be adapted to the needs of real justice. The whole concept of motivation had been transformed in the last few years, and the psychiatrist now had to deal with problems of culpability in the presence of unconscious motives which were perfectly clear to him but absolutely hidden from the public and the judiciary. He gave as an example a well-to-do woman shop-lifter who was incurably deaf, was developing a paranoid system, and had been thwarted in her desire for a son by the refusal of her husband to have any more children. She could have been helped, but the magistrate took the view that she ought to know better, and gave her a fairly severe sentence, which could not possibly have benefited her. The idea of temporary irresponsibility must imply the possibility of conduct that could not be treated in the ordinary way. Both psychiatrists and lawyers should clarify the difference between the deterrent and the educational elements in a sentence. He would have agreed with the magistrate who had said, when sentencing the shop-lifter, that he was obliged to do so for purposes of deterrence. Doctors must accept deterrent punishment for their patients, but wholly useless forms of punishment were to be deprecated. Mr. G. R. BLANE WHITE, K.C., pointed out that the Army had no procedure appropriate for many mental cases, and only deterrent sentences could be given. Dr. W. H. SHEPLEY declared that the legal point of view over-valued consciousness and did not give due regard to the unconscious. Delinquents could not be improved except by a person whom they felt to be on their side and to understand them. Only such a person could begin to understand their motives, of which they themselves were largely unaware.

Lieut.-Col. J. E. W. PEARCE said that any major change in law or judicial procedure should be based upon systematic psychiatric studies of antisocial conduct, such as those provided for by the Criminal Justice Bill. To do something to reform an offender must be more useful for society than to put him away for the time being. It might well be contrary to the welfare of society that a persistent sexual offender should be at large, particularly during the early stages of his treatment. The psychiatrist's help began after guilt or innocence had been determined; he should be called upon for expert evidence to assist the court in passing sentence. Psychiatrists recognized that a sharp punishment at the very outset of the delinquent's career was very often efficacious. Punishment based merely upon expiation and retribution had been proved ill advised. For the protection of society punishment must be both deterrent and reformative. A small advisory committee should be set up to prevent waste of time in overlapping research into delinquency. Some of the arbitrary age limits—e.g., the presumption that a boy below 14 could not have carnal knowledge—should be swept away. Dr. ROWLAND HILL stressed the difficulty of distinguishing between a psychopath and a healthy person who had been brought up in an abnormal environment. Many habitual criminals had an abnormal childhood. The domiciliary service of supervision and control of antisocial people should be enormously extended, and the care committee might well have a large number of voluntary workers associated with it to relieve the pressure on the overworked probation officer.

Dr. NORWOOD EAST, in reply, warned against too rapid an introduction of deep explanations of crime, which might much offend the public and hamper the development of suitable methods. Doctors should study minor mental abnormalities more closely. The provisions of the Criminal Justice Bill would give a great impetus to the medical profession to help in the treatment and deterrence of crime.

## Universities and Colleges

### UNIVERSITY OF EDINBURGH

brigadier F. A. E. Crew, M.D., D.Sc., F.R.S., has been appointed to succeed Prof. P. S. Lelean in the Bruce and John Usher chair of public health. He has held the Buchanan chair of animal genetics in Edinburgh since 1928 and was temporarily released from the duties of his professorship some two years ago for work in the Medical Department of the War Office.

### UNIVERSITY OF GLASGOW

A series of meetings will be held in the Department of Ophthalmology on Wednesdays, from April 5 to May 10, at 8 p.m. The meetings are open to all medical practitioners and senior students interested in ophthalmology.

### UNIVERSITY OF LEEDS

At a meeting of the Council of the University of Leeds on March 14, part-time Lectureship in Public Health was instituted, and Dr. F. R. Dennison, honorary demonstrator in that subject, was appointed to be the new post.

### UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

**FINAL M.B., Ch.B.—Part I:** Audrey M. Ashcroft, N. L. Bailes, K. Baker, J. Beacon, D. T. Burns, P. Brealey, P. M. Breidahl, Helen A. Carson, V. D. Charnley, M. H. Clark, J. N. Coulshed, S. Croft, G. D. Currie, Pauline M. Dean, Joan Evans, R. L. Goldson, H. G. Graham, J. E. A. Harris, Ailsa M. Heath, Nellie Hughes, J. F. G. Ince, R. W. Kennon, Barbara M. Kulick, C. S. Law, Jean Leary, D. C. Levinson, H. S. Levy, T. R. Littler, H. A. P. Garra, A. E. Pritchard, Rachael M. Rawcliffe, G. P. Reed, H. Roberts, W. C. Roberts, P. W. Robertson, F. W. Sheffield, H. H. Slack, Helen M. Taylor, L. Temkin, R. G. Thomas, Maureen M. Tickle, H. F. Tinker, Ward, Joyce Watson, J. N. P. Watson, W. F. Wille, E. H. Wilson, E. Wren, Aline N. Wynne, *Passed in Separate Subject:* Cécile N. Broster (Pharmacy and General Therapeutics). **Part II:** M. K. Alexander, J. T. D. Allen, E. T. Anderson, Beril G. Anson, G. Ansell, K. W. Baruch, J. P. D. Bates, J. J. Boag, Edna M. Brown, D. Craddock, H. T. Davenport, B. Dover, Monica Driskill, E. D. Edmondson, J. L. Edmondson, J. W. Edwards, R. E. Ham, P. Foster, J. J. C. Frew, B. R. Frisby, J. D. A. Gregson, R. Griffiths, B. B. Harrison, C. R. Helsby, G. Hughes, L. Jacobs, D. C. R. Jones, E. S. Jones, H. A. Jones, R. S. Jones, M. Kirwan, J. W. T. W. Lawson, J. Joyce, R. Lewis, J. B. Lynch, J. B. McCarthy, M. G. McEntegart, C. H. Martlew, Lucille F. Morgan, D. B. Mossman, C. M. O'Neill, C. A. Newson, H. H. Philne, Muriel E. St. Pier, W. L. Sanders, J. J. Shepherd, Isabel S. Smellie, J. G. W. Storey, P. J. Taylor, W. A. Thompson, Corris E. Venables, H. Wickham, J. R. E. Wilson, *Passed in Separate Subject:* Lipton (Public Health).

<sup>1</sup> Distinction in pharmacology and general therapeutics. <sup>2</sup> Distinction in forensic medicine and toxicology. <sup>3</sup> Distinction in public health.

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

The President, Sir Alfred Webb-Johnson, gave a luncheon on March 10 at the College in honour of Major-General Norman T. Kirk, Surgeon-General of the United States Army. Those present were: The United States Ambassador; Dr. E. A. Strecher, Consultant to the Secretary of War; Major-Gen. David N. W. Grant, Air Surgeon, U.S. Army Air Force; Major-Gen. Paul R. Hawley, Chief Surgeon, E.T.O., U.S. Army; Brig.-Gen. Malcolm C. Grow, Surgeon, J.S. Strategic Air Force; Col. Elliott C. Cutler, Chief Consultant in Surgery, E.T.O., U.S. Army; Col. James C. Kimbrough, Chief of Professional Service, E.T.O., U.S. Army; Col. Rex L. Diveley, Senior Consultant in Orthopaedic Surgery, E.T.O., U.S. Army; Col. Derrick T. Vail, Senior Consultant in Ophthalmology, E.T.O., U.S. Army; Col. Herbert Wright, Chief of Professional Services, J.S. Strategic Air Force; Surg. Vice-Adml. Sir Sheldon Dudley, Medical Director-General, Royal Navy; Lieut.-Gen. Sir Alexander Hood, Director-General, A.M.S.; Air Marshal Sir Harold Whittingham, Director-General, R.A.F.M.S.; Major-Gen. R. M. Luton, Director, Medical Service, Canadian Forces in England; and seven other members of the Council of the College.

A series of Hunterian Lectures commencing on Wednesday, April 12, and a Thomas Vicary Lecture on Thursday, April 13, will be given at the College (Lincoln's Inn Fields, W.C.). All the lectures begin at 4 p.m. and are open to advanced students and medical practitioners.

### COLLEGE OF PHYSICIANS AND SURGEONS OF BOMBAY

The Council of the College of Physicians and Surgeons of Bombay at its meeting in July, 1943, decided to institute an examination for a diploma in child health (D.C.H.Bom.) and appointed a committee to draw up regulations for that examination. The committee submitted its report to the Council on Jan. 14, 1944, and the report was approved and adopted. The course, which is of twelve months' duration, has to be taken at a recognized children's hospital or in a recognized children's department of a general hospital. The examination is open to persons holding a qualification (a) laid down in Schedules I and II of the Indian Medical Council Act, 1933, or (b) granted by any of the various Examining Boards in India whose names were on the Schedule of the Bombay Medical Council in 1941.

## The Services

Capt. E. T. McCartney, R.A.M.C., has been awarded the M.C., and Major (temp. Lieut.-Col.) P. J. May, M.B.E., Capt. (temp. Major) C. B. Marsden, and Lieut. A. P. Binks, R.A.M.C., have been mentioned in dispatches in recognition of gallant and distinguished services in the field.

Capt. J. A. L. Naughton, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

Surg. Lieut.-Cmdr. E. S. McPhail, R.N.Z.N.V.R., has been mentioned in dispatches for outstanding courage, enterprise, and devotion to duty in H.M.N.Z.S. *Leander* in an action with Japanese Forces.

The following appointments, awards, and mentions in recognition of gallant and distinguished services in Sicily have been announced in the *London Gazette*:

**C.B.E. (Military Division).**—Col. (temp.) A. A. Eagger, O.B.E., R.A.M.C.

**O.B.E. (Military Division).**—Col. (temp.) C. Donald; Majors (temp. Lieut.-Cols.) P. Lloyd-Williams, T.D., F. O'Driscoll, W. A. Robinson, H. L. W. Sixsmith, M.B.E., W. L. Spencer-Cox, M.C., R.A.M.C.; Capt. (temp. Major) E. A. Jack, R.A.M.C.

**M.B.E. (Military Division).**—Capts. (temp. Majors) R. Bolton, L. F. W. Salmon, R.A.M.C.; Capt. H. K. Lucas, R.A.M.C.

**M.C.**—Capts. A. Noble and D. G. Sheffield, R.A.M.C.

**Mentioned in Dispatches.**—Brigs. (temp.) S. Arnott, D.S.O., R. R. G. Atkins, O.B.E., M.C., R. W. Galloway, C.B.E., D.S.O., E. Phillips, C.B.E., D.S.O., M.C., late R.A.M.C.; Cols. (temp.) W. M. Cameron, O.B.E., A. T. B. Dickson, O.B.E.; Major (temp. Lieut.-Col.) (Acting Col.) J. C. Gilroy; Majors (temp. Lieut.-Cols.) A. McC. Campbell, R. McL. Gordon, D.S.O., D.F.C., G.M., F. H. Hollingshead, R. G. M. Keeling, O.B.E., C. H. Kerr, D.S.O., M.C. Paterson, M.C.; Capts. (temp. Majors) J. W. L. Bain, L. Brill, G. C. Dancy-Browning, W. S. Harvey, F. C. Heatley, C. J. Longland, A. J. R. Lowdon, M. M. Medine, M.B.E., C. J. B. Murray, A. D. Wall; Capt. (Acting Major) R. W. Jones; Capts. A. Green, D. C. Little, J. B. MacKay, B. C. M. Palmer, R. Paul, D. R. Sandison, A. L. Thorp (died of wounds), R.A.M.C.; Major (temp. Lieut.-Col.) J. Morgan, O.B.E., I.M.S.

### CASUALTIES IN THE MEDICAL SERVICES

Acting Wing Cmdr. DONALD SCRINGOUR BATEMAN was killed in a flying accident over-seas on March 14, aged 40. He studied medicine at Oxford University and St. Thomas's Hospital, qualified in 1930, and took the M.B., B.Ch. degrees in 1936. He obtained the Diploma in Child Health in 1935 and the M.R.C.P. in 1937. He was appointed to the Medical Branch, R.A.F.V.R., on April 18, 1939, and was called up for service at the outbreak of war. At the time of his death he was physician in charge of the medical division of an R.A.F. hospital over-seas.

Acting Squad. Ldr. HUGH FERGUSON DAVIDSON WHITELAW died on March 15 at the age of 34. He studied medicine in Glasgow and took the Scottish Triple Qualification in 1934. He entered general practice in 1935 and was appointed to a commission in the Medical Branch, R.A.F.V.R., on Jan. 7, 1941. At the time of his death he was medical officer at an R.A.F. Wing Headquarters at home.

Acting Squad. Ldr. EDWARD TUDOR OWEN died on March 17 while on active service over-seas, aged 34. He studied medicine at Liverpool, graduated M.B., Ch.B. of the university in 1933, and obtained the F.R.C.S. in 1941. He held surgical appointments at various hospitals in the Liverpool and Manchester areas and received a commission in the Medical Branch, R.A.F.V.R., on Oct. 8, 1942. At the time of his death he was serving with a mobile field hospital over-seas.

**Wounded.**—War Subs. Capt. B. P. Armstrong and C. M. Boucher, and Lieut.-Col. J. N. Groves, R.A.M.C.; Wing Cmdr. T. D. L. Bolan and Acting Wing Cmdr. C. R. Jenkins, R.A.F.

**Killed.**—War Subs. Capt. J. J. Docherty, R.A.M.C.

**Killed on active service in Burma.**—Capt. H. Lauder, R.A.M.C. Previously reported missing, now presumed lost at sea.—Lieut. N. Jolly, R.A.M.C.

**Died.**—War Subs. Capt. J. S. G. A. Burns and J. Sheehan, R.A.M.C., Capt. H. Mullen, R.A.M.C.

**Prisoner of war.**—Lieut. R. L. G. Dawson, R.A.M.C.

### DEATHS IN THE SERVICES

Col. GEORGE HUTCHESON, I.M.S. (ret.), died on March 14 at Douglas, Isle of Man. His father, George Hutcheson, had entered the Indian Medical Service in 1873 and had written on cholera. George Hutcheson, jun., was born in India on Dec. 17, 1874, and educated at the Brighton and Epsom College and the London Hos-

pital. He passed both the Conjoint Board and the London University final medical examinations in 1897 and 1898 and entered the I.M.S. in the latter year. He saw active service in China in 1900 and received the medal. On entering the civil branch he joined the jail department and held charge of various large central jails; the work of these includes administrative as well as medical charge. He was promoted to the rank of major in 1910 and of lieutenant-col. in 1918. In 1927 he was selected for the administrative grade and was appointed to be Inspector-General of Civil Hospitals and of Prisons, Assam; he retired on completion of his term in that post. He joined the British Medical Association in 1908.

## Medical Notes in Parliament

### National Health Service Debate in the Lords

When the debate on the White Paper was resumed in the House of Lords on March 21, Lord HORDER said he believed that the Government's intentions were honourable, but good intentions were not enough when the question at issue was such an expert one as that of not only maintaining but increasing the national health services. Careful analysis of the White Paper did not convince him that the knowledge and experience that we actually possessed in these matters had been fully utilized in framing the Government's scheme. If the White Paper was only a tentative expression of the Government's ideas of how a national health service might be run and was open to modification after further discussion with those who actually ran these services to-day, his own fears were to a large extent allayed; but if the White Paper as it stood was to be made the basis of an Act of Parliament, discussion being subsequent and not prior to the drafting, certain principles and institutions of paramount importance to the efficiency of our health services were likely to be lost to us. The White Paper posed an administrative structure which threatened the very existence of two of the institutions in British medicine which both past and present experience showed to be vital—the private practitioner and the voluntary hospitals. It was true that it said that both of these institutions were to be allowed to remain, but their continued recognition was not definitely encouraged. It was permissive, and they must fight for their survival.

The attitude of the White Paper towards the man who wanted to continue private practice and yet avail himself of the manifest advantages to his patient that this new scheme offered was too colourless, if not actually negative. Almost it read as though some patients preferred to be doctored privately, and so, as this was still a free country, their whim was to be indulged, for a while, anyway. It was very much the same in regard to the voluntary hospitals. It was certainly not the wish of the Government, the White Paper said, to destroy or diminish a system so well rooted in the good will of its supporters. But this expression of a mere desire for co-operation, this permission to continue to exist, demonstrated a great lack of appreciation of the intrinsic value for the nation of an institution in which there had resided for hundreds of years, and still resided, the best that British medicine held in respect of both its science and its art. The White Paper dismissed medical research in a few lines. It said that it had been the policy of the Medical Research Council to encourage research work in the hospitals and to assist it financially. He agreed that that was a good policy, as against the alternative one of setting up super-State institutions for this purpose.

The voluntary hospitals should have not only permission to exist but positive encouragement and a guarantee of financial security. He shared the anxiety of those who, while recognizing that the Government scheme did not kill the voluntary hospitals, feared that it might quickly starve them into inanition. The Minister of Health said he could not believe that the anxiety shown was really justified. If so, then it was a duty laid upon the Minister to allay this anxiety, because the expression of it had been very real and very general throughout the country. He did not think anyone could say what might be the ultimate type of hospital service in this country, how controlled, how administered, how financed. But most doctors believed it essential to maintain the voluntary hospitals pending the proposed development in the hospital service, whether the view was short or long. Most of them believed that it was not in the best interests of the health of the nation that the medical profession should be a branch of the Civil Service. But what the public believed was more important than what doctors believed. The Government should take some steps to enlighten the public on the real implications of the White Paper before an Act of Parliament was framed in relation to it. If this were done, public opinion would take much the same view as the doctors. Some of them felt, not that there was too much of the spirit

of democracy in the White Paper, but that there was not enough democracy in it. The White Paper smelt too much of bureaucracy.

### The Central Authorities

The principle of professional and vocational guidance appeared to be traversed, in the suggested administrative machinery, at the centre and at the periphery. The Central Health Services Council was not appointed by the profession or by professional organizations. It had no executive power and, presumably, might not publish its reports. The Central Medical Board had executive power, but here again nomination was by the Minister and not by professional organization. In the case of hospitals the anomaly called for special consideration. He was very doubtful if in this case anything short of *ad hoc* hospitals board would resolve the conflict that would undoubtedly face the Minister. Such a board should certainly be set up. Care should be taken to see that the areas chosen for the hospitals and allied services should be large enough to embrace all types of hospital and clinic in close liaison, working always upwards to a key hospital, which should be, whenever possible, a teaching hospital of university status.

He confessed to some surprise when he read the Minister of Health's comment on the cottage hospitals—namely, that the old conception of the local hospital was outworn. He awaited with interest the comments of the admirable boards who ran these splendid institutions. He was convinced that, given proper vocational representation on the controlling and administrative bodies, both central and local, the development of Health Centres would bring about that availability of our health services which was the essence of the problem. In those Health Centres the Government could nourish that spirit of adventure and enterprise which lay at the heart of British medicine, and which the shadow of some parts of the White Paper threatened to obscure. Ministers and the accredited representatives of medicine, by coming together, could make satisfactory adjustments in this suggested scheme. He wished that medicine could offer the Government what he and some of his friends dreamt of but had not so far realized—an Academy of Medicine in this country for these deliberations, a body which would be authoritative, representative, and judicial. But, failing that, there were bodies with which the Government had already made contact, bodies animated by good will and by a desire to do the best in this matter for the people of this country.

Lord GEDDES said it was true that social security did make being ill a gainful occupation, and it was probable that a certain number of people might like to continue in that easy occupation of making an income on the flat of their backs in bed. Therefore there had to be certification by medical people. There was no elaboration in the White Paper of how the consultant service was to be trained and developed, and not very much about how it was to be administered; but one thing was clear, and that was that it was to be administered by, and under the control of, the hospitals and the local authorities concerned. That was an extraordinary position. The general practitioners would be under the control of the Central Medical Board, which was, as he read it, a mainly bureaucratic body controlled by the civil servants of the Ministry of Health acting in the name of the Minister. They were to lay down the conditions of certification as to whether those who thought themselves sick were to be allowed to continue in the gainful occupation of being sick. The general practitioners would have a contract in which were stated the conditions on which they were to certify.

### A Medical Gestapo

There must be certification for any security plan and a medical inspectorate, and if that did not degenerate before very long into something not very dissimilar from a "medical Gestapo" he did not know the way the Civil Service of this country worked. What would happen was that they would have this continual supervision of every person who, on medical grounds, was a beneficiary under this plan. There was no way of escaping that. If they were going to have a security plan with medical benefit on a great scale there must be certification. If it was to be safe, there must be some way for the wage-earners who were caught by the certification to get to independent medical opinion. Therefore he was profoundly disquieted by the suggestion in the White Paper that everybody was to be insured. In the interests of them all there should be an uninsured class of people in the country—obviously in the upper income limit—and they would, of course, pay for the real health service, not this health service through taxes and rates. If they were not insured they would be adequate to maintain a strong body of independent leaders of the medical profession, to whom appeal could be made from decisions of the doctors controlled by the Central Medical Board. That there should be such an independent group of doctors was of the greatest possible importance. The Government should look at that point again; because this

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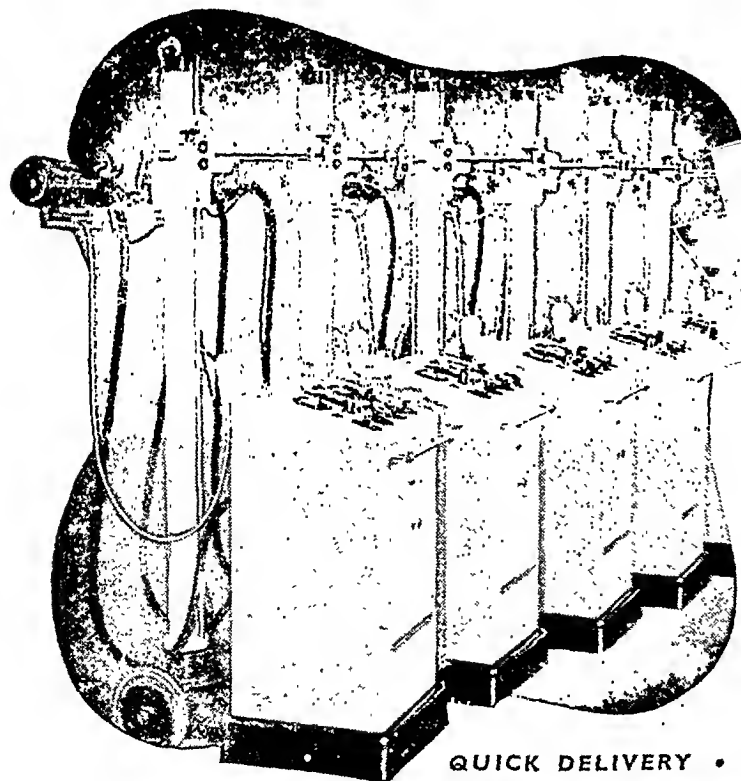


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document was based upon the idea of treatment of ill-health. It must necessarily increase the vested interest in ill-health, because it was raising the amount of money spent on dealing with it.

Medicine was a continually growing science and art, changing year by year under the influence of the great teaching hospitals. They must do their best to keep in the van of medical knowledge, medical research, and medical teaching. That meant that the great teaching hospitals—which would be, which must be, any complete scheme of hospital organization the key hospitals of great regions—must be governed by bodies of men who understood fully what medical research, medical science, and medical teaching meant.

Lord BALFOUR OF BURLEIGH said he was assured that more than 1,000,000 people in this country, drawn from all classes of society, relied upon homoeopathic treatment. He did not fully grasp how the homoeopaths were satisfactorily to be fitted to this scheme.

### "Power of Direction"

Lord WOOLTON, who replied, said that there was no doubt in the mind of the Government about the value of scientific research in general and medical research in particular. He would have a conversation with the responsible Minister with regard to the homoeopaths. The Government had tried, in the development of this scheme, not to destroy but to build up from what they had a new system that would grow out of the old. The concern of Lord Moran and Lord Horder about the Government's relation to the Central Health Services Council and what the Government was going to do with the profession was unnecessary. The Government was most anxious to co-operate in every sort of way with the medical profession, to consult them, and to do everything with them—except one thing. Ministers were determined that they would take the responsibility for their actions, and they were not going to put that responsibility on to a medical board. There was no insincerity in the White Paper. When the Government said, therefore, that it was going to have a "medical council" it was not something merely put up as a screen; it was a deliberate effort to get the best of medical opinion to advise Ministers. The Government did not say, "Here is the legislation; you can take it or leave it." The profession would be consulted throughout before legislation was brought in.

The White Paper contained no proposal in any way analogous to the power of direction at present exercised by the Government under the National Service Acts. The true position was this: there was an assumption by the community as a whole of the responsibility for guaranteeing to every member of it the services of a family doctor. That was what the Government was guaranteeing, and that involved new duties with regard to the distribution of medical practice. The Government must do what it could, without regimentation of the profession, to see that every area had enough doctors to meet the needs of the patients, which was not always the present position. Two proposals were therefore made in the White Paper for methods to be used by the Central Medical Board for this purpose. The first was that the board should be able to say that a particular area already had enough doctors to carry on the public service, and that no newcomers into the public service should be allowed in that area. How restricted this power was and how little it resembled direction, even of a negative kind, was clear from the fact that it did not apply to private practice. Any doctor would be at liberty to practise privately wherever he liked and at any time he liked. Moreover, it applied only to newcomers to an area and did not in any way disturb or affect the doctors already practising there, and it did not involve directing any doctor to go anywhere. It merely restricted the range of his choice of the area in which he would take up practice in the public service. When a young man wished to enter a public service where he would be paid out of public funds, it was not a very hard condition that he should be told where there was a vacancy and where the State was prepared to pay him to do his work. There had been misunderstanding on this point.

The Government did not want the voluntary hospitals to pass. It had deliberately stated that the sum total of the cost of this National Health Service would not be met by rates and taxes or by contributions under the insurance scheme—that all those put together would not be enough to maintain all the hospital services and all the other services that would be required. Therefore it would be necessary for the voluntary hospitals to continue. There was no reason to be fearful on this question. Both by word and deed the Government would do whatever it could to maintain the existence of the hospitals in full vigour.

The Government was anxious to develop a consultative service for the whole community. Before legislation it would enter into the fullest discussion with reference to the position of consultants and the training of consultants. There was in

this country a great medical and hospital service, but the thing the Government had in mind was a programme of positive health for the people. Through this legislation the country would benefit immeasurably, and he hoped that Lord Moran would come in on to the Government side and not divide the House on this question.

Lord MORAN withdrew his amendment, and the motion welcoming the Government's proposals was agreed to.

### Rehabilitation in the Air Force

In the House of Commons on Feb. 29 Sir ARCHIBALD SINCLAIR made a statement on the Air Estimates. Referring to the accident rate he said that though statistics showed that it was declining they were not satisfied.

Every accident represented a lamentable waste, certainly of labour and materials and perhaps of precious life and skill. Moreover, as our aircraft became larger, more lives were risked every time an accident happened. It was our duty to see that each member of a crew, whose lives might depend on any one of their number, was as skilled, practised, and swift in thought and action as training could make him. Another source of wastage which had been reduced was sickness. Though more of our units were serving over-seas, often in unhealthy areas and under active war conditions, we had had, during the last 12 months, fewer sick than at any time since the outbreak of war. That certainly meant much in avoidance of pain and suffering; but it also meant the addition of several thousand men and women to our resources. The R.A.F. owed a great debt to the medical profession, both to those members of it whose career lay in the R.A.F. Medical Branch and to the many doctors and surgeons who had joined it since the war started.

Remarkable strides had been made in the rehabilitation of men suffering from burns, severe wounds, and accidents. The rehabilitation centres worked on the principle that it was not enough that a broken limb or a torn ligament or burnt fingers should be mended if the patient was nevertheless to limp or lose part of his skill of hand for the rest of his days. Members knew the tragedy of industrial cases and the fear that haunted the patient that he would never get back to full work again, and they would be glad to hear that over 80% of the patients in the centres had been able to get back to full duties in a shorter time than a few years ago we should have believed possible. So, under the wise and vigorous leadership of Air Marshal Sir Harold Whittingham, the Director-General of Medical Services, doctors and dentists contrived not only to heal but to prevent sickness, and thus strengthen the R.A.F. for battle.

### Royal Commission on Population

Mr. CHURCHILL announced on March 2 that Mr. Willink had appointed three committees to assist the Royal Commission on Population respectively on the statistical, the economic, and the biological and medical aspects of the inquiry. The secretary of the Royal Commission itself and of the three committees was Mr. N. F. McNicoll of the Ministry of Health. The terms of reference of the Commission were:

To examine the facts relating to the present population trends in Great Britain; to investigate the causes of these trends and to consider their probable consequences; to consider what measures, if any, should be taken in the national interest to influence the future trend of population; and to make recommendations.

The medical members of the Commission are Prof. A. W. M. Ellis, who is chairman of the Biological and Medical Committee, and Dr. Ethel Cassie.

The terms of reference of the Biological and Medical Committee are: To formulate for the assistance of the Royal Commission on Population the biological and medical factors relevant to the Commission's inquiry and generally to advise the Commission on the biological and medical aspects of the inquiry. The members of this committee in addition to Prof. Ellis are Prof. E. D. Adrian, Prof. D. Baird, Dr. P. M. F. Bishop, Dr. C. P. Blacker, Mr. Eardley Holland, Dame Louise McLroy, Dr. A. S. Parkes, Mr. E. W. Riches, Sir Alexander Russell, Dr. Percy Stocks, and Dr. J. G. Thwaites.

### Army Medical Services

Replying on March 2 to the debate on the Army Estimates. Mr. ARTHUR HENDERSON said the Army Medical Service, including the Army Dental Service and Queen Alexandra's Imperial Military Nursing Service, had been strained owing to shortage of doctors. The Army Medical Service had accepted as an additional responsibility the care of Yugoslav wounded. The doctors available were insufficient to meet the needs of the fighting Services and of the civil population. Medical personnel were in many instances unavoidably overworked. They had accepted this cheerfully and with zeal and efficiency, had

surmounted all difficulties, and produced excellent results. Every effort was made to replace medical officers, where possible, by non-medical officers, R.A.M.C., in appointments which could reasonably be filled by persons who lacked medical qualifications. The Army had cut down its demands for doctors to the minimum, but the minimum was unlikely to be supplied. The Army Council would be able to meet the demands of the Forces engaged in future on active operations, but the Army at home would not receive the same high standard of medical service which it had in the past. Every endeavour would be made to see the sick were well cared for and did not suffer. There were bound to be delays and imperfections in medical boards, specialist examinations, the answering of complaints, and other administrative activities which were not matters of life and death. These must be accepted.

#### Rescue Ships of the Navy

In introducing the Navy Estimates in the House of Commons on March 7, Mr. A. V. ALEXANDER referred to the reduction in the loss of shipping tonnage. He said that this reduction had been reflected in the Merchant Navy casualties, and that in 1943 the number of officers and men lost was roughly only half of that in 1942. The Admiralty, in consultation with the Ministry of War Transport, had been able to increase substantially the number of the special rescue ships which were sailed with convoys now for the sole purpose of rescuing survivors and giving medical attention. Each carried a naval doctor and a hospital staff, and they were now an integral part of the convoy system. There had been many reports from the naval escorts praising the high standard of seamanship and efficiency of the masters, officers, and crews of these vessels, which had been operated with magnificent courage.

#### Antibacterial Cream for Burns

In reply to Mr. Kirkwood on March 14 Mr. JOHNSTON said he was informed that Prof. Todd and his assistants at the Royal Technical College, Glasgow, in collaboration with the Glasgow Royal Infirmary, had produced a formula for a cream for use as a skin disinfectant and as a first-aid treatment for burns. Claims recently made for this preparation in the Press went further than those responsible for the formula would desire, but Prof. Todd and his staff had performed a valuable public service in evolving this exceedingly helpful formula. It was described in the *British Medical Journal* for March 4 in a letter from Dr. Leonard Colebrook, who was sent to Glasgow by the Medical Research Council to undertake investigations.

#### Venereal Diseases

Mr. GRAHAM WHITE on March 16 inquired whether the Minister of Health was satisfied with the progress made in dealing with venereal diseases under Regulation 33B, and if he would take further measures to prevent this evil from spreading. Mr. WILLINK said that in his view Regulation 33B had been of considerable help to local authorities in tracing and securing treatment of persons who did not voluntarily seek and undertake it. The Regulation was not designed to do more than deal with a comparatively small class of infected persons who had always been a special problem. He had under special consideration what further effective measures could be taken to deal with these diseases, but was not yet in a position to make a statement.

In answer to Mr. Sorensen on March 14 Sir JAMES GRIGG said that in the years 1940 to 1943 inclusive there were in this country on the average just under 11 fresh cases a year of venereal disease per 1,000 troops. The average figure for 15 to 1918 inclusive was 29½ per 1,000, but these figures included relapses as well as fresh cases. They were not, therefore, strictly comparable with the present figures, but showed that there had been a substantial decrease. Of men discharged from the Army on medical grounds, 3 per 1,000 were discharged on account of venereal disease. Every method in the way of education, provision of recreation, prophylaxis, and treatment was being actively investigated with a view to decreasing wastage from these essentially preventable diseases.

#### Examination of the Eyes of School-children

Mr. BUTLER said on March 16 that in 1938 the number of ophthalmic surgeons employed by local education authorities in the school medical service was 418. Comparable figures for the war years were not available, but he had no reason to think that the number had fallen materially. School medical officers and assistant school medical officers employed by local education authorities on eye work in 1938 numbered 226. The records did not show how many of them had specialist qualifications. Before the Board approved the employment of a school medical officer on eye work they satisfied themselves that he had adequate qualifications and experience.

#### Functions of Ministry of Health

Asked on March 16 to reduce the field of activity of the Ministry of Health to enable the Department to deal with matters of prior importance, Mr. CHURCHILL said that proposals which the Government would shortly make in regard to social insurance would involve reconsideration of the responsibilities of several Departments, including the Ministry of Health. Apart from this and the possibility of minor adjustments in departmental boundaries, he was satisfied that the functions of the Ministry of Health covered a well-defined and manageable field of action.

#### Diphtheria Immunization

On March 21 Mr. WILLINK, replying to Mr. Alfred Edwards, said that the number of cases in England and Wales in which it had come to his notice that death had taken place shortly after immunization by toxoid against diphtheria was two. It was estimated that about five million children had been given protection by this means in the last few years. The number of reported cases in which "nervous trouble" had been noted some time after immunization was 16. The relationship between the nervous trouble and the process of immunization had not been established. Whenever practicable, inquiries were made by medical officers about such cases.

*Malaria Research Institute.*—On March 1 Major LYONS asked whether the Secretary of State for the Colonies would, as an economy effort, establish a malaria research and survey institute for the Central African Colonies, on the lines of the one in India, to be financed by the Colonial Research Fund, or one each for West and East Africa respectively. Mr. EMRYS-EVANS said that research on malaria was being actively carried out at present so far as circumstances permitted. Much work on malaria control had been done and was being done both in East and in West Africa. The general organization of medical research in the Colonial Empire, which would include the most suitable means for investigating the problems of malaria and its control, was at present under consideration by the Colonial Research Committee.

*Allowances for Tuberculous Persons.*—Answering Mr. Graham White on March 2, Mr. WILLINK said arrangements for the payment of treatment allowances in cases of tuberculosis had been made by all county councils and all county borough councils. Special arrangements for meeting the cost of these allowances from the Exchequer were introduced as a wartime measure on the ground of the importance, from the point of view of the war effort, of dealing with certain cases of this disease. Where this consideration did not apply the question of amending existing provision for maintenance was being considered as part of the arrangements for social insurance.

*Women Medical Students' Accommodation.*—On March 7 Sir E. GRAHAM-LITTLE asked the Minister of Health whether he was aware that the Senate of London University desired to extend facilities in its medical schools for women students, but that one of the principal obstacles thereto was the inadequacy of the accommodation for men and women in the university's medical schools, which now trained nearly half the doctors of this country; and whether he would give particular attention to this position in framing his future estimates. Mr. WILLINK replied that he was aware of the resolution on the subject of the training of women medical students recently passed by the Senate of London University, and he understood that a copy of it was being sent to the Committee on Medical Schools, under the chairmanship of Sir William Goodenough. The assistance likely to be needed by medical schools in the future was one of the questions under review by that committee.

*Treatment by Unregistered Practitioners.*—On March 21 Mr. ALFRED EDWARDS asked the Minister of Health whether, when proposals for a national health service were drawn up, consideration was given to the fact that a number of people were treated by unregistered practitioners; and what was the outcome of such consideration. Mr. WILLINK replied that there was nothing in the proposals advanced by the Government which would prevent those who preferred to do so from seeking treatment from unregistered practitioners. The service itself, however, must clearly be based on registered medical practice in the form in which that had so far been approved by Parliament.

*Infant Mortality Inquiry.*—On March 21 Mr. JOHNSTON informed Major Markham that he had asked the Scientific Advisory Committee "to consider the factors specially responsible for that part of infant mortality attributable to infections, with particular reference to the first month of life, and to suggest means for reducing mortality from this cause." The personnel making this inquiry and the manner in which it should be conducted were for the committee to decide, but he had no doubt that all relevant information, including experience and developments elsewhere, would be carefully weighed.

#### Notes in Brief

In 1943 2,443 other ranks, who were in Category A1 on enlistment, were subsequently boarded out of the Army after serving for less than six months.

The amount of the grant-in-aid for the work of the Medical Research Council is £215,000 in the current financial year. The proposal to be submitted in the estimates for 1944-5 is for a grant of £250,000.

No. 10

## EPIDEMIOLOGICAL NOTES

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 11.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	90	7	31	5	3	86	7	31	1	4
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Diphtheria .. ..	624	29	143	97	38	794	36	199	99	34
Deaths .. ..	12	—	3	2	—	24	—	4	3	—
Dysentery .. ..	208	23	75	2	3	78	8	41	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	—	—	—	1	—	2	—	—	—	—
Deaths .. ..	—	2	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	53	8	8	—	—	47	10	3
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	6	—	—	—	—	13	—
Deaths .. ..	35	5	15	13	1	57	9	9	17	4
Measles .. ..	2,098	244	306	414	3	19,799	1,364	529	11	93
Deaths .. ..	2	—	2	6	—	20	1	1	—	1
Ophthalmia neonatorum .. ..	84	4	22	1	1	88	5	26	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	3	—	—	1(B)	1(B)	4	—	—	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,178	62	9	16	7	1,315	90	23	2	13
Deaths (from influenza) .. ..	42	5	3	1	—	69	7	7	4	3
Pneumonia, primary .. ..	—	—	355	32	—	—	63	428	30	—
Deaths .. ..	71	—	26	9	—	—	—	30	12	—
Polio-encephalitis, acute .. ..	2	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	3	—	1	—	—	5	—	—	3	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	1	10	—	—	—	1	15	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	173	4	11	1	3	160	12	14	2	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,215	141	256	31	127	1,907	126	309	55	46
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Smallpox .. ..	2	1	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	—	—	1	9	2	4	1	4	5	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,906	178	142	37	22	1,864	138	214	88	24
Deaths .. ..	8	1	—	3	—	18	7	2	1	—
Deaths (0-1 year) .. ..	410	45	84	52	14	438	57	94	56	30
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	5,738	931	796	288	154	5,053	800	682	239	158
Annual death rate (per 1,000 persons living) .. ..	—	—	18.3	18.8	†	—	15.4	15.7	†	—
Live births .. ..	7,320	938	989	326	290	6,369	741	934	373	294
Annual rate per 1,000 persons living .. ..	—	—	20.1	21.3	†	—	19.1	24.7	†	—
Stillbirths .. ..	256	30	40	—	—	241	21	32	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	39	—	—	—	33	—	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Discussion of Table

In England and Wales during the week the total cases of scarlet fever exceeded those of the previous week by 218. Acute pneumonia showed a similar increase of 195, measles of 111, and cerebrospinal fever of 37, while there were 57 fewer cases of diphtheria, and 10 fewer of dysentery.

A small rise in scarlet fever was general throughout the country, but particularly marked in Yorks West Riding and Nottinghamshire, where the totals were respectively 36 and 35 more than last week. The incidence of measles fluctuated within the counties: Kent's total was 117 higher than last week, Norfolk's 67, and Wiltshire's 60; and Gloucestershire's total dropped by 74, and Lancashire's by 51. The rise in pneumonia was most rapid in the counties of the west midland region, where there were 80 cases in excess of last week's total.

The notifications of dysentery, 208, remained at a high level. No new outbreak of any size was reported, and the largest returns were those of Surrey 27, Lancashire 26, London 23, Yorks West Riding 20, Middlesex 19, Sussex 10.

In Scotland an increased prevalence was recorded for measles with a total 88 higher than last week, acute primary pneumonia with a total 73 higher, whooping-cough with a total 39 higher, and scarlet fever with a total 33 higher, while the notifications of diphtheria fell by 33. In Glasgow the total notifications of measles rose by 100 cases, and those of pneumonia by 20; 20 of the 31 cases of cerebrospinal fever were recorded in this city. The largest returns of dysentery were Glasgow 12, Falkirk 11, and Edinburgh 10.

In Eire, notifications of measles and diphtheria fell slightly. In Dublin C.B., the incidence of measles was down by 49, but it rose by 38 in the rest of the country.

In Northern Ireland the incidence of scarlet fever rose to a total of 50 more than last week. The notifications in Belfast C.B. rose from 42 to 72.

## Smallpox

A further case of smallpox has been reported from Mount Vernon Emergency Hospital, Middlesex, making the total 12. A case of smallpox having occurred in Yorks West Riding, Pudsey M.B., the medical officer has decided that chicken-pox shall be a notifiable disease for one month.

## Week Ending March 18

The notifications of infectious diseases in England and Wales during the week included: smallpox 3, scarlet fever 2,395, whooping-cough 2,026, diphtheria 685, measles 2,226, acute pneumonia 1,284, cerebrospinal fever 87, dysentery 269, paratyphoid 5, typhoid 6. In the great towns there were 51 deaths from influenza.

## Points from Abroad

Siegmund (Klin. Wschr., 1943, 22, 763) observes that the disease process in epidemic hepatitis is based on that of an acute diffuse hepatopathy, associated with disturbed capillary circulation, altered permeability of the capillary walls, and consequent changes in the mesenchymatous and parenchymatous parts of the lobule. At an early stage the capillary walls are "loosened," the capillary membranes stretch, and the cells in the walls increase in size and number and often show lysis. The liver cells also soon become enlarged and show cloudy swelling. Holler says that the two common signs are diarrhoea and jaundice. In his opinion epidemic hepatitis is to be classified with those infections with a monocytic reaction. Beiglböck states that in epidemic hepatitis swellings of the lymph glands and enlargement of the liver and spleen are common. Jaundice is not a constant symptom. Histologically the picture is of a striking reaction of reticulo-endothelium and connective-tissue apparatus, accompanied by more or less comprehensive injury of the liver cells. In severe cases this may be accompanied by an increased capillary permeability. Transition into subacute liver atrophy on the one hand and into cirrhosis on the other hand occurs.

According to Vetter (Klin. Wschr., 1943, 22, 767), since 1938 there has been observed in Germany a new inflammatory disease of the conjunctiva and cornea which has assumed epidemic proportions hitherto unknown. Its course is divided into the stage of acute conjunctivitis and that of nummular keratitis. A typical sign in the first stage which is important for diagnosis is the palpable and often visible swelling of the regional (auricular and submental) lymphatic glands. The nummular foci present in the second stage, and always separated from each other by normal corneal tissue, can, however, also develop into confluent surface infiltrations which can very easily lead to desquamation of the epithelium, thus producing severe ulcer similar to ulcer corneae serpens. As a result of the formation of scars, visual disturbances often remain. In contrast to earlier observations, the disease also attacks children under 12 years, even 2-year-old infants.

## Medical News

Dr. Charles Hill will speak on the White Paper at a meeting of the Yorkshire Branch of the B.M.A. to be held on Sunday, April 2, at 2.30 p.m. at Philosophical Hall, Park Row, Leeds.

A meeting will be held on Wednesday, April 5, at 4.30 p.m. at Manson House, 26, Portland Place, London, W.1, to which all medical practitioners in St. Marylebone have been invited, to discuss by question and answer the implications of the White Paper. At least one prospective Parliamentary candidate and a Member of Parliament will be present, and Mr. W. McAdam Eccles will preside.

The British Council has for disposal several copies of each of the following publications: *Biological Surgery in Tuberculosis* (1942), *Biological Surgery in Bone-tuberculosis Patients* (1941), and *Lung Puncture as a Biological Treatment of Divers Localizations of Tuberculosis* (1942), all three by C. Robertson-Lavalle; also *Adecuación al Trabajo* (1943), by H. J. A. Rimoldi. Copies of any of the above will be sent gratis to practitioners, libraries, institutions, etc., on application to the Medical Department, British Council, 3, Hanover Street, W.1.

The Institute for the Scientific Treatment of Delinquency announces a course of twelve lectures on criminal law and administration, to be given by Mr. A. L. C. Morrison on Saturdays at 2.30 p.m., beginning April 15, at 17, Manchester Square, W.1. The fee for the course is £1, single lectures 2s. There will be no lecture on May 13 or May 27. Ten lectures on the historical background and present position of psychology are to be given by Prof. J. C. Flugel on Sundays at 5.30 p.m., beginning May 21. Fee for the course 17s. 6d., single lectures (only if seats are available) 2s. Further particulars may be had from the general secretary at the above address.

A series of "health weeks" have been held in all the factories in the Rootes group of companies, and the last will begin on April 24. Sir William Rootes, who takes a great interest in the welfare of the 40,000 people in the factories he controls, has inaugurated these with the object of reducing the amount of time lost through avoidable illness and to educate the worker in preventive medicine. The daily programme of events takes place in each factory canteen at lunch-time and during the night-shift break, and includes films and talks on a number of medical subjects; also demonstrations on the preparation of nutritious and palatable food. A special feature of the health weeks is an all-medical "brains trust."

Dr. John R. Williams contributes to the February number of the *Canadian Medical Association Journal* an account of the launching of the s.s. *Frederick Banting* at the Bethlehem-Fairfield Shipyard in Baltimore, Maryland. The ship, a Liberty, is 500 feet long and displaces 10,000 tons. Among those attending the ceremony from Toronto were President Cody of the University, Lady Banting, and Dr. Charles H. Best, and among those representing the Canadian Government was Ambassador Leighton McCarthy. The ship was christened in the traditional manner by Lady Banting, who said afterwards that of all the honours that had been conferred upon her husband she was sure this would touch him most. She presented a portrait of her husband to be placed in the cabin of the ship, and Dr. Best spoke feelingly of his association with Sir Frederick Banting. Mr. Bouslog said that in view of its broad implications of international good will, the U.S. Maritime Commission, which he represented at the launching, had decided to present the s.s. *Frederick Banting* to the British Government.

The Medical Consultative Committee appointed to act for the associated village settlements of Papworth and Enham, of which the hon. medical director, Group Captain R. R. Trail, M.D., is chairman, has set up a research committee to advise on the direction of medical research work at these settlements and to co-ordinate this work with other research investigations on tuberculosis in this country. The following have accepted invitations to serve on this committee: Sir Arthur S. MacNalty (chairman), Sir Joseph Barcroft, Prof. S. P. Bcdson, Dr. F. R. G. Heaf, Sir John Ledingham, Prof. W. H. Tytler, Prof. O. L. V. de Wesselow.

The Central Council for Health Education intends holding two summer schools during 1944. One will take place at Whitelands College, Bede College, Durham, from July 24 to Aug. 3, and the other at Chelsea Polytechnic, London, from Aug. 9 to 19. The programme will cover all aspects of health education (including sex education) and should be of value to teachers, youth leaders, educational and medical administrators, nurses and health visitors, social and industrial welfare workers, etc. Many applicants had to be rejected from the 1943 school owing to lack of accommodation. Those wishing to receive early notification of the forthcoming schools should send their name and address on a postcard to Mr. Cyril Bibby, Central Council for Health Education, Tavistock House, Tavistock Square, W.C.1.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

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### ANY QUESTIONS?

#### Protection against X Rays

Q.—Some people do x-ray work without adequate personal protection. What should the latter consist of, when screening or taking films?

A.—The first care of every practitioner approaching radiography and screening with unfamiliar apparatus is to familiarize himself with the normal functioning of the set for screening and radiography. In using it he must be prepared to accept the responsibility for the welfare of his patients and his technical assistants as well as for himself. Should trouble arise his work may be assessed on this presumption—that he has specialist training and experience.

Manufacturers and designers of x-ray apparatus have before them the National Physical Laboratory standard of protection, which guides them in securing a recognized standard of tube and apparatus safeguards, but the use of unorthodox technique and home-made modifications of the set may introduce grave dangers. It is therefore wise to put to oneself the following questions: Is the set of N.P.L. standard? Am I using correct technique and the set in the manner for which it was designed? Where any doubt exists as to the safety of the general working conditions the N.P.L. will, for an appropriate fee, carry out the necessary investigations. Special films can be obtained from the N.P.L., and these films can be worn on the person for the appropriate period and returned to the N.P.L.; from them can be ascertained the radiation exposure received in the area on which the film was worn.

The British X-ray and Radium Protection Committee was formed in 1921 for the express purpose of preparing recommendations to arrest the sequence of casualties to x-ray and radium workers; the sixth revised report (Feb., 1943) is readily available in printed booklet form, and can be obtained on application to the General Secretary, British Institute of Radiology, 32, Welbeck Street, London, W.1. All who use x rays or radium should be familiar with the contents of these recommendations.

A few general practical observations may not be out of place. The amount of work to be done is of course an important factor. With little work properly carried out the risk is proportionately less, but with misuse of present-day powerful apparatus irreparable damage may occur in a few minutes—one might even say seconds without exaggeration. With much work the danger-point may easily be reached, and it is all too true that familiarity breeds carelessness. The modern practice is to affix the protective material to the apparatus; even so, the lead-rubber apron may still be desirable. Lead-rubber gloves should be available for palpation and should be worn always by those who have occasion to contaminate their hands with iodine or other irritants, or frequently to "scrub up." All x-ray tubes should be provided with a filter equivalent to at least 1 mm. of aluminium. Distance is a great safeguard when diagnostic exposures (radiographs) are being made. Everyone should be as far away from the tube and the patient as possible, preferably behind a lead protection screen and behind the x-ray tube. Technical assistants and others present should be made to observe this principle during screening and radiography because there is a danger zone of secondary radiation all round the area of the patient that is being examined. The narrowest cylindrical diaphragm that will just "cut" the corners of the film size in use not only improves all radiographs but is a great aid to protection.

For screening, the room should be provided with a light-dimming switch so that preparation can be made in a progressively dimmed light, thereby economizing the time necessary to become fully dark-adapted. Red lighting is an alternative. It should not be possible for the eyes to meet an unshaded electric globe. The minimum screening current should be used at normal screening distances: 3 mA at from 60 to 75 kV is adequate; if it is not, then suspect your dark-adaptation. Resist the impulse to increase the



screening current; nothing is gained, and, in fact, much is lost, by over-illumination of the screen (some may doubt this, but it is a fact easy of demonstration). Intermittent screening—one or two seconds on and off—is a habit to be cultivated. The mechanical rectangular diaphragm should be closed down to the limits of the area under observation, and it should not be possible to open it to an area larger than the area of the fluorescent screen. Displacement of the tube in relation to the screen should be prevented by mechanical fixation.

According to the part under examination all screening should be approached with a definite set of questions to be answered and dealt with in a routine order; if this is done the screening time will be very much shortened. It is all too easy to leave the screen with as blank a mind as when one started. The manipulation of fractures and the removal of foreign bodies under "live" screen control should be absolutely taboo.

Protection lies in following the rules; copy not those who appear to break them.

#### Cold Agglutinins

**Q.**—In the most interesting and useful reply given to the question on influenza in the JOURNAL of Dec. 11 reference is made to cold agglutinins. Could we be told just what these are, and, what their clinical significance is?

**A.**—Cold or auto-agglutination is a rare phenomenon that may occur in a variety of conditions—e.g., haemolytic or other severe anaemias, paroxysmal haemoglobinuria, trypanosomiasis—and has lately come into prominence because of its frequent occurrence in primary atypical pneumonia. The phenomenon is apparently due to a true agglutinin which acts only when the blood is cooled to a low temperature; this agglutinin acts not only on Group O blood but also on the blood cells of the patient—i.e., it is an auto-agglutinin. Primary atypical pneumonia is an influenza-like infection characterized by a persistent unproductive cough and positive radiological findings in the lungs. The infection is not easy to diagnose without x-ray examination, and even with it may be simulated by influenza or bronchopneumonia, tuberculosis, and bronchiectasis. The presence of cold agglutinins would therefore serve as a useful method of diagnosing primary atypical pneumonia if constantly present in that infection and absent in other similar diseases. Turner and his colleagues (Lancet, 1943, 1, 765) have supplied evidence that this may be so. Thus, although cold agglutinins may be present in normal blood in low titre (up to a dilution of 1/16 of the patient's serum) they appear in much greater quantity in the blood of patients with primary atypical pneumonia and behave in this disease like a specific antibody—i.e., they develop about the tenth day of the disease and disappear in convalescence. For the test 2 to 3 c.cm. of patient's blood is taken off, the serum is separated, and falling dilutions of it are mixed with a 3% suspension of washed Group O human erythrocytes. The tubes are placed in the refrigerator overnight (2° to 5° C.) and read the next morning in the same way as the Paul-Bunnell test. Titres from 1/32 to 1/2000 are obtained. The reaction is reversible, as can be shown by placing the tubes in a water-bath or incubator at 37° C., when the clumping disappears. No satisfactory explanation of the phenomenon has yet been given.

#### Erythema Nodosum

**Q.**—What are the present views on the causation of erythema nodosum? If the streptococcus is believed to be an aetiological factor, should cases of erythema nodosum be treated with one of the sulphonamide drugs?

**A.**—Erythema nodosum is believed to be an allergic reaction to infection, most commonly by the tubercle bacillus or the haemolytic streptococcus. In from 10 to 30% of cases frank tuberculosis later develops, and erythema nodosum should always be the signal for a careful clinical examination, sputum test, and x-ray film of the chest; inquiry for contact; and subsequent supervision and x-ray examination of the chest at intervals. In the cases believed to be due to streptococcal infection there is often a history of a sore throat a week or ten days previously. By the time the skin lesion appears it is too late to use sulphonamide treatment, as the trigger of the allergic explosion has already been fired. The condition is strictly comparable with acute rheumatism, where sulphonamides are of no value in treatment, though they may be of great value in the prevention of attacks.

#### Testicular Pain

**Q.**—Can you suggest diagnosis and treatment for a man aged 48 troubled by painful swelling of the testes accompanied by lower abdominal pain of a dragging nature? If left alone it will subside in a few days, but will go immediately upon coitus or masturbation. Causes patient intense mental anxiety and worry.

**A.**—The pain in the testicles in this case is probably comparable with that complained of in certain cases of severe varicocele, and is related to congestion. In the present case, as in many others, it is relieved by intercourse, which in some poorly explained way acts as a method of decongestion. The disability which it causes is more mental than physical, but all methods tending to reduce congestion

are worth a trial. Thus a good suspensory bandage, and the administration of a saline purge, possibly combined with a glycerin suppository, would be of help.

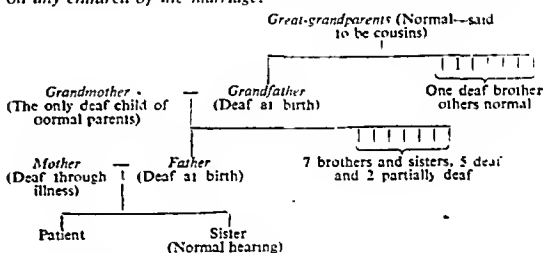
#### Shutting Out Sound

**Q.**—A patient who has to do work requiring much concentration in noisy surroundings is anxious to obtain an ear appliance which will completely shut out sound. He has tried wax ear-plugs, but these were not sufficiently sound-proof. Can you suggest an alternative?

**A.**—There is no appliance which completely shuts out sound. Noise is made up of high and low frequencies which may peak at varying intensities. Ear appliances such as plugs and pads attenuate high frequencies of the spectrum to some extent but have comparatively little effect on low ones; consequently sound as such will still be heard. The over-all intensity is affected only to a limited extent. The attenuation of sound is dependent on the density of the substance interposed between the source of sound and the ear—a brick wall, for example, attenuates it more than a wooden partition. Most ear-plugs made of solid material are uncomfortable if one aims at complete occlusion of the meatus. If much concentration for work is necessary, then sound-proofing of the working surroundings is the only remedy. Fibrous plasticine or any such malleable substance moulded to fit the external auditory meatus so as to obtain a tight seal is the only alternative.

#### Congenital Deafness

**Q.**—Herewith a note of my patient's family history. Can you advise me what is the likelihood of her children being affected by deafness? My patient's hearing is apparently normal. She is engaged to be married, but is very anxious about the possible effect on any children of the marriage.



**A.**—The congenital deafness, or deaf-mutism, in this family group shows recessive inheritance, as is usual. The chances are two to one in favour of the patient being a carrier. In my opinion, however, this is not a ban to marriage provided that she does not intend to marry a blood relative on her father's side, or anyone with a family history of congenital deafness. With these exceptions the risk of a child being deaf should be only small—in fact, little greater than the risk of a recessive defect of some kind or other turning up in any marriage; for most of us, if we but knew it, are, in all probability, carriers of at least one such defect.

#### U.V.L. for Rickets

**Q.**—What are the present views on the use of ultra-violet light (quartz mercury vapour lamp) in (a) the prevention and cure of rickets, (b) for prophylaxis in children in comparatively sunless areas? (c) Is there any evidence that U.V.L. is carcinogenic, and (d) what is your opinion on the statement that "there is no definite means of measuring the dosage"?

**A.**—(a) The antirachitic properties of ultra-violet rays of the appropriate wave band (2,400 to 3,100 A.U.) are not in doubt. It is, however, conceivable that their application to the human skin may be futile if this does not contain those substances from which vitamin D is elaborated. Nor is it effective where the corneal layer is so thick or dirty as to prevent penetration of the rays. (b) Man was not intended to exist in the absence of sunlight, but some measure of adaptation is clearly possible. For those who fail to adjust themselves to reduced sunlight—particularly when dietetic provisos are satisfied—artificial light constitutes an excellent prophylactic. Some authorities rightly regard indiscriminate irradiation in the absence of indications as an error, on the grounds that the tolerance to radiation is increased and that this may detract from the efficacy of application when indications do arise. (c) Although the lethal action of U.V.R. on living cells results in the liberation of substances which provoke proliferation of cells, there is no conclusive evidence that when it is used in therapeutic dosages the proliferation ever assumes malignant qualities. (d) It is incorrect to state that "there is no definite means of measuring dosages." With elaborate physical equipment it would be quite possible to say at the end of a treatment: "X ergs or calories of a radiation

of Y wave-length have been allowed to impinge on this patient's skin." A similar statement would have to be made for every other wave-length employed. This would constitute a quantitative measurement of the dosage. How much of the radiation would be effective is another problem. The cost of the apparatus required for such a computation and the time required for it would offset the meagre practical return that would accrue.

#### Appointment of Coroners

**Q.**—*What system governs appointments to the office of coroner—i.e., by whom are such appointments made, are they advertised, or is it customary to appoint the deputy already in office? How are coroners nominated, and what are the limits of income available from their office? Is any preference shown to an applicant with a legal qualification over one who is medically qualified? Are any such appointments given only to applicants possessing both medical and legal qualifications?*

**A.**—A county coroner is appointed by the county council, a borough coroner by the borough council (Coroners (Amendment) Act, 1926, s. 2). If the district of a county coroner is wholly within a county borough the appointment is made by the council of that borough (Coroners Act, 1887, s. 33; Municipal Corporations Act, 1882, s. 34 (4)). There still remain a few franchise coronerships, but with certain exceptions Sect. 4 of the 1926 Act provides for their abolition and absorption in the county when a vacancy occurs. An appointing authority is not obliged by law to advertise a vacant coronership, but it is customary to advertise in the legal and medical press. There is no recognized practice of appointing the deputy already in office, but naturally it is a convenient way of training a new coroner. Coroners are remunerated by salary paid by the appointing authority under Sect. 5 of the 1926 Act, and they receive pensions (Sect. 6). The salaries of most of the surviving franchise coroners are paid by the county council. The salary paid to each coroner in the country will be found in Table XXXII of the volume of criminal statistics for 1938 (Cmd. 6167). The report for 1936 of the Departmental Committee on Coroners (Cmd. 5070), para. 16, also gives some information about the range of coroners' salaries. The pay of a deputy coroner is arranged between the coroner and deputy; the coroner's salary covers travelling and other incidental expenses, and the payment of a deputy is one of the matters which the appointing authority takes into account in fixing it. The 1926 Act, Sect. 1, requires that a coroner appointed since it became law shall have legal or medical qualification. In 1936, of the 309 coroners in England and Wales 268 were barristers or solicitors, 37 were medical practitioners, and 4 had no professional qualifications. A few of the barristers and solicitors also possessed medical qualifications (see the report on coroners (supra), paras. 11 and 13). This report contains further information on the law and practice concerning coroners, and the questioner may also refer to Jervis on *Coroners*, 7th ed., 1927, and other standard textbooks.

## LETTERS, NOTES, ETC.

#### Certification and Secrecy

**Dr. J. H. YOUNG** (Leigh, Lancs) writes: The recent correspondence on professional confidence prompts me to report a case which occurred recently in my practice. A patient employed by the Ministry of Works was found to be suffering from pulmonary tuberculosis. His employers demanded a certificate of disability. On this I merely stated "illness." The Ministry insisted on knowing the nature of the complaint and would not listen to my explanation that professional secrecy forbade such a disclosure. Eventually "for the sake of fear" the patient, in a written declaration, asked me to disclose the nature of his illness. I refused to do so without such sanction, an attitude in which, I am glad to say, I received the support of the Medical Defence Union. Surely it is time the profession made a stand against such demands from employers. I must state, however, in all fairness that the majority of employers in this district appear to be satisfied with the word "illness" (or "accident"). It is not difficult to imagine embarrassing circumstances arising on frequent occasions if we are always to inform employers the nature of a patient's illness.

#### Thymus and Death under Anaesthesia

**Dr. W. J. MOORE** (Glasgow) writes: The question on the thymus and death under anaesthesia (Feb. 19, p. 277) interested me, as many years ago I introduced what I have called fractional electro-coagulation of the tonsils of such patients, and I have now dealt successfully with many cases. As a matter of fact I have just finished with a child of 5 who had very large tonsils; but from the point of view of his cardiac condition and a very prolonged coagulation time I felt it was unwise to attempt anything in the nature of radical operation. My first case was that of an adult over twenty years ago. Admitting that the treatment requires at least from six to twelve sittings the attempted results so far have been very desirable. I have not the slightest doubt that if this technique were adopted the

tonsils would be very satisfactorily dealt with. I have seen various forms of treatment mentioned tried, but without success during the times I was assistant to the late Dr. John McIntyre have written several papers, but so far have not published any relative to the tonsils, although I had intended making a communication on them at an early date.

#### Fröhlich's Syndrome

**Wing Cmdr. H. M. STANLEY TURNER** writes: I do not quite know the answer in "Any Questions?" to the query on this (Feb. 12, p. 242). Fröhlich's syndrome should be distinguished from pre-puberty infantilism, which it resembles so closely in appearance. The difference is that in the latter condition (most of the cases have been in girls) menstruation appears, the adipose tissue decreases, and there is a normal development of secondary characteristics without the need for physiological stimulation. Therefore I should be inclined to wait until the child reaches the age of or even 15, to give normal puberty a chance, rather than give stimulation at too early an age. Some of the subjects of pre-puberty infantilism show degenerative changes in the ovaries when they reach adult life. One of my cases suddenly developed all the signs of perforated appendix, a diagnosis confirmed by the surgeon. At the time the abdomen was opened the peritoneal cavity contained a quantity of blood, due to haemorrhage into and rupture of one of the right ovary, about as big as a small orange.

#### Mercurial Poisoning

**Dr. DAVID HALER** (London, W.1) writes: In your reply of March 11 (p. 381) to an inquiry about the danger of mercurial poisoning arising from the prolonged use of salyrgan or mersalyl you give a list of toxic symptoms. It is worthy of note that you do not mention sudden death, which may occur with incredible speed during the intravenous injection of these mercurials. The mechanism of this unfortunate result appears to be obscure, but it is probably a greatly increased risk in chronic nephritis. At least one fatal case was described in the *Lancet* in a single communication in 1943. I personally have seen another case also in 1943; in this instance the patient was a chronic nephritic, and necropsy findings were characteristic only of that disease. Even though these cases do not appear to be very common, still they were sufficiently important to justify your noticing them among the various dangers of the therapy.

#### Faints in Blood Donors

**Dr. FRANCES M. TAYLOR** (Ambleside) writes: In the report to the Medical Research Council on fainting in blood donors (*Journal*, Feb. 26, 1944) no mention was made of the height of the blood pressure. I have the impression (gained only from general practice) that a large proportion of those persons who faint, or feel faint during bleeding are those with a systolic blood pressure of 120 mm or under. It would be interesting to know if any systematic observations on this point have been made.

#### Nausea and Vomiting of Pregnancy

**Dr. A. R. MONTGOMERY** (London, N.4) writes: The answer to a question in the *Journal* of March 4 (p. 346) states that none of the numerous remedies advised has proved satisfactory. As I have found coramine (oral) and benzedrine tablets very useful in this distressing complaint, I should be interested to know whether others have tried either of these preparations. Nausea and vomiting of pregnancy is often associated with a lowered blood pressure, and it was this association which suggested the use of stimulating drugs. Coramine gives an immediate effect, while benzedrine can be taken as a prophylactic first thing in the morning. It should not be necessary to emphasize that other possible causes are taken into consideration and dealt with as required. Good results have also been obtained in related conditions—e.g., sea-, car-, and air-sickness.

#### Silicosis in a Chert-miner

**Dr. C. W. EVANS** (Bakewell) writes: In November, 1942, I published an article by me on silicosis in a chert-miner. I have recently had another case which is of some interest. The patient died from silicosis and tuberculosis at the age of 45. He had worked in chert for 20 years in a Bakewell mine. There was no family history of tuberculosis. The lungs post mortem showed definite nodules of silicosis as well as extensive tuberculous changes. There had been a very considerable degree of cyanosis and edema in this case for the past two years. This is apparently the first case of silicosis proved post mortem by sections, although my former patient—the patient is still alive—has been acknowledged by the Medical Board as being due to chert by x-ray findings. Of course I am only referring to silicosis which has chert as the cause. There is one other interesting point in this case. The widow has refused to accept compensation because a claim was not made within five years of his leaving the mine. In point of fact the diagnosis of silicosis was not made until radiographs were taken by Dr. Hugh Macdonald at the Matlock Tuberculosis Clinic, where the patient was referred for the treatment of tuberculosis. My thanks are due to Mr. Harding of Sheffield for sections of the lungs.

LONDON SATURDAY APRIL 8 1944

SYMPTOMLESS INCOMPATIBLE TRANSFUSION AND RESULTANT CHANGES  
IN ISO-AGGLUTININ TITRE

BY

R. DRUMMOND, M.R.C.S.

*Transfusion Officer, Welsh Board of Health; Late Assistant Lecturer in Pathology, Welsh National School of Medicine, Cardiff*

Compatible blood transfusions in which studies of iso-antibody titre have been made are not numerous. The number of these mishaps reported in the literature is not a reflex of their incidence. In the case here reported blood-pumping technique was impeccable. The mishap, mercifully without any consequences, occurred for a different reason—namely, scrupulous care was not taken to see that the correct type of blood was obtained from the blood bank. The instances were somewhat similar to those in Mollison's (3) Case 10, in which effete group O blood was given to a group A recipient. After 19 days in cold storage the blood was left on a shelf at room temperature for four weeks. The nurse sent to fetch the blood selected this bottle instead of the correct one in the refrigerator. An hour after transfusion there was haemoglobinuria but no surviving donor cells. A febrile reaction occurred, but no further sequelae were noted.

## Previous Reports

Wiener (1937-8) studied a group O recipient who recovered after receiving 500 c.c.m. of group A blood. In preliminary tests the recipient's serum did not agglutinate the donor's cells. The biological test of Oehlecker (1921) was negative. Haemoglobinuria, jaundice, oliguria occurred. Two days later the anti-A titre was 20. It fell to 200 in the fifth week and fell to 70 in the ninth week. A group A haemolysis was detected. Wiener (1939) and Wiener (1941) studied a group O recipient transfused with 500 c.c.m. of group B blood. Rigor and haemoglobinuria resulted. In a few days the anti-B titre was only 1, but on the thirteenth day it was 10. Wiener (1941) investigated a group B recipient who recovered after receiving 150 c.c.m. of group AB blood. Rigor and haemoglobinuria occurred. Shortly after transfusion the anti-A titre for agglutination was 4 and for A<sub>2</sub> cells 0. A peak of 512 was attained on seventh day against A<sub>2</sub> and A<sub>1</sub> cells. Mollison and Young (1941) observed a group O air-raid casualty transfused with citrated group B blood (content, 360 c.c.m. whole blood) and unpooled group A sera. Group O blood and pooled plasma were also given. A febrile reaction occurred after transfusion. Eight hours after the incomplete transfusion the anti-A titre was 128, but some hours later it was only 32. The anti-B titre fell as low as 2. There was a subsequent colossal rise in titres. On the eighth day the anti-B titre was 500,000, and on the eleventh day the anti-A titre was over 100,000. Return to normal was slow. Rise in anti-A titre was due to group A substance in the transfused unpooled group A sera. Agglutinates were present in the recipient's blood for seven days after the incompatible transfusion. A haemolysis acting on A and B cells was observed from the seventh to twenty-fifth days. Anti-M and anti-N were not involved. Rises of anti-A titre to 16,384 and 100 were observed by Mollison (1943) in two group O recipients transfused respectively with 45 c.c.m. and 1,000 c.c.m. of group A blood; both recovered.

Certain workers, apart from those mentioned, used differential agglutination to study the *in vivo* survival of incompatible erythrocytes. Jervell (1924) reported the following cases. (i) A newborn child with megalena neonatorum. It was group O, but the  $\alpha$  and  $\beta$  agglutinins were absent. It received 100 c.c.m. of group A blood from its mother. The donor's cells survived six weeks. The mother's  $\beta$  agglutinin was detected in the child's serum for two weeks, and attained a titre of 10 on the second day. (ii) A group B child transfused with 600 c.c.m. of group O blood and 600 c.c.m. of group A blood. After being jaundiced she recovered. All

group A cells were eliminated in 12 hours. (iii) A group B female given 550 c.c.m. of group O blood and 350 c.c.m. of group A blood. She had a severe reaction, and died three hours later. The recipient's serum agglutinated the donor's cells to 1:4 and completely haemolysed them in 15 minutes. Blood taken by cardiac puncture 10 minutes after death showed marked haemoglobinuria and no surviving group A cells. (iv) A 2-year-old child, group O, afflicted with leukaemia, given 200 c.c.m. of group A blood. Drowsiness, vomiting, bloody urine, and jaundice occurred. Improvement followed transfusion of 200 c.c.m. of group O blood. The group A cells survived three days. In Lauer's (1941) case, immunization of a group O person to cells of another person (group A) occurred in a skin-graft operation. The anti-A titre was 2048 and later fell to 2. Burnham's (1930) patient, group B, recovered after transfusion with 400 c.c.m. of group A blood. Symptoms were mild. The recipient's serum agglutinated group A cells at room temperature but not at all at body temperature. The donor's cells survived three to five days. Grove and Crum (1930) investigated a group O recipient transfused with 300 c.c.m. of group B blood. No reaction occurred, and this was attributed to inability of the recipient's serum to agglutinate 2% suspensions of A or B cells in test-tubes, after incubation at 42° C. for one hour. The donor's cells were surviving the day after transfusion. The recipient's blood was not further examined till the seventh day, when no donor's cells were found.

Schiff (1924) produced a specific precipitin in rabbit serum against agglutinin-A substance in human serum. Aubert, Boorman, and Dodd (1942) extended Schiff's work. They injected Seitz-filtered human A or B sera into guinea-pigs or human volunteers, and produced anti-A or anti-B antibodies, some of quite high titre. Alternate responses were produced in a group O subject by injecting first group A and then group B serum. Rises in iso-agglutinin titre after incompatible transfusion, while principally due to agglutininogen in incompatible cells, may therefore in part also be due to agglutininogen substance in solution in the donor's plasma.

## Case Report

In the case here recorded the iso-agglutinin changes were studied and an attempt was made to find an *in vitro* explanation for absence of symptoms.

A man aged 54 was admitted to hospital on Feb. 19, 1943, for melena and loss of weight. He was crippled by chronic rheumatoid arthritis, which was still active. Seventeen months ago he had a course of gold salt injections. Seven years ago he underwent an operation for gastric ulcer. Later pain had occurred in the epigastrium after meals and was relieved by taking food. Weight 8 st. 10 lb.; blood pressure, 120/60; blood count—red cells 4,000,000, leucocytes, 7,600; haemoglobin, 40%; blood group, 1 and Rh-positive. On March 22 the haemoglobin was 60%.

On March 23 the patient was inadvertently transfused with group A blood under the following circumstances. The local issuing blood depot was requested to supply group B concentrated red cells. After cross-matching tests the blood was issued and placed in the hospital blood bank. The medical officer in charge of the case instructed a nurse to fetch the blood from the refrigerator. A bottle of blood was selected and given to the medical officer. The bottle label was not examined, and transfusion was started at 6 p.m. at a very slow drip rate. Some 5½ hours later it was noticed that the bottle was labelled group A. The patient had complained of no symptoms whatever. Transfusion was immediately stopped. Approximately 460 c.c.m. of blood had been transfused. The blood mixture consisted of 120 c.c.m. of 2.5% sodium citrate solution, 20 c.c.m. of 10% glucose solution, and 400 c.c.m. of whole blood

The blood had been stored for seven days under proper conditions. The remnant of blood in the bottle was checked and found to be group A, and the cells were agglutinated by the recipient's serum, a specimen of which was collected at the time. The recipient's group was confirmed as B. The group B blood supplied for the recipient was still in the hospital blood bank.

No febrile reaction occurred during transfusion, when the pulse was 76 and temperature 97° F. Six hours later the pulse rose to 102 and the temperature to 100° F. However, the patient felt well. The temperature was normal within 12 hours, and thereafter remained normal or subnormal. In 24 hours the pulse dropped to 76. The recipient had run an occasional pyrexia since admission, and the day before transfusion the pulse was 100. On March 24, some hours after transfusion, 300 c.cm. of 2.5% sodium citrate solution was injected intravenously. Potassium citrate gr. 60 was given hourly by mouth till the urine was alkaline. Intravenous glucose-saline was given at a slow drip rate. General condition satisfactory. Over 24 hours the fluid intake was 94 oz. and output 123 oz. Serum bilirubin, 0.1 mg. per 100 c.cm.; icterus index, 3.3. Trace of urobilin in urine.

**March 25.**—Condition satisfactory. Temperature and pulse normal. Urine normal and no casts or erythrocytes in centrifuged deposit. No haemoglobinuria. The serum of the venous blood was clear; there was neither bilirubinaemia nor haemoglobinuria. During 24 hours the fluid intake was 149 oz. and the output 125 oz. Intravenous glucose-saline discontinued.

**March 26.**—I was asked to make investigations. The patient's complexion was ruddy and his general condition good. No jaundice. Closely interrogated as to whether he had felt any untoward symptoms during the transfusion, he replied confidently in the negative. Indeed, he asserted he felt better for it. Ever since admission to hospital he had had a more or less constant dull aching pain in the dorsal region of the back, and in the ankle- and knee-joints. These symptoms had been present for months. Backache was present all day before transfusion and was in no way worse during or after it. The backache was still present months later. Urine normal and nothing abnormal in the centrifuged deposit. Blood urea, 40 mg./100 c.cm.; icterus index, 4; serum bilirubin, 0.1 mg./100 c.cm. Temperature and pulse normal. Although untoward symptoms were absent, it was decided to take anticipatory measures. Transfusion of compatible blood as recommended by Hesse and Filatov (1932) and Hesse (1936) was advised in combination with preliminary phlebotomy of the recipient. Von Deesten and Cosgrove (1933-4) employed phlebotomy with good result for uraemia due to haemolysis after blood transfusion. Withdrawal of 500 c.cm. of recipient's blood was made by venepuncture and promptly followed by transfusion of 540 c.cm. of group B whole blood (stored in mixture already alluded to). No febrile reaction. During 24 hours the fluid intake was 152 oz. and output 125 oz.

**March 27.**—The patient had some slight transient pain on breathing. Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No reaction. Blood urea, 32 mg./100 c.cm.; serum bilirubin, 0.3 mg./100 c.cm.; icterus index, 5. Fluid intake 150 oz. and output 103 oz. **March 28.** No untoward symptoms. Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No febrile reaction. Fluid intake 104 oz. and output 97 oz. It was noted that the plasma of the recipient's blood withdrawn on the previous day had a peculiar slightly greenish tinge. **March 29.** Withdrawal of 420 c.cm. of recipient's blood and transfusion of 540 c.cm. of group B blood. No reaction. Fluid intake 110 oz. and output 107 oz. Urine normal. Haemoglobin, 66%; blood urea, 31 mg./100 c.cm.; serum bilirubin, 0.05 mg./100 c.cm. **March 31.** Condition satisfactory: haemoglobin, 68%. **April 1.** Urine contained a few granular casts and trace of urobilin. **April 2.** Blood urea, 40 mg./100 c.cm. **April 22.** Haemoglobin, 74%; patient left hospital.

He was observed for several months, and except for the arthritis remained well. There are no grounds for assuming that the bleeding of the recipient and transfusions of homologous blood contributed to the favourable outcome.

#### Special Investigations of Case

Regrettably, in the 48 hours immediately after incompatible transfusion no investigation for methaemalbumin, Schumm's test, or spectroscopy for serum haemoglobin was made. Fortunately a pre-transfusion specimen of the recipient's serum was available at the local issuing blood depot. This specimen was collected the day before the incompatible transfusion. This serum strongly agglutinated the conserved red cells of the donor's blood (now 10 days old). The technique was to mix equal volumes (0.4 c.cm.) of saline, citrated red cell suspension (strength 0.5%), and serum in tubes of 3/8 in. diameter. After standing five minutes at room temperature tubes were centrifuged at 2,000 r.p.m. for two minutes. The groups of recipient and donor were confirmed as B and A respectively. Tests were performed in tubes, and groups were checked on cells and serum. The donor's plasma agglutinated the recipient's cells

weakly. The above results likewise obtained at 37° C., whether tubes were stood five hours or centrifuged. The recipient's serum was diluted 1:25 (i.e., 1 c.cm. serum to 24 c.cm. saline) and titrated against cells of a standard A donor (subgroup A<sub>1</sub>); the titre was 1:100 at room temperature.

The titration technique was similar to that of Challinor, Ives, and van Rooyen (1939). Volumes of 0.4 c.cm. were used. Serum dilutions were doubled in saline from tube to tube. Tubes were 3/8 in. by 2 in. The washed citrated fresh red cell suspension was packed by the centrifuge to a strength of 0.5% in terms of cell sediment. The titre was stated as the greatest dilution in which agglutination was observed. Dilution caused by addition of the volume of red cells was taken into account, though many workers ignore this. Tubes, including controls, were stood five hours at room temperature and then examined for agglutination after adequate flicking with the index finger. The end-point observed by the naked eye was noted, and in succeeding tubes agglutinates were sought for by microscopy. Clumps of 3 to 5 cells were taken as evidence of agglutination. The end-point observed by microscopy was invariably one or two tubes, occasionally three, higher than that noted by the naked eye. Tubes were adequately shaken so as to avoid false positive readings. This precaution is necessary, since if a suspension of red cells in citrate or saline is allowed to settle and is then microscopically after inadequate shaking, agglomerates of cells may sometimes be observed. Such agglomerates may be quite large and resemble clumps of agglutinated corpuscles. Too vigorous agitation may, however, eliminate evidence of agglutination in the higher dilutions. Titrations were done in duplicate.

The recipient's serum taken the third day after incompatible transfusion agglutinated the conserved donor cells only to a titre of 1:16. Identical results were obtained with fresh cells from the incompatible donor and from a standard A donor (subgroup A<sub>1</sub>). Hereafter the titre rose rapidly and attained a peak of 1:25,600 on the fifteenth day. The titre fell slowly, and eight months later had not quite approximated the pre-transfusion level (see Fig. 1). In

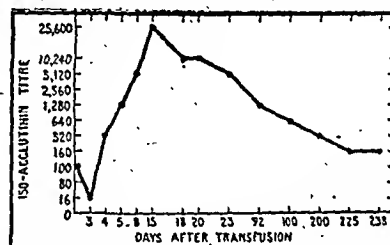


FIG. 1.—Transfusion of a group B recipient with group A blood. The curve shows the initial fall, rapid steep rise, and slow fall of the anti-A titre.

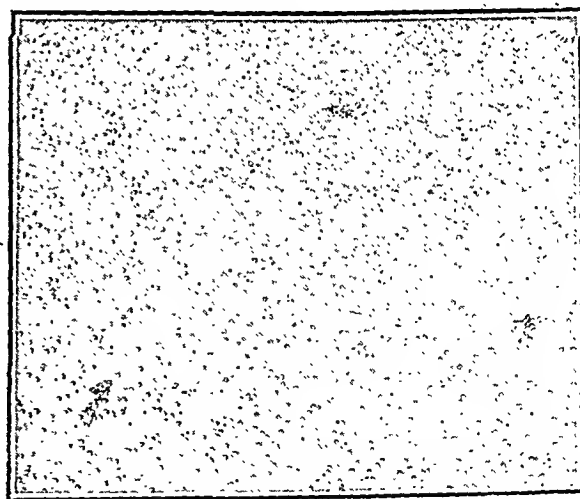


FIG. 2.—Agglutinates of group A cells surviving in the blood of the group B recipient on the third day after incompatible transfusion.

all titrations the same group A donor was used as standard. It was not possible to obtain blood regularly from the incompatible donor. No haemolysis was detected in the recipient's serum; this is in contrast to the observations of Jervell, Rö, and Mollison.

On the third day after the incompatible transfusion 2 c.cm. of the recipient's blood was mixed with 1 c.cm. of citrate solution and allowed to stand till sedimentation was complete. Using a red cell counting pipette, some red cell sediment was drawn up to the mark 0.5, and then citrate solution up to the 101 mark. After mixing, a

few drops were expelled on to a glass slide and examined with a microscope. Agglutinates consisting of 20 to 30 cells were seen lying free among large numbers of unagglutinated cells and were hardly affected by a strong anti-A serum. The red cell sediment, however, was solidly agglutinated by a strong anti-B serum. These observations were confirmed by Prof. J. B. Duguid, who kindly took the photomicrograph (Fig. 2). Four days after incompatible transfusion only a few small agglutinates were found among the recipient's cells, but none were found on the fifth day.

In an attempt to find an *in vitro* explanation for the absence of symptoms, the following investigations (Tests I to IV) were made about eight months after the incompatible transfusion (Nov. 18).

TEST I.—The Incompatible Donor's Serum (anti-B) was Tested for Potency by Titration against the Cells of the Recipient and Cells of Random Group B Persons

Serum	Cells of Group B Persons	Titre					
		2	4	8	16	32	64
Incompatible group A donor	Recipient	++	++	++	++	+	0
	3200 ..	++	++	++	++	+	0
	11623 ..	++	++	++	++	+	0
	11624 ..	++	++	++	++	+	0
	11625 ..	++	++	++	++	+	0
	11626 ..	++	++	++	++	+	0
	11647 ..	++	++	++	++	+	0
	11652 ..	++	++	++	++	+	0

++ = Agglutinates visible to naked eye. + = Agglutinates visible only on microscopy. 0 = No agglutination.

TEST II.—The Recipient's Serum, Diluted 1:10, was Tested for Potency by Titration against the Incompatible Donor's Cells and Cells of Random Group A Persons

Serum	Cells of Group A Persons	Titre						
		20	40	80	160	320	640	1280
Recipient group B	Incompatible donor	++	++	++	+	?	0	0
	Standard donor ..	++	++	++	+	0	0	0
	11623 ..	++	++	++	+	0	0	0
	11624 ..	++	++	++	+	0	0	0
	11625 ..	++	++	++	+	0	0	0
	11626 ..	++	++	++	++	+	+	+
	11640 ..	++	++	++	++	+	0	0
	11646 ..	++	++	++	++	+	0	0
	11647 ..	++	++	++	++	+	0	0
	11654 ..	++	++	++	++	+	0	0

TEST III.—The Incompatible Donor's Cells (Group A) were Tested for Sensitivity against Sera of Random Group B Persons

Sera of Group B Persons	Cells	Titre							
		2	4	8	16	32	64	128	256
3200 ..	Incompatible group A donor	++	++	++	++	++	+	+	0
11623 ..		++	++	++	++	++	+	+	0
11624 ..		++	++	++	++	++	+	+	0
11625 ..		++	++	++	++	++	+	+	0
11626 ..		++	++	++	++	++	+	+	0
11647 ..		++	++	++	++	++	+	+	0
11652 ..		++	++	++	++	++	+	+	0

TEST IV.—The Recipient's Cells (Group B) were Tested for Sensitivity against Sera of Random Group A Persons

Sera of Group A Persons	Cells	Titre									
		2	4	8	16	32	64	128	256	512	1024
11628 ..	Recipient, group B	++	++	++	++	++	++	++	++	++	++
11633 ..		++	++	++	++	++	++	++	++	++	++
11635 ..		++	++	++	++	++	++	++	++	++	++
11636 ..		++	++	++	++	++	++	++	++	++	++
11640 ..		++	++	++	++	++	++	++	++	++	++
11646 ..		++	++	++	++	++	++	++	++	++	++
11653 ..		++	++	++	++	++	++	++	++	++	++
35896 ..		++	++	++	++	++	++	++	++	++	++

Whereas the donor's serum agglutinated the recipient's cells only to 32 (see Test I), yet random A sera agglutinated these cells on an average of 128 to 256, the range being 8 to 1024 (see Test IV). Elsdon-Dew (1936) found the anti-B titre of six A sera to be respectively 512, 16, 64, 32, 128, and 64. Aubert, Boorman, Dodd, and Loutit (1942) found that 22.4% of O sera had anti-B titres of 64, and 13.6% a titre of 256; if the dilution factor caused by adding the volume of red-cells in the titrations be included, the figures become 128 and 512. Clearly the donor's anti-B titre was comparatively low. Aubert, Boorman, Dodd, and Loutit (1942) transfused conscious group A recipients with O sera of high anti-A titre and did not produce dangerous or fatal reactions. Very high titre sera did, however, cause some destruction of erythrocytes. It seems reasonable to assume that the low titre anti-B iso-agglutinin of the donor in no way harmed the recipient's cells, and absence of

symptoms may in part be attributed to this. For instance, the haemoglobin did not fall, being 60% before and 66% the sixth day after incompatible transfusion. The recipient's anti-A iso-agglutinin was but little weaker than the average (compare Tests II and III). Elsdon-Dew (1936) found the anti-A titre of five B sera to be respectively 2048, 32, 256, 2048, and 64. Aubert, Boorman, Dodd, and Loutit (1942) found 26% of O sera had anti-A titres of 256, and 40% had titres of 512 or higher, though, as noted above, these figures do not include the dilution factor. The red cells of donor and recipient were of average sensitivity (see Tests III and IV). In contrast to the findings of Burnham and of Grove and Crum, absence of symptoms was not attributable to inability of the iso-agglutinins to function at 37° C.

As pointed out by Aubert, Boorman, and Dodd (1942), plasma or serum agglutinin may function as an *in vitro* neutralizer of iso-agglutinins in transfused blood, plasma, or serum. However, Aubert, Boorman, Dodd, and Loutit (1942) observed that even if the recipient's plasma has considerable agglutinin content, this will not completely protect the recipient's cells from transfused incompatible iso-agglutinins. To assess agglutinin content of plasma and sera, and therefore their inhibiting power, Aubert, Boorman, and Dodd (1942) devised the "inhibition index" test. Briefly, A or B sera were titrated in saline and the end-point noted. The sera were then mixed in equal proportions and again titrated. Certain sera reduced or inhibited the titre of other sera—an observation also made by Elsdon-Dew (1936). Thus if a titre was reduced from 128 to 16 the inhibition index of the inhibiting serum was expressed as 8. It was indicated that the test was only an approximate guide to the amount of inhibiting substance present. The presence of group-specific substances A and B in solution partly explains reduced titres of pooled plasma or serum.

Seven months after the incompatible transfusion, when the anti-A titre had approximated the pre-transfusion level, the inhibition indices of the recipient's and donor's sera were investigated. It was 0 for each. The titration technique was that already described. The pooled sera were incubated for one hour at 37° C. In titrating the pooled sera the dilution caused by mixing the sera was taken into account and the titre of the first tube was reckoned as 4 instead of 2. There was thus no *in vitro* evidence that the recipient's plasma protected its erythrocytes from the donor's iso-agglutinins, and vice versa. Presumably the donor's iso-agglutinins were absorbed by the tissues of the recipient. Aubert, Boorman, and Dodd (1942) found no evidence that the agglutinating substance in transfused serum neutralized the recipient's iso-agglutinins.

### Conclusion

*In vitro* tests did not fully explain absence of symptoms, though the donor's cells were eliminated in five days. Absence of symptoms may be due to the fact that the incompatible blood was injected at a very slow drip rate. Mollison (1943) mentioned that reactions to incompatible transfusion seemed to be less severe than formerly, and that this might be due to the fact that transfusions are now commonly given at a drip rate. The danger of transfusing compatible blood rapidly into chronically anaemic recipients has been previously referred to by me (Drummond, 1943) and by others. If the blood is incompatible the effects are almost certain to be aggravated. It is possible that the favourable outcome in the case here reported is attributable to the very slow rate of injection of the incompatible blood.

My thanks are due to the medical staff of the hospital concerned for permission to investigate this case, and to Prof. J. B. Duguid and Dr. J. Gough of the Department of Pathology, Welsh National School of Medicine, for helpful criticism.

### REFERENCES

- Aubert, E. F., Boorman, K. E., and Dodd, B. E. (1942). *J. Path. Bact.*, 64, 89.  
 Burnham, L. (1930). *Arch. intern. Med.*, 46, 502.  
 Challinor, S. W., Ives, J. C. J., and van Rooyen, C. E. (1939). *British Medical Journal*, 2, 850.  
 Drummond, R. (1943). *Ibid.*, 2, 319.  
 Elsdon-Dew, R. (1936). *Blood Groups of the Bantu*. Thesis for M.D. Witwatersrand University, 7, 217. Pub. by South African Institute for Medical Research.  
 Grove, E. F., and Crum, M. J. (1930). *J. lab. clin. Med.*, 16, 259.  
 Hesse, E. (1936). *Beitr. klin. Chir.*, 163, 390.  
 — and Filatov, A. (1932). *Zbl. Chir.*, 59, 2674.  
 Jervell, F. (1924). *Acta path. microbiol. scand.*, 1, 201.  
 Lauer, A. (1941). *Z. Immunforsch.*, 99, 453. Abstr. by Mollison, P. L., *Bull. War Med.*, March, 1942, p. 285.  
 Mollison, P. L. (1943). *Arch. intern. Med.*, 61, 529.  
 — and Young, I. M. (1941). *Lancet*, 2, 635.  
 Oebler, F. (1921). *Arch. klin. Chir.*, 116, 705.  
 Rø, J. (1937-S). *Acta chir. scand.*, 80, 253.  
 Schiff, F. (1924). *Klin. Wochschr.*, 3, 679.  
 von Deestén, H. T., and Cosgrove, S. A. (1933-4). *Ann. intern. Med.*, 7, 105.  
 Wiener, A. S. (1939). *Blood Groups and Blood Transfusion*, 2nd ed., Springfield, Ill.  
 — (1941). *J. Immunol.*, 41, 181.  
 — Orenland, B. H., Hyman, M. A., and Samwick, A. A. (1941). *Amer. J. clin. Path.*, 11, 102.



**ANXIETY; ALOPECIA AREATA; NEUROFIBROMATOSIS: AURICULAR FIBRILLATION****DESCRIPTION OF A PATIENT**

BY

**DOUGLAS HUBBLE, M.D.***Assistant Physician, Derbyshire Royal Infirmary; Physician, Derbyshire Hospital for Sick Children*

AND

**C. H. ROGERSON, M.D., M.R.C.P., D.P.M.***Medical Director, Cassel Hospital for Functional Nervous Disorders*

The following account of a patient is published because he displayed three disorders whose aetiology and pathogenesis are unknown. His fourth disorder—a psychological state dependent on an unusual personality—appeared to us to stand in aetiological relationship to two of his three abnormal physical states.

**Case Record**

The patient, a house-painter aged 39, was referred to the Derbyshire Royal Infirmary on May 5, 1943, by Dr. Eileen Crowley for treatment of auricular fibrillation.

**Personal History**

His childhood was quite normal, healthy, and happy. He does not recall any fears or anxieties as a boy. He was the leader of a small group of boys who were rather "young devils." At the age of 12 he passed the necessary examination to enable him to leave school, and he went to work as a riveter's mate. By the time he was 14 he had held a variety of jobs and was earning £2 15s. a week (1918). He was restless and ambitious, and had come to realize how many limitations there were in the life of his childhood; he saw no reason why he should not go a long way. He began to serve an apprenticeship in the carriage-and-wagon works (Midland Railway), but could not tolerate the attempts of the older men to put him in his place. He had a row with one of them and walked out, thinking that he could easily get another job. The post-war difficulties had then begun and he was unable to get work. His pride was hurt, so he falsified his age and joined the Grenadier Guards at 15 years. His father got him out again, but only by paying a forfeit. He was still unable to get a job, and was burning with resentment. He rejoined the Army to get back the forfeit, and then malingered until he was discharged by the Medical Board. He felt better after this, and came back home seeking work.

Then began a long and difficult period of partial employment. In 1922, aged 18, he married a girl two years older than himself whom he had got pregnant. She already had one illegitimate child. He had to live on 34s. a week, so they had a room in the house of her brother-in-law. Soon he found that she had had the illegitimate child by this man, and he became furiously jealous. He thought and dreamed of nothing else for weeks, and made scenes by following the brother-in-law about the streets. His pride was desperately hurt, and it was some years before he ceased to worry about his wife's conduct. At this time (in 1926), aged 22, he developed two patches of alopecia areata on his head.

He made fresh efforts to overcome his difficulties, working partly as a painter and partly as a pianist (he had taught himself to play the piano). Financial worries, however, continued to press on him, and on one occasion he was in prison for failure to pay a debt. Gradually his health deteriorated, his finances grew worse, and his alopecia recurred. Shortly afterwards he got a job at a hospital as a painter, and so had regular work for the first time for years (1932—aged 28). His worries were apparently over, for he had every chance of getting out of his financial difficulties.

Presently he found that a new skin affliction was developing in the shape of nodules beneath the skin of the back of his neck. He became preoccupied with his condition, and after seeing a propaganda film thought he had syphilis. He went to several doctors and had repeated Wassermann tests before he was satisfied about this, and, even so, the doubts have recurred at intervals since then. His hair continued to fall out. He became very ashamed of his appearance; he would try to dodge people, and thought that they were looking curiously at him. This only served to increase his determination to make good and to show his real worth.

After about seven years' work at the hospital he started a house-painting business, and with characteristic energy was soon doing well (1939). When the air raids began he found that there was not much work for him to do, so he joined the A.R.P. He realized that he would get extra money if he could drive a lorry; so he bought a car, learned to drive it in one or two evenings, and passed the necessary test. When the raids died down he was able to go back to his painting business, which continued to do well. He put a

great deal of effort into every job he undertook, worrying greatly over the details of it. In April, 1942, one of his men stole a large sum of money from a firm for which he was doing a job. The man turned out to be a thief who had stolen from other clients of his and the police had to make investigations all round the district where he worked. He was exceedingly distressed, and feared that no one would employ him any more. His heart began to beat irregularly and was shortly afterwards found by his doctor to be fibrillating.

**Family History**

The patient is either the sixth or the seventh of a family of twelve or thirteen children (doubtful about one older child who died). His mother was a fine woman who came from a healthy and highly respected family, and married rather beneath her. She was a great worker in good causes, was full of energy, and used to organize parades on behalf of the hospitals. She died of cardiac disease at 68 years. His father—a blacksmith—was a staunch teetotaler, and a good man. He suffered from rheumatism, and died of an unknown disorder when 65. The patient's paternal grandfather was blind during the latter part of his life and was extremely poor. Of the patient's brothers and sisters eight are still living. All have done very well. Three brothers are at present sergeants in the Middle East. He had no knowledge of any familial illness; nor does he know of any abnormalities of the skin or hair occurring in his parents or siblings.

His wife, aged 40, is in good health, but is a nervous woman. Of their three children, one daughter, aged 21, has a few small pigmented moles, but not café-au-lait patches or skin tumours. She bites her nails and has many night terrors. Otherwise her health is good. The other daughter, aged 18, has one small café-au-lait patch on the neck and many small pigmented moles, but no freckling or skin tumours. She has good health and a stable personality. The son, aged 14, has about 30 café-au-lait patches, the largest 5 in by 4 in. on the back of the left thigh, diffuse freckling on the trunk, but no skin tumours. He has good health, and an impulsive, aggressive temperament, but his intelligence is poor. Under-development of sexual organs and a high palatal arch (speech defect) are other things of note.

**Medical History and Habits**

The patient's hair has been much in the condition described below for eleven years; it has grown slightly during the last two months. He now has to shave once a week, but for the preceding ten years had not shaved at all. The large tumour over the crest of the left

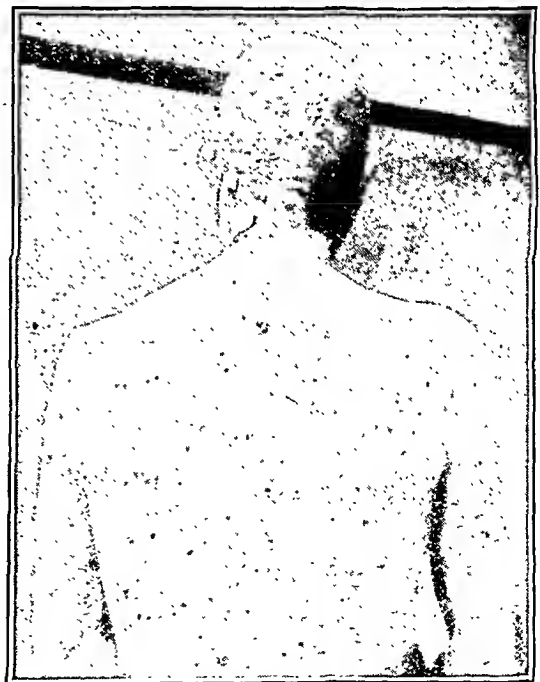


FIG. 1.—Back view of patient.

iliacum has been present as long as he can remember, but he does not think it was there in infancy. The other skin tumours appeared in 1933 and increased steadily in size and numbers until 1939; few if any new ones have developed in the last four years. Although he was aware of his cardiac irregularity at its onset in June, 1942, yet he is now for the most part unconscious of it.

His habit for tobacco is 40 to 50 cigarettes a day and for alcohol 2 to 3 pints of beer a day. He has had no loss of libido at any

time. He is capable of great physical activity, and has had no other illness of importance in his life; no rheumatic fever or rheumatism. He well illustrated his impulsiveness by discharging himself from the hospital on the morrow of his admission and telephoning the following evening asking for readmission.

Examination showed him to be a healthy active man: height 5 ft. 10½ in., weight 11 st. 12 lb. Hair: Fine, sparse hair on scalp; no eyebrows; eyelashes very thin and poor; axillary hair very thin; no visible chest hair; pubic hair very thin and short. Skin: Diffuse freckling on the trunk and a few small café-au-lait patches on the abdomen and lower limbs. Nails are picked and bitten very short. There are no lesions on the mucous membranes. There is no detectable thickening of any nerves, nor are there any fibromata along their course.

**Neurofibromata.**—Hundreds of small skin tumours, varying in size from 1 mm. to 2 cm., are present on the face, scalp, neck, trunk, and limbs (Fig. 1). There is a larger one—a soft sessile tumour measuring 12 cm. across—just above the crest of the left ilium. These tumours occur with the greatest frequency on the scalp, face, neck, and trunk, but they are present in progressively diminishing numbers towards the periphery of the upper and lower limbs. The hands are practically free, and the feet have only one or two small nodules on the dorsum. Some of the tumours are under the skin, but the majority are on the surface of the skin as sessile tumours. They correspond well with the usual textbook descriptions of neurofibromata, which feel as if they were "herniated" through the fascia and can be "reduced" by pressure. The tumours are not painful.

**Circulatory System.**—The pulse is grossly irregular in force and frequency. The cardiac rate is 104 and the pulse rate 86; blood pressure 110/75. The retinal vessels are normal and there is no evidence of arteriosclerosis anywhere. There are no murmurs in the cardiac area, and the sounds are normal. The diagnosis of auricular fibrillation is confirmed by electrocardiogram (see Figs. 2 and 3), and radiographs show a heart shadow normal in size and shape.

The thyroid gland is not enlarged and there is no evidence of thyrotoxicosis: no tremor and no exophthalmos. There is no evidence of other endocrine disorder. Examination of the central nervous system revealed no abnormality, but he has very brisk muscle reflexes. The hands and feet are damp. The urine is normal. The blood sedimentation rate is 10 mm. in the first hour and 18 mm. in the second. His blood count shows: Hb, 103%; red cells, 5,480,000; white cells, 12,000, of which 2,440 are lymphocytes and 610 monocytes; the remaining 75% are neutrophils. His blood cholesterol is 115 mg. per 100 c.cm. of blood. His Wassermann reaction and

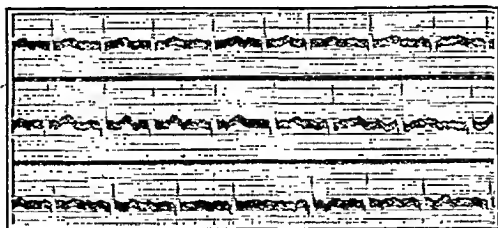


FIG. 2.—Electrocardiogram before quinidine therapy.

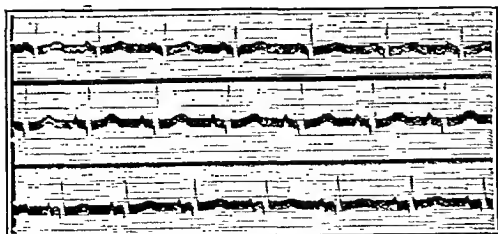


FIG. 3.—Electrocardiogram after 25 gr. of quinidine daily.

flocculation test are negative. A fractional test meal showed a histamine-fast achlorhydria in all specimens.

The report (Dr. G. R. Osborn) on the microscopical structure of a removed tumour from the back of the neck is: "The cutaneous nodule excised measures about 8 mm. in diameter. Microscopically this is a neurofibroma (fibroma molluscum). The most prominent nervous element is whorled groups of Schwann cells (schwannoma). Around these there is fibrous tissue with many small blood vessels. Nothing suggestive of malignancy seen. **Diagnosis:** neurofibroma."

### Psychiatric Summary

Coming from a superior working-class background, possessed of great drive and ambition, impulsive and resentful of failure, this patient suffered great frustration and anxiety, at the peak of which he twice developed alopecia areata. The second attack of alopecia progressed in spite of the partial relief of anxiety, and at this time he developed the multiple subcutaneous nodules. A third severe period of anxiety ten years later coincided with the development of auricular fibrillation. He is a well-spoken and obviously intelligent man who has educated himself beyond the level he would have attained when he left school at 12. His whole attitude indicates the possession of quite exceptional drive and ambition, with a keen sense of pride in his own achievements and strong resentment against the social and economic difficulties which have held him back and the disease which has disfigured him. His impulsiveness is well shown by his history. He is inclined to brood over his difficulties; his anxiety and desire for success reach an obsessional pitch at times. Some of his worries have definitely shown an obsessional character.

### Diagnosis: Progress

The case was diagnosed as one of anxiety, alopecia areata, neurofibromatosis, and auricular fibrillation.

Quinidine therapy was started soon after admission, and when the dose had reached 25 gr. a day the patient's cardiac rhythm switched to normal (Figs. 2 and 3). He was discharged on July 9, 1943, on a maintenance dose of 5 gr. of quinidine twice daily, which has been continued till now except for one month when, unknown to him, aspirin was substituted for his quinidine. He had no further fibrillation until Dec., 1943, when his cardiac rhythm became irregular again, after an attack of influenza. His heart was quickly converted to a normal rhythm with 20 gr. of quinidine in the day.

### Comment

Von Recklinghausen's disease is characterized by neurofibromata and by abnormal pigmentation, as described in this man. These café-au-lait patches and diffuse frecklings are regarded as *formes frustes* of the disease (Parkes Weber, 1909) when they appear in the relations of those suffering from its fully developed forms. The disease is now thought to be inherited as a Mendelian dominant. More interesting than the disease itself are the abnormalities which are often associated with it. These are of great variety, and include mental, endocrine, autonomic, and skeletal disorders: they have been reviewed in a paper by Levin and Behrman (1940). Although defective development of pubic hair is mentioned in that review, there is no report, either in this or in other papers, of an associated alopecia areata. Auricular fibrillation has once before been described (Clarke and Wakefield, 1926) in association with neurofibromatosis, and these authors attribute it to an involvement of the vagus nerve by the tumours. No necropsy was obtained on their patient, but, according to them, the vagus nerve is the commonest of the cranial nerves to be involved by neurofibromata. It is difficult to believe that the auricular fibrillation in our patient could have been due to implication of any part of the autonomic system by the tumours, since quinidine has returned his heart's rhythm to normal, and the rhythm has remained regular even when the quinidine has been stopped. It is simpler to postulate that the auricular fibrillation and the alopecia areata are related to the neurofibromatosis in the same way as are the vast array of associated disorders already described in the literature—and that is, at a genetic level.

Levin and Behrman quote the views of Pende (supported by "many learned arguments"), who in 1910 suggested that neurofibromatosis has a place in a large group of endocrine-sympathetic dystrophies, among which he also included scleroderma and painful lipomatosis. For the production of these conditions two factors are required:

- (1) A *constitutional factor*, represented by an abnormality of the endocrine-sympathetic system, which may be hereditary, intra-uterine, or extra-uterine during the period of growth; and
- (2) A *precipitating factor*, such as shock, trauma, toxins, or infection, which through its effects on the endocrine-sympathetic system acts as a stimulus to embryonal elements of the autonomic system in the skin.

This appears to us as satisfactory an explanation of the aetiology of neurofibromatosis as can at present be attempted, and it can be similarly applied to alopecia areata and to idiopathic auricular fibrillation. Alopecia areata has been related to emotional disturbances by numerous observers. This association has been denied with equal frequency. In our

experience of alopecia areata it has not been difficult, in both children and adults, to demonstrate a preceding emotional stress. Auricular fibrillation is associated with mitral stenosis, with thyrotoxicosis, and with myocardial degeneration. None of these conditions was present in our patient. Distinct from these varieties is another group called "paroxysmal auricular fibrillation." It is characteristic of these paroxysms that they last only a few hours or days, that they recur frequently, and that they are corrected to a normal rhythm with ease and safety by quinidine therapy. It is difficult to define as paroxysmal a condition which has persisted for eighteen months, as in our patient. When auricular fibrillation is unassociated with any organic disease and when it is preceded by adequate emotional tension, as in this man, it is reasonable to name it a cardiac neurosis.

This man's illness illustrates the varied factors—genetic, constitutional, psychological, environmental, and mechanistic—which we seek to assess in an evaluation of disease in man, but it also indicates how remote is the day of full comprehension. The link between the emotion which fails to find its appropriate physical discharge and the consequent physical disorder is usually assumed to be the vegetative nervous system; while this path is probable, the endocrine system offers an alternative mechanism. Both alopecia and auricular fibrillation are sometimes associated with endocrine disorder. We are far from a coherent conception of the mechanism by which emotional stress is translated into physical disorder. Not to seek this link, however, or, worse, to ignore its existence, is a heretical denial of the integrity of mind and body.

The present controversy between those who support the "biological" approach to aetiology ("What sort of man is this, and why did he become ill in the way he did?") and those who are preoccupied with mechanism ("What has the patient got?") implies a schism in diagnosis and therapy which is quite unreal. In our patient it was possible to define closely but one of the faulty mechanisms involved (i.e., auricular fibrillation), and here it was easy to intervene to the man's great advantage. While the biological approach to aetiology had in this case none of this immediate practical quality, yet it contributed to a fuller understanding of the sufferer and his disorder. The physician cannot disdain any approach which increases either his understanding or his capacity to help his patient.

We are grateful to Dr. J. T. Ingram, dermatologist to the General Infirmary at Leeds, for his expert help and criticism in the preparation of this paper, and to Dr. G. R. Osborn, pathologist to the Derbyshire Royal Infirmary, for the photograph and the report on the sections of the tumour.

## REFERENCES

- Clarke, G. F., and Wakefield, E. G. (1926). *Arch. Derm. Syph.*, Chicago, 13, 806.  
Levin, O. L., and Behrman, H. T. (1940). *Ibid.*, 41, 480.  
Weber, F. Parkes (1909). *Brit. J. Derm.*, 21, 49.

## A MILK-BORNE OUTBREAK OF GASTRO-ENTERITIS DUE TO SALMONELLA DUBLIN

BY

P. L. SUTHERLAND, D.Sc., M.B., Ch.B.

Pathologist and Bacteriologist, West Riding County Council

AND

F. M. BERGER, M.D.

Assistant Bacteriologist, West Riding County Council

On Aug. 19, 1943, the County Medical Officer of the West Riding of Yorkshire was informed that the practitioners in Knaresborough Urban District had throughout that day been called in to attend to numerous cases of sickness and diarrhoea. Inquiry by the local medical officer of health showed that all the cases had occurred in households supplied with milk from Farm G, situated at a village about two miles distant in an adjoining rural district. Simultaneously cases had occurred among residents at the farm. It therefore seemed that the disease was conveyed by the milk distributed from Farm G. Subsequent investigation proved that the outbreak was caused by *Salmonella dublin*, that the vehicle of infection was milk from Farm G, and that the source of infection was an apparently healthy cow which was a carrier of the organism.

## Symptoms

The onset of the disease was sudden, with sickness or actual vomiting, diarrhoea, headache, and fever ranging from 100° to 102° F. The diarrhoea was profuse, but there was no blood or mucus in the motions. The febrile period lasted for about three days at the longest. A profuse herpetic eruption on the lips and nose was noted in a small proportion of cases. One patient complained of persistent headache for some days during convalescence. Many cases were very mild, and some patients were not confined to bed or were confined to bed only for a day. There were no deaths.

On Aug. 29 a baby 2 months old died of meningitis, but unfortunately no bacteriological or post-mortem examination was made. This child, which was breast-fed, did not suffer from diarrhoea. It was a member of a household of five persons supplied with milk from Farm G. One member of the household (not the mother) had been ill with diarrhoea about Aug. 19. This case is noted because Smith (1934) has described two sporadic cases of meningitis in children due to *S. dublin*.

## Incubation Period

Cases occurred among the residents at a hostel for evacuee children, from particulars of which the duration of the incubation period was determined. The circumstances also confirmed the fact that the outbreak was milk-borne. At the hostel there were 7 children and a staff consisting of a matron, a nurse, and a cook. A daily charwoman was also employed. At the time of the outbreak a friend of the nurse was staying there. The hostel was supplied with milk from Farm G, and the residents, with the exception of the matron and cook, had milk at about 11 a.m. on Aug. 18. The charwoman also had milk on that day. About 2 a.m. on the 19th three of the children complained of sickness and diarrhoea, and by 8 a.m. all the children, the nurse, and her friend were ill. The charwoman, on arriving at the hostel that morning, complained that she had suffered from sickness and diarrhoea during the night. The matron and cook, who did not take milk, remained well.

The interval of time between the consumption of milk and the onset of symptoms varied from 14 to 20 hours. This relatively long incubation period suggested infection with living *Salmonella* organisms.

## Outbreak in the Urban District

As the practitioners were requested to notify cases of sickness and diarrhoea it was possible to estimate approximately the magnitude of the outbreak. The total number of cases notified was 162, and 79 households were involved. Some of the known cases were very mild, and it is therefore probable that there were many more cases, which did not come to light as a doctor was not called in. The date of onset of the illness was stated to be Aug. 18 in 2 cases, Aug. 19 in 143 cases, and Aug. 20 in 15 cases; in 2 cases the date was not given. The age and sex incidence is shown in Table 1.

TABLE 1.—Age and Sex Incidence of Cases of Gastro-enteritis notified in the Knaresborough Urban District

Age	Cases	Females	Males
Under 5	35	21	14
5-9	23	12	11
10-14	16	4	12
15-24	24	19	5
25-34	23	21	2
35-44	15	10	5
45 and over	26	17	9
Totals	162	104	58

## Outbreak at Farm G

On making investigations at the farm it was found that six persons were resident there: the farmer H. F., aged 70; his son-in-law T. P., aged 36; his three daughters, R. P., aged 36, J. B., aged 32, and W. F., aged 23; and his granddaughter, J. P., aged 9. Two farm labourers—H. R., aged 40, and C. K., aged 35—were employed, but lived with their families in the village and were supplied with milk from the farm. The farmer, his son-in-law, and his granddaughter were ill with sickness and diarrhoea. The other residents and the two labourers were well, and remained well. All the members of

the labourers' families, seven in number, were ill. Other cases were known to have occurred in the village among persons supplied with milk from the farm. Particulars of the cases connected with the farm are given in Table II.

TABLE II.—Particulars of Patients Resident at or Associated with the Farm

No.	Name	Sex	Age	Relation	Condition	Onset of Illness	Bacteriological Examination
1	H. F.	M	70	Farmer*	Ill	18/8, 9 p.m.	Positive
2	T. P.	M	36	Son-in-law*	Well	19/8, a.m.	Positive
3	R. P.	F	36	Daughter†	Well	—	Negative
4	J. B.	F	32	"	"	—	"
5	W. F.	F	23	"	"	—	"
6	J. P.	F	9	Grand-daughter	Ill	19/8, 4 a.m.	Positive
7	H. R.	M	40	Labourer*	Well	—	Negative
8	E. R.	F	44	Wife	Ill	18/8, p.m.	Positive
9	W. R.	F	19	Daughter	"	18/8, p.m.	Negative
10	H. R.	M	10	Son	"	18/8, p.m.	"
11	C. K.	M	35	Labourer	Well	—	"
12	E. K.	F	26	Wife	Ill	18/8, p.m.	Positive
13	J. K.	F	10	Daughter	"	18/8, p.m.	"
14	B. K.	F	7	"	"	18/8, p.m.	"
15	C. K.	M	2	Son	"	18/8, p.m.	"

Nos. 1 to 6 were resident at the farm; Nos. 7 to 15 were resident in the village.

\* Milker. † Milk distributor.

#### Production and Distribution of the Milk

At the farm there were 20 cows, two of which were dry. The cows were milked by the farmer, his son-in-law, and the labourer H. R. When the farmer and his son-in-law became ill the milking was continued by H. R., assisted by the other labourer, C. K. Milking was done by hand. The milk, of which about 36 gallons were produced daily, was distributed by the farmer's daughters R. P. and W. F. to about 600 registered customers in the urban district and 12 in the rural district, the number of households supplied being about 200. There was only one calf on the farm, and neither the calf nor any of the cows showed evidence or gave a history of enteritis. None of the cows had been recently added to the herd. There were no pigs at the farm and there had been no disease among the poultry.

#### Procedures taken to Prevent the Spread of Infection

When the farm was visited on the morning of Aug. 20 the evidence strongly pointed to the milk as the vehicle of infection, and the first problem which arose and required immediate decision was what steps should be taken with regard to the milk to preclude the possibility of the occurrence of further cases. At that time there was no bacteriological proof that the milk was infected. The results of bacteriological examinations, which had been started very late on the previous evening, had proceeded only far enough to indicate that a pathogenic organism was present in the faeces of some of the cases.

Two courses were open—namely, to prohibit the use of the milk for human consumption or to allow it to be used only after pasteurization and to be distributed only by persons unconnected with the farm. The former procedure would, if adopted, have involved the waste of a considerable amount of milk, which is a valuable and at the present time not too abundant food, besides causing financial loss to the farmer. In view of these considerations it was decided to allow the milk to be used after pasteurization.

On the afternoon of the same day arrangements were made with the local officer of the Ministry of Food and with the Milk-Marketing Board to collect the milk at the farm, take it direct to a pasteurizing plant, and distribute it from there after pasteurization. By this arrangement the milk did not return to the farm. A supply was provided for the farmer's customers, and this was distributed by another retailer. The last delivery of milk direct from the farm was on the morning of Aug. 20. It was also arranged to examine the milk produced at the farm and specimens of faeces and urine of all persons resident at or connected with the farm. Those who had the disease were prohibited from taking part in the milking until declared free from infection, and the milkers were warned to exercise care in the cleansing of their hands and the dairy utensils.

A request was made to the Ministry of Agriculture to have the herd examined by one of its officers. An examination was

made on Aug. 23, and the veterinary officer reported that "several of the cows were found to be affected with cowpox, in some cases very severely, and the teats in these cases were a mass of sores, some of them being wet and runny." The farmer was advised as to treatment of the condition, and was requested to call in his own veterinary surgeon to continue the treatment; to this he agreed. When it was subsequently found that a cow was excreting the organism in the dung, this animal was excluded from the herd and instructions were given not to allow its milk to be mixed with that taken to the pasteurizing plant or to be used for human consumption or fed to animals unless it had previously been boiled.

#### Bacteriological Examination

On Aug. 19 specimens of faeces from 8 patients in the urban district and a specimen of milk collected at the hostel were received for examination. Of these, 7 specimens of faeces and the specimen of milk were found to contain an organism of the *Salmonella* group. The milk was very heavily infected. Two loopfuls spread on a MacConkey plate showed after 24 hours' incubation more non-lactose-fermenting colonies than colonies of coliform organisms. The pathogenic organism was motile and fermented glucose, mannitol, and dulcitol with formation of acid and gas, but gas was at first not abundant. It did not ferment lactose or saccharose; it formed hydrogen sulphide but no indole. It was strongly agglutinated by polyvalent *Salmonella* serum.

The serological identification of the organism proved difficult. It was equally well agglutinated on the slide by typhosum O serum and by *aertrycke* O serum. This was probably due to the presence of an overlapping O antigen XII (Topley and Wilson, 1936). Agglutination to titre carried out in tubes showed a slightly higher titre with typhosum O serum. A weak but definite reaction with *Gaertner* H serum indicated that the organism probably belonged to the enteritidis subgroup. As the organism could not be placed nearer with the sera available, cultures isolated from one of the patients and from the milk were sent to Dr. Joan Taylor, of the *Salmonella* Reference Laboratory, Oxford, who identified them as *Salmonella dublin*.

The examination of the specimen of milk which was collected at the hostel was of interest as it showed not only that the milk was the vehicle of infection but also that it must have been infected on at least two occasions. The specimen was a sample of milk delivered at the hostel on the morning of Aug. 19. At that time all the children, the nurse, and her friend were ill and did not take any of that milk. The milk had not been handled by any of the inmates except the matron and cook, who had not been ill, and therefore it is very unlikely that it could have become infected after delivery at the hostel.

Specimens of faeces and urine from all the residents at the farm and from the two farm labourers and the members of their families were also examined. The organism was shown to be present in the faeces or urine of all the residents at the farm who had been ill, and of five of the seven members of the labourers' families who had been ill. It was found nine times in specimens of faeces and three times in specimens of urine. Cultures made from the material collected from the lesions of the cows suffering from cowpox showed only coagulase-positive golden staphylococci. Repeated examination of samples of bulked milk collected at the farm, of the water supply of the farm, and of water in a stagnant pond on the farm all gave negative results. Repeated examinations of the dung of the calf were also negative.

It is known that infections due to *S. dublin* are especially associated with calves and cattle (Savage, 1940). Conybeare and Thornton (1938) isolated *S. dublin* from the dung of an apparently healthy cow which was shown to have a high serum-agglutinin titre for that organism. In the present outbreak it was impracticable, owing to transport and other difficulties, to collect specimens of dung and blood of all members of the herd. It was possible, however, to obtain samples of milk from individual cows, and these were examined culturally and serologically. The cultures were negative in every case, but evidence of infection was obtained by investigating the agglutinin content of the milk. The individual samples of milk were mixed with rennet and the mixture was allowed

to stand on the bench until the whey had separated. Twofold dilutions of whey were prepared with 0.85% sodium chloride solution in a volume of 0.5 ml., the dilutions ranging from 1 in 2 to 1 in 256. Saline controls and normal milk controls were also set up at the time of the experiment. To all the tubes 0.5 ml. of a suspension of *S. dublin* was added. The opacity of this suspension was adjusted with normal saline solution until it was approximately the same as that of a standard suspension. The suspension was preserved by the addition of 0.4% of chloroform. All the tubes were incubated at 50° C. for two hours and allowed to stand on the bench overnight. The milk of Cow No. 10 was found to contain agglutinins for *S. dublin*, the titre being 1 in 32. The test was repeated with another specimen of milk of Cow No. 10, and a titre of 1 in 64 was obtained. The agglutination was of the flaky H type. The whey obtained from the milk of all the other cows did not agglutinate *S. dublin* in a dilution of 1 in 4. Subsequent examination of the dung of Cow No. 10 showed the presence of *S. dublin*. Two samples of dung were examined: in both an almost pure culture of *S. dublin* was obtained on direct plating on Leifson's medium, and many colonies were also detected on MacConkey medium. The identity of the organism was confirmed by Dr. Joan Taylor.

### Discussion

Three extensive outbreaks of milk-borne gastro-enteritis due to *S. dublin* have been reported in this country. In the first two outbreaks, which occurred in Dundee in 1926 and 1927 and were reported by Tulloch (1939), the infection was traced to a cow that was ill. In the Wilton outbreak (Conybeare and Thornton, 1938) and in the present one, however, the absence of evidence of illness among the cows presented the problem of finding the animal carrier. Conybeare and Thornton discovered the carrier by examining the antibody content of blood samples of individual cows. They found that about 50% of sera gave an agglutinin titre of 1 in 25. The sera of three cows gave a titre of 1 in 400 or higher, and the dung obtained from one of these cows yielded *S. dublin* on cultivation.

In the present outbreak the search for the carrier was made by determining the agglutinin content of the milk. It was found that milk from healthy cows did not contain any agglutinins for *S. dublin* and that even a low titre of agglutinins in milk was indicative of infection. It appears, therefore, that milk is a suitable material for serological tracing of carriers of *S. dublin* not only because it is more easily obtained than blood but also because non-specific agglutinins for *S. dublin* are not usually present.

How the milk became the vehicle of infection is a matter of conjecture. As the dung of the carrier cow contained the organism in large numbers it seems probable that the milk became contaminated as a result of faulty methods of production at the farm. On the other hand, although the milk of this cow was repeatedly examined with negative results, the possibility of intermittent excretion of *S. dublin* in the milk cannot be excluded.

### Summary

An outbreak of milk-borne gastro-enteritis due to *Salmonella dublin* is described. At least 162 people were affected. There were no deaths. The source of infection was an apparently healthy cow which was excreting large numbers of the organism in the dung. The carrier cow was identified by the agglutinin content of its milk. The milk of normal cows did not possess any agglutinins for *S. dublin*.

We are indebted to Dr. T. N. V. Potts, the County Medical Officer, and to Drs. D. F. Dobson and J. W. Forbes of Knaresborough for permission to publish an account of the outbreak. We thank the Divisional Inspector of the Ministry of Agriculture, Mr. W. T. MacGregor, and his assistant, Mr. J. M. McKellar; the County Sanitary Inspector, Mr. A. Brook; the local Sanitary Inspectors, Mr. H. Eatough and Mr. A. E. W. Lupton, for co-operation and assistance in the investigation; and also Mr. S. J. Denyer, Chief Technician at the County Laboratory, for technical assistance.

### REFERENCES

- Conybeare, E. T., and Thornton, L. H. D. (1938). Reports on Public Health and Medical Subjects, No. 82, London.  
Savage, W. (1940). *Proc. roy. Soc. Med.*, 33, 357.  
Smith, J. (1934). *J. Hyg., Camb.*, 34, 351.  
Topley, W. W. C., and Wilson, G. S. (1936). *Principles of Bacteriology and Immunology*, 2nd ed., p. 551, London.  
Tulloch, W. J. (1939). *J. Hyg., Camb.*, 39, 324.

## THE EARLY TREATMENT OF WOUNDS OF THE CHEST IN THE MIDDLE EAST

BY

RONALD BODLEY SCOTT, D.M., F.R.C.P.

Temporary Lieut.-Col., R.A.M.C.; Officer in Charge of a Medical Division

The provision by the Army Medical Services of special team for the treatment of wounds of the chest demands an explanation, if not an apology, from the general physician who has the temerity to express his opinions on this subject. During the first and second battles of El Alamein, in July and Oct., 1942 a number of battle casualties with wounds of the chest were admitted to a general hospital, at that time less than a hundred miles behind the line. This hospital played the part of a casualty clearing station, although retaining greater facilities for investigation and treatment, and the management of these cases fell to my lot as medical specialist. Thus this paper records the experience of a general physician in the immediate treatment of thoracic casualties without the expert assistance of a thoracic surgeon. The problems were those commonly confronting the medical specialist in a casualty clearing station, and they differed from the problems of the thoracic team in the more leisured atmosphere of the base hospital. Time was limited: only treatment urgently indicated could be undertaken; and the immediate aim was to ensure that the patient had recovered sufficiently to withstand the rigours of evacuation to the chest centre.

### The Material

The material which forms the basis for these observations consists of 127 consecutive battle casualties with penetrating wounds of the chest. From the first battle wounded were admitted unselected, but from the second the hospital received only those whose condition was too precarious to allow of immediate evacuation. As this type of casualty is often gravely ill, chest wounds formed 13% of the second group and only 4.6% of the first. The majority had passed through a surgical unit, but treatment had commonly been confined to dressing and the administration of morphine. 46% were admitted within 41 hours and 72% within 72 hours of wounding. In all cases radiographs were taken, and it was possible to hold patients in hospital for as long as ten days when necessary; in these respects conditions differed from those usually operative in a casualty clearing station. No "follow-up" was practicable, but through the courtesy of Major A. Logan, R.A.M.C., O.C. No. 1 Surgical Team for Chest Surgery, the ultimate fate of the majority is known.

An analysis of the arms of the Service from which these casualties were drawn shows, as would be expected, that the infantry suffered most heavily. The composition of the series

TABLE I.—The Nature of Missile in 63 Cases of Penetrating Wound of the Chest

Nature of Missile	No. of Cases
Shell fragment	34 (54.0%)
Bullet (rifle, m.g., or revolver)	17 (27.0%)
Mortar-bomb fragment	6 (9.5%)
Land-mine fragment	3 (4.7%)
Aerial-bomb fragment	1 (1.6%)
Hand-grenade fragment	1 (1.6%)
Unexploded 50-mm. A.P. shell	1 (1.6%)

was: infantry, 72.5%; artillery, 13.4%; R.A.C., 3.9%; R.E. 3.9%; R.A.S.C., 3.9%; R.A.O.C., 1.6%; R.C.O.S., 0.8%. The nature of the missile in the 63 cases in which it was known is set out in Table I.

TABLE II.—The Intrathoracic Condition, on Admission to Hospital of 127 Cases of Penetrating Wounds of the Chest

Intrathoracic Condition	No. of Cases	No. Fatal
Haemothorax and haemopneumothorax	88 (69.4%)	5
Pneumothorax	5 (3.9%)	—
Pulmonary haemaloma	14 (11.0%)	—
Atelectasis	5 (3.9%)	—
Lung abscess	2 (1.6%)	1
Thoraco-abdominal injuries	13 (10.2%)	6



The patient with a penetrating wound of the chest presents two problems: the parietal breach of surface, and the visceral commotion caused by the missile. In this paper the second problem is considered first. The intrathoracic consequences of these wounds are summarized in Table II, and are discussed more fully in the following paragraphs.

#### Haemothorax and Haemopneumothorax

The common sequel of a penetrating wound of the thorax is effusion of blood into the pleural cavity. The blood is usually derived from the damaged lung, and in only one of these cases was there evidence of haemorrhage from the parietes. The injury to the lung is followed by the formation of a pulmonary haematoma; probably bleeding is seldom of long duration and is checked by pulmonary collapse unless it be due to rupture of a large vessel. The presence of blood in the pleural cavity provokes a serous reaction of varying magnitude; the degree as well as the variability of this process is shown by the haemoglobin content and erythrocyte counts of haemothorax fluids in Table III.

TABLE III.—*Haemoglobin Content and Erythrocyte Count of Haemothorax Fluid from 9 Cases aspirated on Various Days after Wounding*

Day after Wounding	Haemoglobin %	Erythrocytes (millions c.m.m.)
0	110	—
4	27	1.04
5	32	1.15
6	20	—
6	70	3.20
9	60	3.17
10	19	0.94
10	25	1.04
12	70	—

With the blood, in many cases, air will enter the pleural cavity, although absorption must commonly be rapid, for in this series only 14 showed the radiographic features of haemopneumothorax on admission to hospital. This air may enter the pleural space through either the parietal or the visceral wound; and of these 88 cases, the wounds of 32 were noted to be "sucking" shortly after infliction. Continued escape of air from a wound of the lung was rare, and only one showed, in addition to a haemothorax, the features of a tension pneumothorax.

At this early stage infection was the only serious complication. It occurred in nine of these 88 cases, and in each instance was established within seven days of wounding; in all but one an infected fluid was found at the first aspiration; in each case *Str. haemolyticus* was the responsible organism. So far as could be determined none became infected after evacuation. It is worthy of remark that the haemothorax became infected in eight of the 32 cases with "sucking" wounds and in only one of the remaining 56. In this latter case infection appeared after the first aspiration; later this patient died, and post-mortem examination showed two splintered ribs with bony fragments driven into the lung, and around these fragments a suppurating pulmonary haematoma. In this series a persistent pleuro-cutaneous communication was the most important single factor in determining infection. The only other significant complication was the presence, in one case, of mediastinal emphysema producing cervical venous engorgement but no symptoms.

The ideal of treatment in traumatic haemothorax is to empty the pleural cavity. The circumstances in which these patients were treated made it possible only to aspirate those who showed a mechanical indication or features suggestive of infection. Where there was no dyspnoea, fever, or tachycardia, and where the clinical and radiographic evidence pointed only to a small effusion, the patient was transferred to the special chest unit after four or five days. Aspiration was performed in 58 cases, and in many of these on several occasions. Air replacement was done only when indicated by symptoms arising during the procedure or to facilitate adequate aspiration. There was no suggestion that fresh haemorrhage was promoted by removal of large quantities of fluid within a day or two of wounding; this danger appears hypothetical. In one case 3.870 c.cm. was withdrawn without replacement by air and with no results other than beneficial. Although aspiration is usually a simple procedure, in a number of cases the fluid becomes loculated, and

radiographs show multiple fluid levels; in such it was often necessary to aspirate each loculus separately after location by radiograph. With infected haemothorax repeated aspiration was undertaken in the hope that the patient would improve enough to permit his transfer; but in five cases closed drainage by intercostal catheter was necessary.

In addition to aspiration in as many cases as circumstances allowed, all patients received 4 g. of sulphanilamide daily for six days and, when anaemia indicated, blood transfusion. It was possible to keep most cases in hospital for a week and to evacuate them only when temperature and pulse frequency had been normal for three or four days, and when orthopnoea had disappeared.

Of these 88 cases of haemothorax five were fatal before evacuation; so far as could be determined none died subsequently. The post-mortem findings in these fatal cases are given in Table IV.

TABLE IV.—*Post-mortem Findings in 5 Fatal Cases of Haemothorax*

Case	Day of Death after		Post-mortem Findings	Operation
	Wounding	Admission		
1	3	1	Haemothorax, bilateral, uninfected; perf. of bladder and small bowel	Laparotomy; repair
2	7	3	Haemothorax, right, infected; mediastinal emphysema left eye excised	Aspiration; excision left eye
3	13	6	Haemothorax, right, infected; streptococcal stomatitis	Aspiration; intercostal drainage
4	7	2	Haemothorax, right, infected; fracture 2nd and 3rd ribs, right; abscess right upper lobe	Aspiration
5	11	5	Haemothorax, left, infected; fracture sternum and 2nd rib, left; osteomyelitis of sternum	Aspiration

#### Pneumothorax

Five cases presented the clinical and radiographic features of pneumothorax without effusion of blood into the pleural space. Of these, only one resulted from a "sucking" wound; the remainder were due to small fragments of hand grenade or mortar bomb. In one case the wound of entry was in the neck, and the missile had traversed the mediastinum to rest in the right lung; in this instance mediastinal emphysema was associated with the pneumothorax. In only one was it necessary to withdraw air from the pleural cavity, and this procedure did not require repetition. The other patients did not need special treatment.

#### Pulmonary Haematoma

On x-ray examination 14 cases showed circumscribed shadows in the lung fields without evidence of pleural effusion. These opacities were roughly circular, and varied in diameter from 5 to 12 cm.; in the centre of so a metallic foreign body was visible. A pleural friction rub was heard in three cases seen shortly after wounding. Subsequent radiographs showed decrease in size and density of the shadow, and the appearances were interpreted as due to pulmonary haematomata. Two cases with large opacities showed later a transient jaundice without choloria, which was taken to indicate absorption of the effused blood. In one there was also a small pneumothorax with mediastinal emphysema. The distinction between pulmonary haematoma and haemothorax is difficult without radiography.

At the stage under consideration no treatment was required for the intrathoracic lesion. A sequel which had been met with in previous cases was the late development of a serous pleural effusion; it was noted in none of the present group while under my observation.

#### Lung Abscess

There were 2 examples of lung abscess in this series. It is likely that, in both, infected haematoma of the lung would describe the lesion more precisely; each was characterized by a fistulous communication between an infected parietal wound and the abscess cavity. Both patients had received extensive surgical toilet of the wound with suture in a forward unit; in one the lung had been secured to the chest wall. After admission to hospital, removal of sutures from the superficial wound led to improvement sufficient to permit evacuation. One patient died a month later.

### Atelectasis

It was a common experience to be called to see men with wounds of the chest, often associated with fracture of ribs or scapula, in whom urgent dyspnoea had convinced the medical officer that the pleura had been penetrated. In many no penetrating wound was found, but pain had led to shallow tachypnoea with voluntary suppression of cough; bronchial secretions had accumulated and rhonchi were audible throughout both lungs. In these cases local measures to relieve pain—of which the most important was removal of skin sutures—a dose of morphine, and persuasion to cough resulted in rapid emptying of the respiratory passages and the disappearance of distress. Untreated, atelectasis with subsequent infection was almost inevitable. In 5 cases with penetrating wounds the radiological findings were limited to those of collapse of one or other lower lobe. It was common, even with extensive intrathoracic damage, to find a high diaphragmatic shadow, and it seems likely that atelectasis from bronchial obstruction by aspirated blood or secretion is often a sequel of thoracic wounds. In three cases with haemothorax there was radio-graphic evidence of collapse of the contralateral lower lobe. Treatment of these five cases was confined to attempts to moderate the pain and to promote drainage by posture; infection was discouraged with sulphapyridine. In all five cases uneventful re-aeration was achieved.

This clinical picture is familiar in patients with simple fracture of a rib; its greater frequency and importance in those with wounds of the chest must serve for excuse if the point appears laboured. The chances of its occurrence can be minimized by relief of pain, and this should be achieved by local measures so far as is possible: a tightly sutured wound of the chest is often agonizing. Limitation of thoracic movement by exuberant strapping and prolonged inhibition of the cough reflex with morphine are undoubtedly important factors in its production.

### Thoraco-abdominal Injuries

In 13 cases the missile had traversed both the thoracic and the abdominal cavities; six of these patients died. Details are not pertinent; but, where the entry wound was left-sided, intestinal perforation and, consequently, death was frequent. Hernia through the diaphragmatic wound was seen twice; in three a missile lodged in the upper part of the right lobe of the liver had provoked a sero-sanguineous subphrenic effusion.

The present relevance of this group of cases lies in the diagnostic difficulty they offer. This difficulty is increased by the frequent association of simple penetrating wounds of the thorax with abdominal pain, rigidity, and tenderness—symptoms which in four cases of uncomplicated haemothorax led to fruitless laparotomy. Survival depends on early exploration, and when the entry wound is in the lower third of the chest suspicions of abdominal as well as of thoracic injuries should be aroused.

### Treatment of the Parietal Wound

The observations of a physician on this technical aspect of surgery will be regarded probably as worthless and certainly as impertinent. Thus it is with trepidation that these comments are offered, and because of the effect of the initial treatment of the parietal wound on the patient's subsequent course.

At this time there was little uniformity in the practice of surgeons in the forward areas, and Table V sets out the treatment

TABLE V—Initial Treatment of Parietal Wounds in 127 Penetrating Injuries of the Chest

Dressing	No. of Cases
Simple dressing	80 (62.9%)
Strapping over vaselined-gauze pack	9 (7.1%)
Excision and strapping over vaselined-gauze pack	8 (6.3%)
Suture without excision	11 (8.6%)
Excision and suture	10 (7.8%)
Excision and suture over vaselined-gauze pack	4 (3.2%)
Exploration, excision, and suture	5 (3.9%)

applied to the wounds in the present series before admission to hospital. Suture, with or without excision, was almost invariably followed by infection of the chest wall; it always led to a painful wound and the possibilities discussed under the heading of atelectasis. The practice latterly was to remove skin

sutures immediately the patient was admitted to hospital. In three instances a sutured wound broke down to leave a pleuro-cutaneous fistula; this was particularly likely to happen when the edges of the wound were approximated under tension and the intrapleural pressure was raised by a large haemothorax. Two of five cases in which the wounds were explored and sutured subsequently developed infection of the lung.

From experience with this group of cases it was concluded that the immediate treatment of the parietal wound should be as conservative as possible. The indications are to control haemorrhage from the chest wall and to close an open pneumothorax. If there is no serious haemorrhage and the wound is not "sucking," simple dressing is adequate; if the wound is "sucking" it should be closed by strapping over an air-tight pad and the intrapleural pressure lowered by aspiration of the haemothorax. The strapping should not hamper breathing by encompassing the whole chest.

In three cases which reached hospital with an infected haemothorax and a parietal wound that had broken down, immediate closed drainage through a catheter inserted at a distance from the wound was the only way the open pneumothorax could be controlled.

Immediate exploration should be limited to cases in which haemorrhage demands it, and perhaps to those in which fragments of bone have been driven into the lung; for this type of injury is likely to be followed by pulmonary suppuration. Uncritical exploration carries the additional danger of converting a closed haemothorax into an open haemopneumothorax—an event which invites the entry of infection.

### Summary

The management of 127 cases with penetrating wounds of the thorax, seen in a hospital working as a casualty clearing station, is described.

The intrathoracic sequels of these wounds were: haemothorax, 69.4%; pneumothorax, 3.9%; pulmonary haematoma, 11%; atelectasis, 3.9%; lung abscess, 1.6%; thoraco-abdominal injuries, 10.2%.

The early treatment of these conditions is discussed.

A plea is entered for the conservative treatment of the parietal thoracic wound in casualties of this type.

My thanks are due to the Director of Medical Services, Middle East Force, for permission to publish this paper.

## VISCERAL LEISHMANIASIS (KALA-AZAR) IN AN ADULT CONTRACTED IN MALTA

BY

F. E. LIPSCOMB, M.R.C.S., L.R.C.P., D.P.H., D.T.M.&H.  
Wing Commander, R.A.F.

AND

M. O. J. GIBSON, M.B., B.Chir., M.R.C.P.  
Temporary Squadron Leader, R.A.F.V.R.

Although the occurrence in adults of kala-azar contracted in Malta is categorically denied by Neumann (1930), four cases have been recorded in which the history and the demonstration of leishmania leave no possible doubt as to the identity of the disease or that it was contracted in Malta (Bassett-Smith, 1913, 1914; Kerr, 1918; Walker and Gibson, 1933; Gibson and O'Flynn, 1934). Four further cases have been reported in which the diagnosis was proved but in which the possibility of infection having occurred elsewhere than in Malta cannot be absolutely excluded (Ward, 1916; Kerr, 1918; Bassett-Smith, 1923).

A fifth case falling within the former category has recently been under our care in a Royal Air Force hospital in England, and appears worthy of record not so much on account of its rarity as because it serves to illustrate how an easy diagnosis can be missed through failure to bear in mind the possibility of tropical disease in men returning from service abroad. In this case the splenomegaly, anaemia, and leucopenia with a low-grade pyrexia in a patient recently returned from Malta immediately suggested leishmaniasis, and enabled a positive diagnosis to be made and treatment to be started without delay.

## Case Report

The patient was an air-gunner who in 1938, at the age of 20, proceeded to Malta, where he remained until he returned to this country at the end of his tour of duty in Jan., 1942. Although he had lived in Egypt and New Zealand in early childhood (1919 to 1926), he had not subsequently been out of England until his present tour, during which Malta was the only place visited. He remained in Malta until Dec., 1940, when he was admitted to hospital with a urethral discharge which proved to be non-gonococcal and very resistant to treatment. This persisted until July, 1941, and has relapsed periodically since then. In July, 1941, he started to have vague headaches, night sweats, and a troublesome cough, and was readmitted to hospital. Here he was found to have slight fever with a mild anaemia (4.6 millions) and leucopenia (5,800). Radiographs of the chest were normal, but it was noted that 2 st. in weight had been lost in the preceding four months. No definite diagnosis appears to have been made. It is of interest to note that during the preceding six months he had often been sleeping in air-raid shelters in various parts of the island without a sandfly net, that he recalls being repeatedly bitten by sandflies, and that he was in the habit of allowing a dog to sleep on his bed.

By the early autumn of 1941 he was flying again, but still felt "groggy," complaining of a dry irritating cough, frequent night sweats, catarrh, and tender epitrochlear, cervical, and inguinal glands. Several medical officers of all three fighting Services to whom he reported these symptoms did not apparently take them seriously, and he felt that he was suspected of malingering—so much so that he became embittered and lost confidence in himself, to the further detriment of his efficiency in the air.

After several short periods of non-effectiveness he returned direct to England at the end of his tour in Jan., 1942. During disembarkation leave he called in a local practitioner, who, after making an initial diagnosis of influenza, referred him to the medical consultant at a neighbouring civilian hospital. Here all investigations are stated to have proved negative (although a leucopenia of 5,600 with a relative lymphocytosis of 42% was recorded), and he was certified fit to return to duty.

On April 7, 1942, the patient was admitted to a Royal Air Force hospital for investigation. On admission he was seen to be pale, thin, worried-looking, and obviously ill. He had a dry irritating cough which kept him (and the rest of the ward) awake at night. The scanty sputum was repeatedly negative for tubercle bacilli, but there was clinical and radiological evidence of an imperfectly resolved right basal pneumonia. A few discrete cervical, epitrochlear, and inguinal glands were palpable and the gums were tender and bled easily. The spleen was enlarged three fingerbreadths below the costal margin, but was soft and the edge was not easily palpated. No other clinical abnormalities were found. There was a marked anaemia (3.5 millions, Hb 8.7 g.), and leucopenia (3,600) with a relative lymphocytosis of 47%. No leishmania or plasmodia were found in blood smears. The erythrocyte sedimentation rate (Westergren) was 60 mm. in the first hour. Agglutination tests against *Br. melitensis* and *Br. abortus*, Kahn test, Wassermann reaction, and gonococcal-fixation tests were all negative. Napier's formal-gel test became positive only after several hours. A provisional diagnosis of kala-azar was made.

After ten days of postural drainage the pneumonia had completely resolved, but pyrexia persisted, reaching 100–101° F. in the evening and falling to 98–99° F. in the morning. The typical "double peak" was rarely apparent, but the temperature was not recorded throughout the night.

On April 24 sternal puncture was performed and very numerous leishmania were found in the marrow smear, and were successfully cultured on Adler's medium. Leishmania were cultured also from venous blood at this time, although they were not found then or at any other period in blood smears even after prolonged search. At the same time a gland was removed from the groin, smears and sections of which revealed numerous leishmania. Sections of skin removed with the gland showed no leishmania.

From May 5 to 16 a course of 2.5 g. of neostam was given in daily intravenous injections, increasing from 0.05 g. to 0.3 g. The full course of 4.5 g. could not be completed owing to the distressing cough (chiefly at night), which was quite uncontrollable even with acroin. During the week following this course the fever declined somewhat, the spleen became appreciably harder and smaller, and the leucocyte count improved slightly (4,300). On May 29 numerous leishmania were still present in smears of sternal marrow, and so between June 6 and 25 a further 1.85 g. of neostam was administered in doses not exceeding 0.2 g. With this dosage the cough was a good deal less troublesome. On June 30 only a few degenerate leishmania were seen in sternal marrow and there was further slight improvement in the leucocyte count (4,800) and in the general clinical condition, although there was occasional evening pyrexia. A month's sick leave was then granted before deciding on further treatment.

On his return to hospital on Aug. 6 there was no appreciable change in the clinical condition. He reported three rigors and some bleeding from the gums during the preceding week. There was still slight evening pyrexia, with a definite dusky pigmentation of the temples. The blood picture had deteriorated (R.B.C. 3.3 millions, Hb 10.2 g., W.B.C. 2,600). His weight remained unchanged. On Aug. 16 a course of sodium antimony gluconate was started. Daily intravenous injections were given until a total of 86 c.cm. had been administered over a period of 15 days. No cough or other toxic manifestation was observed. Three weeks later the leucocyte count had risen to 5,000, but the anaemia persisted (3.4 millions). An occasional evening pyrexia was recorded, but 99° F. was never exceeded. Another month's sick leave was granted from Sept. 8.

On return from sick leave on Oct. 5 he felt considerably better and had played several games of tennis. A smear of lymph-gland juice was negative for leishmania and the leucocyte count had risen to 6,000, but as the anaemia persisted two pints of packed red cells were transfused on Oct. 15. This resulted in marked improvement, for when he was discharged to light duty on Nov. 4 the red cell count was 4.8 millions, Hb 13 g., and leucocytes 4,800. By Dec. 13 glands and spleen were still palpable and an occasional evening temperature not exceeding 99° F. had been recorded, but the leucocyte count had risen to 7,800 and there was no deterioration in the red cell count and haemoglobin.

The patient was seen again on Feb. 27, 1943. He had then been doing full ground duties for seven weeks and was feeling "perfectly fit." He looked well and had gained 20 lb. in weight. The edge of the spleen could just be felt and there was one palpable epitrochlear gland. The red cell count was unchanged at 4.79 millions, but the Hb had increased to 14.5 g. and the leucocyte count was 10,800 with a normal differential picture. The erythrocyte sedimentation rate (Westergren) was 2 mm. in the first hour. No leishmania were found in smears of peripheral blood or sternal marrow, and cultures from each remain sterile.

It now seems justifiable to regard the case as cured, but the patient is being kept under periodical observation. His return to full flying duties is unfortunately precluded by a dramatic complication, quite unconnected with the leishmaniasis or its treatment, which occurred four days after his resumption of ground duty on Nov. 4. On the afternoon of Nov. 8 he was readmitted to hospital unconscious and with a number of abrasions on the face and head. A history was given of his having suddenly fallen down while walking about the station. Further inquiries suggested epilepsy, and when consciousness was completely regained 48 hours later it was found that there was a short retrograde amnesia, and a history (previously unrevealed) of three similar episodes dating from the age of 14 was obtained. An electro-encephalogram two weeks later was grossly abnormal, and was stated to be typical of epilepsy.

## Summary

A case of visceral leishmaniasis (kala-azar) in an adult contracted in Malta is described.

We can trace only four recorded cases in adults whose infection cannot have occurred elsewhere than in Malta.

The syndrome of low-grade fever, cough, adenitis, splenomegaly, and leucopenia was well marked. Nevertheless the disease remained unrecognized and apparently unsuspected for many months both in Malta and after the patient's return to this country.

We express our thanks to Group Capt. W. E. Barnes, commanding the Royal Air Force hospital to which the patient was admitted, for his permission to publish the case; to the staff of the Wellcome Bureau of Scientific Research for their interest and advice; and to Messrs. Burroughs Wellcome for the supply of drugs.

## REFERENCES

- Bassett-Smith, F. W. (1913). *J. R.A.M.C.* 21, 551.  
 — (1914). *British Medical Journal*, 2, 1058.  
 — (1923). *J. roy. nar. med. Serv.*, 9, 201.  
 Gibson, P. L., and O'Flynn, J. A. (1934). *ibid.*, 20, 154.  
 Kerr, H. I. W. (1918). *Lancet*, 2, 45.  
 Neumann, C. Zahra (1930). *J. trop. Med. Hyg.*, 33, 318.  
 Walker, J. H. C., and Gibson, C. C. G. (1933). *J. R.A.M.C.*, 60, 449.  
 Ward, G. R. (1916). *Lancet*, 2, 16.

Barth (Z. *Immunforsch.*, 1942, 101, 397) believes that through his culture method (agar with the blood of typhus cases) *Bac. proteus* X19 acquires special properties. Positive Weil-Felix reaction was obtained with the serum of guinea-pigs inoculated with such a strain, and even with the serum of guinea-pigs inoculated with genuine typhus virus. A positive Weil-Felix reaction occurs not only in the apparent animal disease but also in animals which develop a symptomless or abortive disease. On the basis of the animal experiments, the author believes it will be possible to carry out mass immunizations with this strain against typhus in man.

## Medical Memoranda

### An Improved Pappenheim Stain for Gonococci

Since the publication in the *B.M.J.* (1943, 1, 254) of a short article by me, "An Improved Pappenheim Stain for the Detection of Gonococci in Smears of Pus," I have had much correspondence concerning it. Many bacteriologists have obtained good results; others have experienced difficulties. These additional notes may therefore be helpful.

In most instances of difficulty the pyronine in the stain has been thought at fault, but I suggest that it is the methyl green. G. T. Gurr informs me that this dye is more concentrated now than before the war, and it is to be noted that the amount of methyl violet present as an impurity is variable. Gurr originally supplied green and blue-grey batches of methyl green. The blue-grey dye is now obsolete, and some batches apparently contained an excess of methyl violet. It should be observed that the green powder itself turns blue-grey in time on keeping and exposure. Some workers have got good results only by treating the methyl green twice or even three times, with chloroform, and this may be accounted for by the presence of an excess of methyl violet in the dye. I have not found more than one extraction necessary, but sometimes have produced a satisfactory stain only by reducing the concentration of the methyl green, and 0.1% may give a good result where 1.0% fails.

Pyronine from different sources has been found suitable, but some batches seem to have a lower dye content than others, as suggested by the differences in intensity of saturated solutions. Grübler's pyronine and pyronine (Conn), which is supplied by the National Aniline and Chemical Co., Inc., New York, yield excellent results.

If a satisfactory stain is not got by a reduction of the concentration of methyl green, proceed further by raising that of the pyronine. In some combinations of methyl green and pyronine, 2 g. or more of the latter may be necessary. A satisfactory stain is obtained when pyronine is present in an amount sufficient to colour the cytoplasm of mononuclear leucocytes in smears a faint pink.

In regard to the keeping quality of the modified Pappenheim stain, it is now possible to confirm that this is indefinite. I still have some prepared in April, 1943, which provides the results described in the original article.

The modified formula that follows is now recommended:

Methyl green (Gurr), chloroform-treated, 0.1-0.5%	100 c.cm.
Methyl alcohol, absolute	10 c.cm.
Pyronine G. (Conn, Grübler, B.D.H., or Gurr)	0.5 g. or more
Phenol	1.0 g.
Glycerol	20 c.cm.

**ADDENDUM.**—A bacteriologist in the Royal Navy has written me his appreciation of the stain, and has remarked that he stains directly with it and not as a counterstain in Gram's method. He claims a big saving in time and material by comparison with other stains for gonococci in smears, and has particularly noted that consistently good results are got even by laboratory assistants without any special staining experience. (I account for these results by stating that it is almost impossible to overstain.)

MAXWELL M. BARRITT, M.Sc., D.Bact., L.M.S.S.A.

City Laboratories, Liverpool.

### Long Survival after Hysterectomy for Chorion Epithelioma

The following case is described at the suggestion of Emeritus Professor Ranken Lyle, to whom I am indebted for the details of the previous treatment.

The patient, Mrs. A., aged 35, was admitted to the Royal Victoria Infirmary, Newcastle-upon-Tyne, under the care of Dr. Ranken Lyle on Aug. 27, 1910, suffering from hydatidiform mole. Curettage was performed by Dr. Lyle, and she was discharged six days later. Four months afterwards, on Jan. 6, 1911, she was readmitted, and stated that ever since the previous operation she had had a continuous small loss of blood from the vagina. The uterus was not grossly enlarged, and a diagnosis of retained products was made. On Jan. 9 she was again curetted by Dr. Lyle, who removed a few cysts from the uterus. During this operation the uterus was perforated, even though the greatest care was taken. Dr. Lyle considered this highly significant of the presence of chorion epithelioma, and performed an immediate vaginal hysterectomy. The left ovary, which was the size of a pigeon's egg, was removed, but the right, which was normal, was conserved. During the operation a further perforation occurred and a small piece of growth escaped. The uterus, which was slightly enlarged, showed a perforation through the fundus on removal. The patient was discharged from hospital

17 days later. The specimen was reported on by Dr. Stuart McDonald, who stated that the wall of the uterus was extensive, invaded by proliferating syncytial cells, and that numerous chorionic villi showing myxomatous degeneration were present. The condition was one of chorion epithelioma.

On Dec. 13, 1943, this patient, now aged 68, attended the outpatient department, bringing with her a letter she had received in 1924, asking her to attend the follow-up department. She explained that she had not been able to attend then owing to a domestic crisis, and apologized for keeping the department waiting 23 years. On examination I could detect no pelvic abnormality. There was no prolapse, and the vaginal vault was smooth and mobile. There were, however, signs of basal cystitis, for which she is now receiving treatment. She is very active, and still does all her own housework.

It would appear that freedom from recurrence for 33 years is sufficient to claim a complete cure.

Newcastle-upon-Tyne.

STANLEY WAY, M.R.C.O.G.

### An Unusual Swelling on Dorsum of Foot

This case is of interest, first because of the unusual finding at operation, and secondly because it illustrates the difficulty of making diagnoses in China, the land of surprises. The patient was a comparatively well-nourished Chinese soldier aged 48. He came complaining of a painful swelling on the dorsum of his left foot.

#### CASE HISTORY

The patient had had nothing the matter with his feet until three months before admission. Then, while marching, he experienced a sudden pain in the under-side of his left foot. At the time he was wearing straw sandals, which protected him from sharp flints, etc. When he examined his foot he found no injury, though the pain persisted; the site of this pain was just lateral to the ball of the foot. About a month later he noticed a swelling on the dorsum of the foot; the pain was now referred to this lump, which slowly increased in size.

Examination showed the patient to be well developed. His feet were typical of the ordinary Chinese buck private; the soles were well protected by a horny layer of thick skin, in which were the usual fissures. On the left dorsum an oval-shaped swelling about 1 in. by 2 in., lying in the long axis of the foot, could clearly be seen; it seemed to arise in the space between the extensor tendons of the big and first toes. On palpation it felt rather like a ganglion, as it was fluctuant; but somehow it gave one the feeling of more of soft rubber than of fluid; it was too tense to be a lipoma. Medical opinions were divided between a ganglion and some kind of tumour with cystic degeneration.

**Operation.**—Under spinal anaesthesia a longitudinal incision was made over the swelling. The tumour was adherent to the tendon sheath of extensor hallucis longus, while the tendon of extensor hallucis brevis appeared to go right through it. At this stage the macroscopic appearance resembled a sarcoma of the extensor sheath. Therefore the part of the tendon buried in the tumour was excised and an attempt was made to dissect out the base of the tumour and remove it *in toto*. Owing to its adherence to all near-by structures and the lack of any plane of cleavage, the dissection proved difficult. The cyst was punctured and a small amount of thin pus ran out. Finally, as this was almost completed, the whole cause of the trouble became apparent. A large thorn about 1½ in. long protruded from between the metacarpals into this mass of tumour. The thorn was quickly removed, and the area where it lay was curetted. After suturing the stump of the extensor hallucis brevis tendon to that of the longus, the skin was closed round a small rubber drain, which was removed next day. The wound healed by first intention.

The swelling was the result of a reactionary inflammatory process caused by a foreign body—namely, a thorn—which had pierced the sole of the foot three months previously. The thorn had passed upwards between the metatarsals of the big and first toes, and had become encapsulated in the space between the extensor tendons of those toes. The capsule was thick and adherent to the skin, to the sheaths of the extensor tendons, and to the interossei muscles. Inside the capsule was buff-coloured gelatinous degenerating matter. In the centre was a small space occupied by the thorn and a small quantity of grey pus. Owing to the lack of pathological facilities no further examination could be made.

I would like to thank Dr. Robert McClure of the Friends' Ambulance Unit, China Convoy, for his help in preparing this account.

JOHN F. THOMPSON, M.R.C.S.

Medical Officer, British Red Cross China Unit

F. L. Munro and H. W. Jones (*Amer. J. med. Sci.*, 1943, 26, 710), who record three cases in aviation cadets aged from 23 to 26, state that agranulocytosis due to sulphadiazine administration during acute infections may be benefited by subsequent dosage with the same drug. Spontaneous regeneration of polymorphonuclear leucocytes by the depressed bone marrow may occur during the administration of large amounts of sulphadiazine, even though this drug was responsible initially for the depression.

## Reviews

### BLOOD GROUPS AND TRANSFUSION

*Blood Groups and Transfusion.* By A. S. Wiener, M.D., serologist and bacteriologist in the office of the Chief Medical Examiner of New York City; head of Transfusion Division, Jewish Hospital of Brooklyn. Third edition. (Pp 438; illustrated 41s.) London: Baillière, Tindall and Cox 1943.

Since it first appeared in 1935 *Blood Groups and Blood Transfusion*, by Alexander S. Wiener, has been the standard work for all interested in the blood groups. There was a second edition in 1939. The outbreak of war and the widespread adoption of "blood banks" in civilian hospitals have led to a greatly increased interest in the subject and stimulated the author to produce a third edition, which has been largely rewritten. The new volume is intended to summarize present knowledge concerning the theory and technique of blood grouping, to present the applications in clinical, legal, and veterinary medicine and in anthropology, and to assemble and integrate the essential facts concerning the transfusion of whole blood, plasma, and serum.

There are two new chapters, one dealing with the transfusion of stored blood and blood derivatives and the other with the recently discovered Rh factor and its role in erythroblastosis foetalis. In discussing the preparation and use of stored blood and derivatives surprisingly little reference has been made to the experience gained in Europe. There is no reference to the work of Greaves and his colleagues at the Serum Drying Unit, Cambridge. Since 1941, in practice concentrated serum or plasma has been given by the usual methods and not by a syringe as recommended by Wiener. It would be extremely difficult to give an adequate dose to a restless shocked casualty with a syringe technique. The chapter dealing with the Rh factor is also disappointing. Our knowledge of this complex and intriguing factor is largely dependent upon the work of Wiener and his colleagues who first discovered it, and one had hoped for a rather more extensive summary of the present position, which is admittedly a constantly changing one. Experience with large-scale blood grouping in this country has demonstrated the wisdom of using as anti-A serum only serum which is known will react with known A,B cells. Wiener mentions the danger of mistaking AB blood of A,B subgroup for group B, but does not suggest the remedy that has proved so satisfactory over here. These criticisms, however, sink into insignificance before the debt all interested in the blood groups owe to Alexander Wiener.

### CHILD PSYCHOLOGY

*The Life of Childhood.* A Contribution to Analytical Psychology. By Michael Fordham, M.D. (Pp. 154; illustrated. 15s.) London: Kegan Paul, Trench, Trubner and Co. 1944.

Dr. Fordham is one of the small group of medical psychologists practising in this country who still follow the theories of Jung. He has devoted himself to the treatment of children, and in this book he gives to the world the results of his experience and demonstrates the application of the Jungian philosophy to that experience. His general findings and methods are very similar to those of other workers in child psychiatry, but, as he says, the interpretation of this material in terms of the various schools is rather like the translation of a classical passage into several different languages. Although the basis is common to all, the resultant translations may be very different. The danger is, of course, that the translation may become more concerned with the language into which the material is translated than with the material itself, and the less learned and instructed reader may wonder why it is necessary for the original passage, which he can understand well enough, to be translated at all.

The motif of the Jungian translation is the influence of the unconscious, especially that common universal part containing the archetypes of thought and feeling which influence the behaviour and reaction of both parents and child. The author points out that the child is and should be less conscious than the adult, and that treatment will therefore concern itself almost exclusively with the means whereby the child exteriorizes the unconscious—namely, in play, the drawing of pictures, in

fantasy and dream. The therapist must meet and co-operate with the child in this milieu.

Since so much of the child's behaviour is unconscious, his conduct, whether normal or abnormal, cannot be judged by adult standards. Adults will not be successful in their handling of the child, whether in the nursery or the school, if they are bound by rigid consciously determined rules and formulae. To be successful adult and child must meet on a common ground, and the child must be given an opportunity, generally through play, to work out his inner needs, which he himself does not fully understand. How far, therefore, the child's play should be interpreted to him in conscious formulae, in accordance with this or that school of thought, may be a matter of doubt.

This is an interesting book, sufficiently illustrated by clinical material and by reproductions of children's drawings. It is, moreover, much more readable and comprehensible than most books of the Jungian school, and is to be recommended to all who are interested in child psychiatry. To the ordinary parent the terminology and theory of analytical psychology will probably prove difficult and even misleading.

### RACE AND CRIME

*Race and Crime.* By Willem Adrian Bongers. Translated from the Dutch by Margaret Mathews Hordyk. (Pp. 130, 51.50 or 10s.) New York: Columbia University Press, London: Oxford University Press 1943

So many irrational and pernicious doctrines of race have been propagated during the last ten years that a scientific pronouncement on the connexion between race and crime is highly necessary. Prof. Bongers, who died of his own free will a few days after the German torrent had burst into his native country, had been the first leader of criminological thought in the Netherlands and had held the chair of sociology and criminology at the University of Amsterdam until his death. He was a specialist in the sound analysis of statistics, and the leading exponent of the philosophy of crime as a social and not a biological phenomenon. This is a translation of his last book, *Ras en Misdaad* which was published at Haarlem in 1939. He concludes that no definite results have been obtained in the study of the relationship between race and crime. The anthropology of races is still only in its inception, and the study of the anatomy of the brain cannot yet explain the differences among races which might exist in this regard; nor has scientific psychology gone much further in its study of races; and criminology is also badly informed, for criminal statistics do not as a rule give details of race. Criminality, moreover, he says, is not a characteristic like a round skull or blue eyes. Crime is always limited to a small number of individuals in a race. Often the criminological facts do not accord with what is psychologically known: the Nordic race is violent, but its aggressive criminality in the ordinary sense is small. The Jewish race is unusually subject to neurosis, but Jews commit few crimes of violence. Prof. Bongers emphatically denies any special predisposition for crime, and points out that predisposition is not predestination. His conclusions, based on a large number of case studies, are quite negative, but none the less possess high evidential value. His bibliography, amplified by the translator, is very full.

### Notes on Books

In *Man Studies Life: The Story of Biology* (Watts and Co.; 2s. 6d.) Mr. G. N. RIDLEY has attempted, with some success, to compress a large subject within the limit of a hundred small pages. After a short explanation of the science of biology he traces man's study of living organisms from the time of Hippocrates to the present day, devoting the greater part of the book to the advances of the last two centuries. The names and achievements of nearly 160 scientists are mentioned, so that some demand is made upon the absorptive powers of the reader. This book, which includes a glossary and a short well-chosen bibliography, provides a useful introduction to the study of biology.

The *Dentists Register* for 1944 has now been published for the Dental Board by Constable and Co., price 15s. The total number of names appearing on January 1 of this year is 15,404, being 212 more than the figure for 1943. All the new entries added were of persons registered as graduates or licentiates. During the past 20 years the total number on the *Dentists Register* has risen by fewer than 2,000 names.



## Preparations and Appliances

### A HAND RETRACTION PIECE

Major B. K. RANK, A.A.M.C., writes:

If the apparatus to be described would seem too simple or obvious, description is warranted by its value in operations on the palmar aspect of the hand where any elaborate dissection is indicated, more especially where excision and free grafting procedures are to be done, and also in many cases requiring extensive fasciectomy, tenolysis, tendon repairs, or grafts. The apparatus functions for maintaining hand retraction in a fixed posture, and it acts as a counter-pressure agent where pressure dressings are indicated.

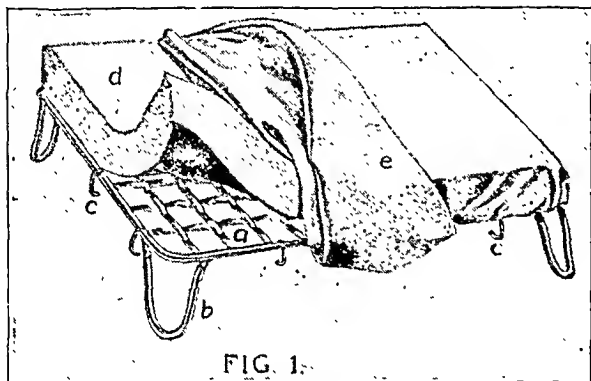


FIG. 1.

*Description of Apparatus* (see Fig. 1): A wire grill (a) approximately 6 in. x 9 in. (e.g., that used as a toaster for a gas-stove) is fitted with corner legs (b) about 2 in. high. Distributed at intervals about its rim are several attachments (c) to act as hooks for rubber bands. A pack of sorbo rubber (d) about 1 in. thick is sewn to the upper surface of the grill. This is covered with a jaconet wrap (e) maintained by tapes to prevent undue soiling of the rubber with blood, etc. Several ordinary wide rubber bands complete the requirements. (Fragments of old rubber gloves can be used.)

*At Operation* (see Fig. 2) the hand is maintained in suitable posture for dissection by arrangement of the rubber bands

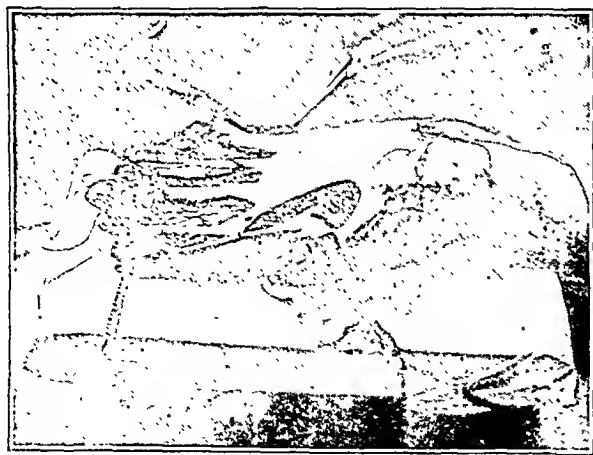


FIG. 2

between the hooks and the fingers; separate bands for the thumb, sometimes for the little finger or for any finger with fixed flexion deformity. This maintains traction on any scar and facilitates incisions and dissections. As scar is removed extension of the finger proceeds by the elastic traction. When the disability is corrected to the indications of the case the corrected posture is maintained by the traction, while patterns can be cut and a graft sutured in with the required finesse

without change of posture. Moreover, again without change of posture, the pressure dressing on a graft can be applied by including the whole apparatus in the pressure bandage (see Fig. 3). The size and arrangement of the stand permit of a pressure bandage in any or all directions across the palmar aspect of the hand and fingers so that pressure is evenly distributed by impression of the whole of the dorsum of the hand into the rubber pad. Finger abduction is arranged as desired by wool packed between the fingers. When the dressing is complete the rubber bands maintaining the finger posture can be slipped off or cut; though it is often convenient to leave them attached to the apparatus for replacement at subsequent dressings.

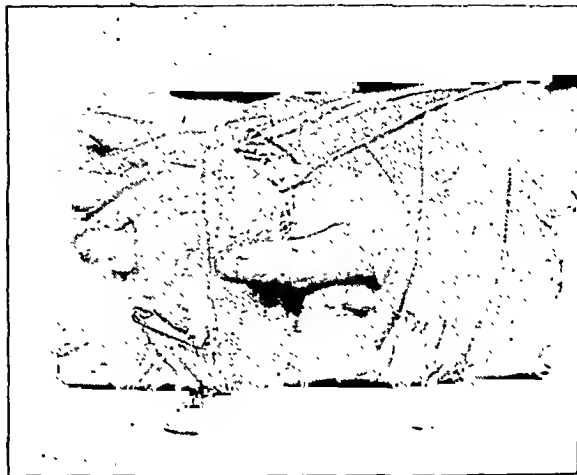


FIG. 3

*Advantages of the Apparatus.*—(1) Elaborate dissection can be carried out with finger traction maintained and without the cumbersome embarrassment of assistant hands or retractors. (2) An exact and constant posture of the hand can be maintained for long periods during grafting and dressing procedures. (3) Continued or intermittent traction can be arranged for tendon or joint contractions. (4) Pressure dressings are facilitated without undue pressure bearing on vulnerable points, such as the outer sides of the 2nd or 5th metacarpal heads, and without producing cupping of the palm, movement and partial loss of the graft about the inner side of the thenar or hypothenar region. These deficiencies are often seen with round-and-round crêpe bandages. (5) In post-operative treatment traction can be reapplied and posture need not be disturbed at subsequent dressings. (6) The apparatus is not an expendable entity.

### PROTEOLYSED LIVER

There are undoubtedly certain occasions on which it may be convenient to give liver extracts by mouth. Pernicious anaemia of pregnancy and pernicious anaemia with sensitivity to injected liver are examples. Owing to wartime shortages of alcohol and glycerin as well as of liver, oral extracts of liver have been officially banned, but the new process of preparation by means of papain digestion has allowed this ban to be relaxed. "Hepamino" (Evans) is the pioneer preparation of this type, and we can only regret that it has been given such a name. The proper title is proteolysed liver (extractum hepatis proteolysatum), which sufficiently distinguishes it from the dry and the liquid extracts of liver in the *British Pharmacopoeia*.

### SUPPLY OF THIOURACIL

Organon Laboratories, Ltd. (Brettenham House, Lancaster Place, W.C.2) announce that they have prepared thiouracil and several of its derivatives in tablets for oral use, and would welcome inquiries from medical men who would like to try these substances under suitably controlled conditions.

Genatosan Ltd. (Loughborough, Leicestershire) announce that they have now prepared thiouracil and that it is available in tablets containing  $1\frac{1}{2}$  grains for oral use in the treatment of thyrotoxicosis. They also supply thiourea in tablets of 5 grains for the same purpose.

## BRITISH MEDICAL JOURNAL

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## CROSS-INFECTION IN HOSPITALS

The treatment of illness in hospital rather than in the home has many advantages. It also has one serious drawback. This is the risk—sometimes slight, but in some classes of patient genuine and ever-present—of acquiring a fresh infection. To suppose that the great reforms of the latter part of the nineteenth century did away with this risk or even reduced it to minor proportions is a grave mistake. Indeed, next to chemotherapy, perhaps the most important line of medical advance during the past ten years has been the study of cross-infection; and the revelations made have been startling. Systematic bacteriological study, and more exact methods of identifying bacteria, notably the typing of streptococci which we owe to Griffith, have furnished proof that patients in open wards exchange bacteria freely. What was formerly regarded as a series of unfortunate and unconnected accidents is now recognized as a ward epidemic of haemolytic streptococcal infection, taking a variety of forms and possibly continuing with intermissions for months. Though this particular infection has aroused most interest because its migrations were formerly so obscure, it is only one of many which may be spread in a hospital ward. These include diphtheria and other infectious fevers, other infections of the air passages, dysentery, infantile diarrhoea, and other gastro-intestinal infections, various skin diseases, a troublesome example of which is pemphigus in newborn infants, conjunctivitis, and vulvo-vaginitis. The danger is greatest among children, particularly infants, and the ravages of enteritis have often been such that some authorities have questioned the wisdom of treating infants under ordinary hospital conditions at all.

The Committee on Preventive Medicine of the Medical Research Council appointed in 1939 a subcommittee on cross-infection in hospital wards, whose report has now been published.<sup>1</sup> A foreword by Sir Wilson Jameson explains that it was at first the purpose of this subcommittee to recommend structural changes in hospitals, but since these are now impracticable the purpose of this memorandum is to secure the desired results so far as may be possible without such changes. The first section—on the prevalence and consequences of cross-infection—is a concise and documented statement of what is now known about the acquisition in hospitals of infections of the respiratory and gastro-intestinal tracts, wounds, and skin and mucous membranes, and forms a serious indictment of present conditions. The second—on sources and modes of infection—illustrated by some telling original

diagrams, describes three main routes: droplets and drop-let nuclei, dust, and contact, the last being either direct or mediate via clothes, ward articles, food, or insects. These sections occupy six pages. The remaining twenty-two are devoted to practical instructions of every kind for the prevention and control of cross-infection. These range over many aspects of hospital work and are divided into those of general application and those called for in connexion with particular diseases. They include precise instructions for the use of disinfectants for many different purposes—the total of these specified, using either chemical disinfectants or heat, is 29—a full set of rules for barrier nursing, a set of special rules for maternity units, rules for a ward dressing team (based on those given in M.R.C. War Memorandum No. 6), and instructions for treating floors with spindle oil. Among "general administrative procedures" several recommendations are of interest. Hospital structure is the first concern, and here it is stated unequivocally that "the large open undivided ward must be considered as obsolete"; "nearly half the number of beds in a children's or infectious diseases hospital should be in individual cells and the remainder in small units." E.N.T. wards might have been mentioned as requiring the same subdivision. Swabs should be taken on admission from the nose and throat, and from the rectum in children with diarrhoea. Children likely to remain in hospital for some weeks should, if this has not been done, be immunized against diphtheria and possibly against whooping-cough. Visitors to children's wards should be discouraged, parents being afforded ready telephonic response to inquiries instead. That all visitors should wear masks, and, if supplies permit, gowns as well, is perhaps going rather far, but no doubt the public would get accustomed to it in time. Other sensible recommendations are that all kitchen staff should be instructed to report even minor gastro-intestinal disturbances, and that there should be a conspicuous notice in all water-closets: "Next wash your hands!"

The nurse is the person most closely concerned in these matters. A strong point is made of the need for giving the skilled nurse full opportunities for her proper work. This means relieving her of the domestic type of duty, both by labour-saving devices—several useful ones being specifically mentioned—and by allocating some of these duties to ward-maids. A nurse engaged in making up babies' feeds should not be required to change napkins, or otherwise deal with excreta or with septic conditions. Nurses should also receive both theoretical and practical instruction in bacteriology, a set of thirteen exercises for which is detailed in an appendix. This is perhaps the most difficult of all the recommendations to carry out—in large teaching hospitals because classes are themselves large, and in smaller because no teacher may be available. Where it has been done it has nevertheless been found well worth while.

This memorandum, if its value is realized, should have the largest circulation of any of the excellent war publications of the M.R.C. To ensure the application of its precepts a copy ought to be in the hands of every sister of every ward of almost every hospital in the country.

<sup>1</sup> M.R.C. War Memo. No. 11, *The Control of Cross-infection in Hospitals*. H.M.S.O., 1944. (6d.)

## DOCTOR AND CORONER

The coroner's office is very ancient, and more important than appears at first sight. His chief duty is to inquire into the cause of a death which may not have been from natural causes or has been attended by suspicious circumstances. His inquest is ordinarily public, and its result is published. He even holds an inquest on the body of a person on whom judicial sentence of death has been executed. He is therefore a powerful bulwark of liberty, for he opposes a constant obstacle to all those, both low and high, who would use murder to forward private ends or public policies. The medical practitioner, through his close professional contact with death, is in a position to give the coroner frequent and valuable help; and this help in the vast majority of cases he gladly gives. Now and again, however, friction arises between these two good public servants. The cause is usually an admirable but, as some think, a misplaced zeal on the coroner's part to inform himself more fully of deaths in hospital. This controversy is old, and is well annotated in "Taylor" and other textbooks of medical jurisprudence. Recently a coroner found it advisable, to enable him (as he judged) better to fulfil his duties, to request the medical staffs of hospitals in his district to report to him all deaths occurring in certain specified circumstances. These included deaths either within 24 hours of an anaesthetic or operation, or before consciousness was fully regained, and deaths within 24 hours of admission to hospital. Some medical officers took strong exception to the request, and consulted their defence societies. Accordingly the Medical Defence Union and the London and Counties Medical Protection Society, desiring to know the exact legal position, framed a set of questions for counsel's opinion. Mr. Roland Burrows, K.C., LL.D., who has had long experience of medical jurisprudence and is president of the Medico-Legal Society, composed an opinion which, in the absence of any judicial authority on these questions, commands the highest respect.

A number of the questions dealt with the hypothetical legal duty of the doctor to report deaths to the coroner. Mr. Burrows answered all these questions with the surprising but convincingly argued opinion that no citizen has any duty to report to the coroner any death at all. Surprisingly, belief that some such duty existed at common law was almost if not quite unanimous. *Servis on Coroners*, the best-known textbook, lays down that in all cases of sudden death, or death in suspicious circumstances, where the duty of informing the coroner is not by statute imposed upon any particular person, it is the duty of those about the deceased to give immediate notice to the coroner or his officer, or to the nearest officer of police, who then communicates with the coroner. A Home Office circular issued in 1927, doubtless with the approval of the legal advisers to the Secretary of State, said that if the medical practitioner has any reason to believe that an inquest may be necessary it is "of course" his common-law duty as one of those about the deceased to notify the coroner, his officer, or the police, but he must still certify the cause of death. Mr. Burrows, however, points out that the test of

an alleged legal duty is whether it can be enforced. When ever proceedings have been taken, the offence charged has been that of "obstructing a coroner in his duty." To prove this the prosecution must show that the coroner owed a duty to hold an inquest, and that the accused did something with the intention of preventing the inquest from being held. There is no trace of an individual responsibility based merely on a failure to give information. The doctor is for this purpose an ordinary citizen, as (except in a few special cases, such as death in a mental hospital or a retreat for habitual drunkards) he owes no statutory duty to report a death to the coroner. By the Births and Deaths Registration Act, 1926, Sect. 6, the medical practitioner who has attended the deceased in his last illness and can form an opinion on the cause of death must send the certificate to the registrar, and the registrar must report to the coroner any death covered by the long and detailed list contained in the Registration Regulations (S.R.O. 1927, No. 485), which includes the absence of a certificate. Mr. Burrows therefore thinks that the law relies upon the rules governing registration and burial to ensure that the coroner shall receive information, and leaves to the individual conscience of the citizen the decision whether he shall volunteer information.

In asking Mr. Roland Burrows whether a practitioner was entitled to perform a post-mortem examination in given circumstances without the consent of the coroner, the defence societies were evidently misunderstanding the position. Mr. Burrows replied that the coroner's consent is never necessary, but that he may direct or request a necropsy under the Coroners (Amendment) Act, 1926. For the rest he gave the interesting opinion that the only examination that can lawfully be made, is one under Sect. 7 or 8 of the Anatomy Act, 1932, the legality of which does not depend on whether the cause of death is known or in doubt. This, he explained, is not a full post-mortem examination but an "anatomical" examination, which he takes to mean a full visual examination of all parts of the body. Doubtless many medical practitioners would have liked him to enlarge a little on this question, for his words appear to imply that the universal practice in hospitals of holding post-mortem examinations for scientific purposes is illegal. The summary which he authorized and which appeared in the *Journal* for Nov. 27, 1943 (p. 694), makes the matter easier: a practitioner may, he says, make a post-mortem examination with the consent of the deceased's relatives, whether or not he knows the cause of death, unless by so doing he knowingly hinders the coroner in carrying out his duties. As soon, however, as it comes to his knowledge that the coroner has been informed from any source touching the death he should on no account make any examination without instruction from the coroner. The coroner's consent, in other words, may technically not be necessary, but it is sometimes just as well to get his *nihil obstat*.

At law, then, if Mr. Burrows is right (and in the absence of authority it is really an open question), the doctor need not report any death to the coroner, but should merely certify according to the Registration Acts and send the certificate to the registrar. Socially and morally, however,

he may often owe a duty to inform the coroner direct. Both the defence societies and Mr. Burrows emphasize this far more important aspect of the matter. Doctor and coroner are alike servants of the public, and their service will be better if they co-operate. The registrar is not a swift channel of information, nor is he medically qualified. To leave him to sift the matter means further delay and distress to relatives who probably have enough to bear already. The custom whereby the doctor informs the coroner direct of facts which should put him on inquiry is a good one, and Mr. Burrows's opinion does not suggest that it should be modified by a hair's breadth. Harmony between the two will best be maintained if the doctor gives the coroner all the information he feels he can properly give, and the coroner respects the doctor's reasons for wishing to set limits to this concession.

### PENICILLIN IN WAR WOUNDS

One reason given for the present non-availability of penicillin to civilians is the prior claim of battle casualties. That penicillin well used at a reasonably early stage can largely overcome sepsis in battle wounds is evident from the report of Florey and Cairns on their experience in Tunisia last summer, which was reviewed in this *Journal* a few months ago.<sup>1</sup> It is evidently intended that as many casualties as possible in forthcoming operations shall have the benefit of this discovery, since the Medical Research Council has now published a memorandum of practical instructions solely for treating battle wounds of various kinds with penicillin.<sup>2</sup> This has been drawn up by the Penicillin Clinical Trials Committee, who acknowledge their indebtedness to Florey and Cairns for much of the essential information on the technique of actual treatment, and indeed quote freely from the War Office report to which we have already referred. This is the first manual of instructions for penicillin treatment to become generally available, and may be found useful to those so fortunate as to have penicillin at their disposal for other purposes, since some of the information given is necessary for any form of treatment. The memorandum consists of three parts. The first describes the preparation of penicillin for use: the solid as supplied may be either diluted with sulphanilamide as a powder, dissolved in sterile water to furnish solutions of various strengths, or incorporated in a cream. It is emphasized that penicillin is unstable, and various precautions are needed both to ensure that activity shall not be lost and to prevent contamination. The instructions for actual use reproduce in the main the recommendations of Florey and Cairns for the treatment of soft-tissue wounds and compound fractures—namely, suture and local treatment for the former, and suture when possible and a short course of systemic treatment for the latter. Special types of wound and of wound infection, and burns, are dealt with more briefly. A final section deals fully with the laboratory control of treatment. This involves determining the susceptibility of the bacteria concerned to penicillin, estimating the penicillin content of wound fluid after local treatment, estimating the penicillin content of blood, and titrating the potency of penicillin itself should this be suspect. Several methods for some of these proceedings are given. There is a useful list of classified references to the principal papers on the subject, with their titles.

<sup>1</sup> *British Medical Journal*, 1943, 2, 755.

<sup>2</sup> M.R.C. War Memo. No. 12, *The Use of Penicillin in Treating War Wounds*, H.M.S.O., 1944. (3d.)

### CLASSIFICATION OF DISEASES AND INJURIES

The truism that the more accurate the data submitted to analysis the greater the probability that a skilful analyst will reach accurate conclusions applies with peculiar force to the work of a medical statistician, because his data consist of other men's opinions on the correctness of which he may doubt but must, in his arithmetical operations, assume. It is true, of course, that statisticians of genius, the Graunts and Fatts, have often profitably used data which duller men supposed not to be worth the trouble of analysing, and also true, as Farr said, that an elaborate nomenclature is not enough to guarantee exact statistical data. But in this and other civilized countries a large proportion of the graver forms of sickness and injury come under observation in hospitals and institutions, in which the combined skills of experts in different branches of medical knowledge enable a precise statement of the facts to be made. The object of the volume published by the Medical Research Council<sup>1</sup> is to make data obtained in this way available for the advancement of medical science by statistical analysis. A work of this kind cannot make a wide appeal; a reader who opens it at random and discovers that a "soldier, with an infected ununited compound fracture of the humerus (the infection being staphylococcal) consequent on an accident while playing football on leave, is coded I=84(3V)2VX-4X: II=686-2, or, on machine

XX

VV

cards, I=8 4 3 2 4: II=686-2," may not be deeply interested. He should, however, reflect that the compilation of a dictionary is of great value to those who have to translate from one language into another, although the result is of little interest to others. The analogy is incomplete, because in the case before us there are not two but three operations: translation from a language we know into a strange language; grouping of the translated words; presentation of the results in the known language.

Only a small number of medical readers will wish or are even competent to criticize the first operation in this series. Many medical readers are, however, competent to criticize the preliminary choice of terms to be translated. Both in the preface and in the body of the work the provisional nature of the classification is emphasized.

"The present classification must be regarded as experimental, and liable to be modified after practical trial. Expert opinions regarding heart diseases and psychoneuroses, for example, are so conflicting that only tentative groupings could be made, and the classification of heart diseases on pp. 45 and 46 below was framed deliberately so as to obtain some of the information needed before a satisfactory grouping can be evolved."

We have no doubt that the invitation given in this passage will be accepted. One caution may be offered to those who accept it. The final object of this preparation is statistical—viz., the elucidation of group phenomena. This means that a number of individual records are merged to provide some index or characteristic of the group, with the consequence that some personal differentiae are lost. All soldiers with infected ununited compound fractures of the humerus, the infection of staphylococcal origin consequent on football accidents sustained on leave will be coded as described, although no doubt an expert could classify these fractures and the circumstances under which they were sustained into many subgroups. But there is no end to this process, and eventually one may find that the number of groups is coextensive with the number of individuals—the heap of stones has been resolved into its separate stones. One is reminded of Walter Bagehot's defence of party government: that, without it, to each motion in the House of

Commons there would be 640 amendments, none of which would be carried, nor the original motion. That is a reason for thinking carefully before adding to the list of diagnoses to be translated. The introduction of machinery has enormously reduced the time and labour required for tabulation; and, we may hope, team work will enormously increase the data available for tabulation. It is not, however, unduly pessimistic to hold that, with this list as it stands and even nation-wide data, a very long time must pass before complete tabulation would be a statistically profitable enterprise.

The volume is a valuable contribution to the advancement of science; all those intimately associated with the work will approve the expression of indebtedness to Dr. Percy Stocks and Dr. Robb-Smith recorded on the back of the title-page.

### TRAUMATIC DEAFNESS

Loss of hearing due to acoustic trauma is recognized as a clinical entity. Since some persons are more liable to traumatic deafness than others, the elimination of such predisposed persons from noisy industry might be an effective prophylactic measure. Persons with a family history of hereditary deafness are likely to suffer, and so also are those with a scarred membrana tympani. Conduction deafness should be a bar to work in noisy occupations, as fixation of the stapes increases the intensity of sounds by bone conduction. It has been suggested that a test of threshold value taken before and again thirty seconds after exposure to an 80-decibel tone at the same frequency (256 dv.) for five minutes might give an indication of individual resistance to the effect of loud sounds. To put this into practice Wilson<sup>1</sup> made observations on 85 recruits at an Army training centre before and after firing. In 27 of these there was a rise in the threshold for hearing after subjection to the fatiguing tone, while in 58 there was not. Twenty-one out of the 27 showed a hearing loss on return from firing later, while 6 had the same threshold before and after firing. Ten only of the 58 who had not been affected by the fatiguing tone had a rise in threshold after firing, while 48 did not. There were thus 31 cases with a loss of hearing after firing, and on re-examination one or two weeks later 15 out of 16 re-examined still showed some loss. These results, which may be found analysed in more detail in the original paper by Wilson, give support to the argument that impaired hearing predisposes to an increased susceptibility to acoustic trauma, and it also appears that the ears of some persons are more easily fatigued and are more susceptible to acoustic trauma than those of others. It is suggested that this relation between a liability to auditory fatigue and to traumatic deafness may be employed as a test for predisposition to the latter. In this way susceptible individuals may be recognized and eliminated from occupations in which noise may have an injurious effect on the hearing.

### LUNG FLUKES

Human cases of paragonimiasis appear to be rarities in countries other than China, Formosa, Japan, and the Philippine Islands; and the recent record of an indigenous case in Nigeria<sup>2</sup> is of interest both in extending the known distribution of *Paragonimus westernmanii* and in reminding the medical profession that either or both pulmonary and cerebral symptoms may be caused by this parasite. In the Nigerian case pus from a cyst in the left sterno-mastoid contained the characteristic operculated ova, while none were seen in the sputum. Apparently the flukes had

penetrated the central nervous system eleven years previously, when a fit was followed by symptoms of cerebral lesions. The other African records are from Tripoli, the British Cameroons, the Belgian Congo, and from a much-travelled Arab. No cases have been reported from European countries, though the possibility of its becoming endemic is now present with the invasion of the rivers by the mitten crab, *Eriocheir sinensis*, the second intermediate host. As in America, another snail might deputize for *Melania* (the first intermediate host in the Far East), and a reservoir host, the musk rat, is already present. *Paragonimus* ova, expectorated in sputum or passed in the faeces, on reaching the snail hatch out and multiply internally, resulting in a large number of active cercariae. These escape into the water and bore their way into certain species of crustacea, where they encyst. It is this stage which is infective to man, when crayfish or crabs are eaten raw or undercooked, and to the reservoir hosts—both wild and domestic carnivores such as the musk rat, wild cat, beaver, mink, fox, and tiger, or the rat, cat, dog, and pig. In America, where exceedingly few human cases have been reported, *Paragonimus* has been found in the mink, cat, and dog in many areas. With a review of the world distribution of *Paragonimus*, LaRue and Ameel<sup>3</sup> report its occurrence in crayfish purchased in widely separated localities in North America. In living crayfish the encysted cercariae were recognizable to the naked eye because of their white excretory bladders, in contrast to the yellowish host tissue, and were most numerous around the dorsally situated heart. In preserved crayfish the hearts required to be cleared in phenol in order to reveal the cysts. If a crustacean is very heavily parasitized it is possible that encysted cercariae may fall off the gills and be swallowed in drinking-water. This seems the only explanation of the source of human paragonimiasis in countries where crustacea are not eaten raw or undercooked. A single case of paragonimiasis in a New Britain native was reported<sup>4</sup> before the Japanese invasion, so that it is probable that suitable intermediate hosts are present. A few cases have been reported in Sumatra, Java, Indo-China, Malaya, and India.

Haemoptysis occurs in a small proportion of cases only, and the diagnosis of paragonimiasis depends on the finding of operculated ova in sputum, faeces, or pus from cysts. Small brown oval worms are found in necropsy material and are usually most numerous in the lungs. X-ray examinations are not regarded as a satisfactory diagnosis. The most efficacious treatment so far reported<sup>5</sup> resulted in four cases showing no recurrence of symptoms and two cases relapsing five months after intramuscular injections of prontosil (2.5% to a total of 60 to 165 c.cm.) with intravenous emetine hydrochloride (4% to a total of 12 to 23.5 c.cm.) over a period of 7 to 17 days.

Mr. Somerville Hastings, consulting surgeon to the Ear and Throat Department of the Middlesex Hospital, has been elected Chairman of the London County Council. Mr. Hastings has been Chairman of the Hospitals and Medical Services Committee of the L.C.C. for the past ten years.

Dr. T. L. Hardy will deliver the Croonian Lectures before the Royal College of Physicians of London on Tuesday, May 9, and Thursday, May 11, at 4 p.m., at the College, Pall Mall East. Subject: "Order and Disorder in the Large Intestine."

<sup>1</sup> LaRue, G. R., and Ameel, D. J., *J. Parasitol.*, 1937, 23, 382.

<sup>2</sup> Cienito, R. W., and Backhouse, T. C., *Med. J. Austral.*, 1927, 14, 77.

<sup>3</sup> Arch. Otolaryngol., 1943, 37, 757.  
<sup>4</sup> Yarwood, G. R., and Elmes, B. G. T., *Trans. roy. Soc. trop. Med. Hyg.*, 1943, 36, 347.

<sup>5</sup> Yokogawa, S., Wakisaka, K., and So, K., *J. med. Ass. Formosa*, 1940, 39, 164.



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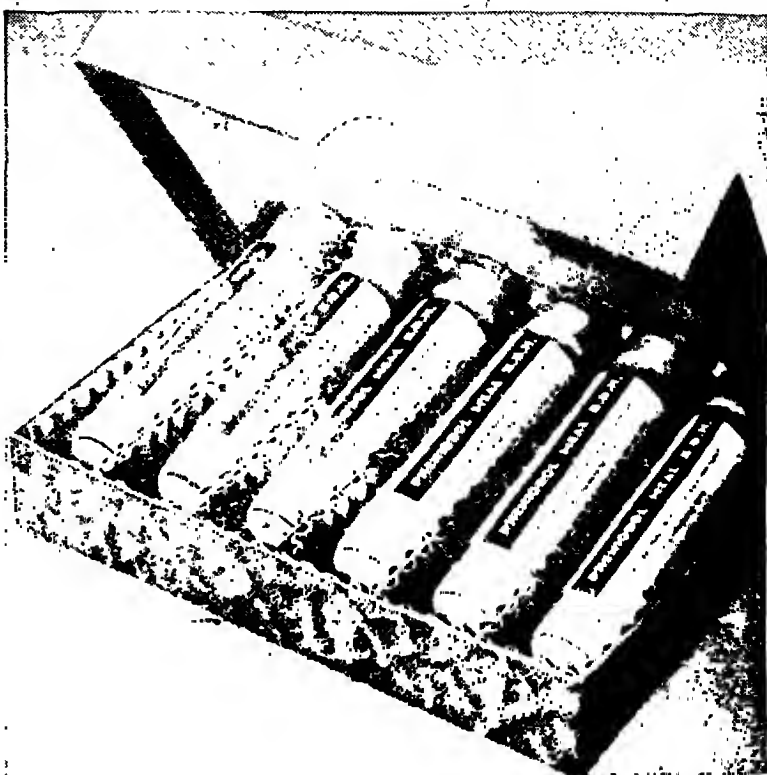
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## MANAGEMENT OF A FIELD SURGICAL UNIT

BY

J. HOWELL, M.B., B.Ch.

*Major, R.A.M.C.; Specialist in Anaesthetics*

AND

B. McN. TRUSCOTT, M.B., B.S., F.R.C.S.

*Major, R.A.M.C.(T.); Surgical Specialist*

Much attention has been paid at discussions and in the journals to the purely operative side of forward surgery, but in our opinion the other side, which may be termed loosely the "running of the unit," has been somewhat neglected. When taking a new Field Surgical Unit into the forward areas there are many pitfalls into which the unwary may stumble but which with forewarning can be easily avoided.

The unit to which we belong has been working for a year and has functioned through two campaigns involving three different types of military operations. It is based on the Middle East establishment and carries, in addition to the surgeon and anaesthetist, a corporal operating-room assistant, a lance-corporal clerk, two nursing orderlies, a batman, and two R.A.S.C. drivers. The Middle East scale of equipment is sufficient to provide a complete operating team, but all accommodation of the patients before and after operation and all nursing are provided by the medical formation to which the unit is attached. This equipment can be summarized in the following way. Two tents, one large and one small, are used as a theatre and a sterilizing room. Enough instruments are carried to tackle any case that may arise, but the numbers of these instruments are kept down to a reasonable figure. Tents are also carried to accommodate the personnel. In addition, a reserve of stores—particularly plaster, anaesthetics, and dressings—is taken to deal with about a hundred cases without replenishment. With these provisions a Field Surgical Unit can join a Field Ambulance, a Field Dressing Station, or a Casualty Clearing Station, and provide or supplement the surgical facilities of that unit.

From December, 1942, to June, 1943, our unit was with the Eighth Army during the advance to Tripoli and Tunis. In September, 1943, it accompanied the invasion forces to Salerno. Here the work was of two types—the phase of forming and consolidating the bridgehead and then the subsequent advance through Italy. Under these three varying conditions it has been found that the basic principles—partly learnt by bitter experience and partly handed on to us by our predecessors during the long months of fighting in the desert—have not been found wanting. Minor alterations only have been necessary to cope with the changing conditions.

These principles may be described under the following headings: (1) co-operation with the parent unit; (2) minimizing fatigue; (3) note-recording; (4) extra equipment and comforts.

## Co-operation with the Parent Unit

A Field Surgical Unit can be regarded as a graft on to a larger medical formation, and, like a graft, retains its entity but has to fit in with the host; unlike a graft, the host may be changed repeatedly, and the unit must be self-contained but adaptable. We feel that it should be an operating unit, pure and simple, which can handle its own equipment without calling on any outside aid. There is a danger that over-elaboration and attempts to increase the facilities carried and the scope of its capabilities may cause this essential to be forgotten. No host unit welcomes a request for help in setting up a theatre when their personnel are fully engaged in their proper and routine duties. Not all units to which one may be attached will have had previous experience of working with a surgical unit, and, even if they have, every team has its own peculiarities and foibles. We have found every unit with which we have worked more than willing to fall in with the suggestions offered. If these are made right at the beginning co-operation starts on the proper basis and minor frictions and irritations are avoided. There are several points that are always well worth stressing, and they can be divided into two categories—pre-operative and post-operative.

In the pre-operation or resuscitation ward, quite apart from the treatment of shock, much valuable time can be saved by the proper preparation of the patient before he goes into the theatre. This does not mean the whole routine of shaving and washing the affected area—indeed, this is better done under the anaesthetic—but rather attention to the sufficient removal of clothing, the adjustment of clean blankets, and adequate premedication. It is not enough to cut away the sleeve of a shirt or the leg of a trouser; each garment must be removed completely. A blanket which is heavily soiled with blood is a hindrance to resuscitation and a discomfort to the patient after operation; it is much better removed in the pre-operation ward than in the theatre.

Regular pulse and blood-pressure readings form an invaluable guide in assessing the response to resuscitation and the optimum time for operation. Intelligent orderlies can easily be trained to do this and record the readings for each case of any severity. In carrying the patient to and from the theatre we have used our R.A.S.C. personnel. Once they are trained in the routine it makes for greater speed and efficiency. The situation of the pre-operation ward is important. It must be as close as possible to the theatre: directly adjoining it is the ideal. The surgeon will need to make frequent visits between cases to watch both the work still to be done and the progress of the cases still being resuscitated. If these visits involve a long walk down a dark corridor or across the open, tripping over guy ropes at night, there will be increased fatigue, waste and loss of time. It is noticeable how slowly one accommodates to the dark after concentrated work in the theatre.

The post-operation ward, if accommodation allows, should be reserved for the seriously wounded cases which will need special care and attention. If every minor case is sent there, awaiting evacuation, the nursing staff will be unable to devote proper time to the more difficult patients. We have made it a rule to write post-operation instructions in fair detail on the Field Medical Card for all serious cases. Until the orderlies have become accustomed to the methods and routine, frequent visits have to be made to the ward to ensure that all instructions are being carried out. Although the parent unit will usually detail an officer to look after the cases after operation, the responsibility naturally rests with the surgeon.

During a prolonged spell of work there is a great temptation to get away to rest or bed when a lull occurs, and the anxieties and repeated requests for opinion and advice from a ward full of "belly" cases can become a great strain. This almost hour-to-hour supervision must be done, however, if tragedies are to be avoided.

We have found that the orderlies are all keen to learn and soon develop an appreciation of the various procedures. Once this appreciation has been achieved things are easier, but they must be watched very carefully during the interim stage.

## Minimizing Fatigue

One of the most pressing problems of forward surgery is the mental and physical fatigue that is inevitable during a heavy rush of casualties extending over several days. This is especially so when the team is the only operating unit attached to a Field Ambulance or Field Dressing Station. When there is more than one team the onset of fatigue can be postponed by adopting the shift system. An operating team can carry on for many hours before the members are so tired that they have to stop from sheer exhaustion, but there is a stage when judgment and operative skill fall far below a satisfactory standard. This acute fatigue must be distinguished from the chronic variety which comes on insidiously after weeks of steady and unrelieved operating.

There are several ways in which the powers of the team can be conserved. It must be realized that it is not only the surgeon who bears the strain but the team as a whole. The operating-room staff will have to spend much time preparing the theatre before operating and cleaning up after the last case. Probably the most important factor is the strict working to a routine. Every man should have his place in the scheme and keep that place. The surgeon will then be able to relax until everything is ready for the start of the actual operation. In a short time the orderlies become remarkably efficient, not only in preparing the patient but also in spotting unadvertised

wounds and subcutaneous foreign bodies. It should only be necessary to tell the O.R.A. the nature of the next case for him to have ready all the routine splinting, plaster slabs, and bandages that will be required. To achieve this routine it is as well to practise during any preliminary training period many of the more important duties. This should include such things as tent-pitching, the off-loading and loading of lorries, the setting up of the theatre, and the preparation and application of some of the larger and more intricate plasters.

Any extraneous noise is distracting, and there should always be at least a short passage and a double screen between the theatre and the ward. While visitors are welcome, we insisted that the numbers of spectators and helpers should be kept down to a minimum. If the case is not a serious one the instruments are used on the cafeteria system: a complete set is laid out on the Mayo table and sufficient taken for the case; this reduces sterilization as much as possible. On the ordinary case we have not found it necessary to have a "washed-up" assistant. With the limited numbers of orderlies available it is better to keep them free to help in moving the patient, put on bandages, or clean and sterilize the instruments used on the previous case. Hot sweet tea is excellent for reviving a flagging team, and a constant supply between cases is most welcome and valuable. (A minor point worth mentioning in this connexion is the desirability of having a latrine fairly close to the theatre.) There is some difference of opinion on the question of using one or two tables. A team working with two tables can achieve a faster rate of turnover but there is a greater strain on all the orderlies. This method is apt to introduce an atmosphere of rush and hurry that must be avoided at all costs. There is a limit to the number of cases that can be cleared in a given time, and working with two tables is liable, in our opinion, to hasten the onset of the danger-point in fatigue.

When working as a solo team it may be difficult to get enough time for sleep. Every lull must be utilized to the full, and even then it may become a matter of short sleeps at irregular intervals. It is important that the men should have sleeping quarters which are close to the theatre and quiet at all times. Rest periods must not be disturbed to allow the men to attend the routine unit meal-times, and the parent unit will usually arrange that something is available at the cook-house at any time. Much of the strain falls on the O.R.A., and we have found that he will benefit by a morning or afternoon right away from the camp every now and then. A trip to the medical stores or with a patient to another medical unit makes a good break. This has the further advantage that it accustoms the other orderlies to working without him, a safeguard in the event of his becoming a casualty.

#### Note-recording

It need scarcely be pointed out that operation notes must be full, accurate, and easily read. This last requirement is the most difficult; even with the clearest of writing it is not easy to make the essential features of a case stand out from a closely written card. When a convoy arrives at a base hospital a rapid survey of all cases has to be made, and it can be very wearying to read through a long description, trying to pick out the salient points. Typewritten notes with bold underlining of all facts of importance are by far the most satisfactory, and a typewriter, if it can be obtained, is invaluable. A point often overlooked is the filling-in in block capitals of the diagnosis on the envelope. In addition to any relevant special labels we also made a practice of printing on this envelope any special instructions for the medical units on the line of evacuation. As examples of this one may mention such headings as "Suprapubic cystotomy," "Watch circulation in foot," "Potential gas gangrene." This ensures that these points will not be missed.

During operations the unit clerk has a table reserved for his use in the theatre. His duties are: (a) To check up the particulars of the patient and discover the time of wounding before the start of the anaesthetic; these are entered in the operating book. (b) To type the operation notes as dictated to him during or after the operation. (c) To write a short précis in pencil in the operation book. It is more convenient to write up all the cases at the end of a list than at the end

of each operation. The space between cases may well be taken up in reviewing the pre-operation ward. It is surprising how easy it is to forget the detail of some of the earlier operations, and these pencil notes are a great help. (d) To search the pockets in any discarded clothing, collect the contents, and see that they leave the theatre with the patient.

#### Extra Equipment and Comforts

In addition to the ordinary scale of active service equipment there are a few extras that make the difference between discomfort and moderate comfort. There are two considerations of importance that are antagonistic to each other. First, the unit must remain mobile and the accommodation on the transport is limited. Any large accumulation of non-essential stores will mean that a corresponding quantity of essentials cannot be carried without overloading the lorries. Secondly, prolonged spells of operating on severe and mutilating wounds are somewhat depressing. The efficiency of the unit will suffer if a few extras are not available to allow recreation, relaxation, and an occasional "brew-up" during quiet times. A personal visit to the N.A.A.F.I. will usually secure sufficient tea, milk, and sugar and other minor comforts. We carry with us a small library for the men, which is changed when possible. Penguin books are a convenient size and can often be exchanged with other units. Gum-boots, a leather jerkin, a small primus stove of the collapsible type, a clasp knife with a strong tin-opener, and a spare roll of toilet paper are all items well worth carrying, if they can be obtained.

It is not claimed that this article contains any profound observations or original points—others who have worked in forward areas may disagree with some of our opinions—but it is an attempt to describe some of the things that we did not know when we started out and which we know now. It has been our good fortune to have a close liaison with the units to which we have been attached and the base hospitals to which our cases have gone. We record with great pleasure our thanks for the help that they have given us and the kindness they have shown us. For reasons of security they must remain anonymous. We also wish to record our thanks to Col. C. Donald, Consulting Surgeon, Eighth Army, for his help with this article.

#### ADDENDUM

*The following explanatory note has been added by the Army Medical Department, War Office.—ED., B.M.J.*

Surgery with a relatively independent mobile team and at a forward centre in the field has always made a strong appeal to the imagination; the views expressed in this article backed up by considerable experience should prove both welcome and valuable at the present time when a considerable number of Army surgeons are posted to Field Surgical Units. It is hoped that this note will assist those who are not conversant with the organization of the forward surgical service in the Army, without detracting from the merits of the article. The lay mind, attracted by the idea of providing expert surgery well forward in the battle zone, is too apt to forget that unless adequate rest and post-operation nursing are also provided the benefits of surgery may be completely lost. Operation is only one stage in the treatment. A proportion of the severely wounded men whom an advanced surgical centre must treat cannot be moved in under seven to ten days without grave risk.

The employment of Field Surgical Units is governed by two definite limitations: (a) The unit is designed for operating only; it cannot hold or nurse patients after operation. Consequently, this one-team unit is not self-supporting in the medical sense, although independently mobile; it carries the necessary surgical equipment—a tented theatre, with bivouacs for the personnel—but possesses neither ward accommodation nor staff for post-operation nursing. It must, therefore, be attached to a unit capable of providing both. (b) Again, there is a limit to the number of wounded the unit can deal with in any one day. Sixteen to twenty serious wounded may be regarded as a capacity load for 24 hours; of these, the last four or five may have to wait 15 to 16 hours for their turn on the table. Delay of this length may well prejudice their chances of recovery. Herein lies the necessity for good triage. The unit must not be permitted to become "cluttered up" with patients who can be evacuated.

### Surgical Centres: their Formation and Siting

The term "surgical centre" implies the existence of facilities not only for major surgery but for holding and nursing patients up to 14 days, if necessary. The Forward Centre for the troops of fighting formations is normally formed by a C.C.S. which can provide all the requisite facilities. It carries two surgical teams. Surgical reinforcement is provided as required by attaching Field Surgical Units. An Advanced Centre is established only when the distance between the evacuating units (Field Ambulances) and the Forward Centre is such that the "time-lag" for the serious wounds is beyond the margin of safety. This Centre is formed by attaching two or more Field Surgical Units, usually with a Field Transfusion Unit, to a Field Dressing Station, light section of a C.C.S., or a static Field Ambulance. It is seldom possible to post Army Nursing Officers (Q.A.I.M.N.S.) to an Advanced Centre, so that the standard of nursing and accommodation is not so high as that at the normal centre. These disadvantages are unavoidable: the additional risks are justified and offset by the urgency of the surgery.

## Correspondence

### Prevalence of Ketosis in Children

SIR.—It is regrettable that following Dr. Evans's excellent description and careful observations in cases of "sick stomachache" (March 25, p. 432) it is the end-results that are stressed and treatment advised to neutralize them, while the causative allergic basis is not realized so that the proper prophylactic treatment can be inaugurated.

During the past fifteen years, in dealing with large numbers of allergic children and adults, I have labelled the various symptoms described by Dr. Evans as "abdominal migraine" to indicate the usual sequel. These symptoms occur extremely commonly in everyday practice, and their allergic origin is totally unrecognized. As in most illnesses of young children abdominal symptoms are most obvious, so in the parent's history they predominate—lack of appetite, abdominal pain, nausea, or vomiting, often accompanied by a sudden high temperature up to 104° F. for a few hours. Perhaps only one of these symptoms will be present in each attack, but sooner or later others appear, and new ones may replace former ones. It is only towards puberty that the children voluntarily describe any headache or eye signs, but will admit such much earlier if specially asked. A well-marked family history of migraine, sick headaches, or other allergic conditions can be elicited usually, as well as other allergic conditions in the individual sufferer.

The attacks may be due to a sensitivity to environmental articles (bedding, pillows) if appearing predominantly in the night or on waking, and to foods if in the day. But later most cases show a combination of both groups of allergic factors, and the apparent exciting cause appears to be some non-allergic factor which lessens or depletes the protective adrenaline production—the nervous or physical exhaustion mentioned by Dr. Evans, or, more correctly, a chemical exhaustion. The primary factor is not so much faulty fat metabolism as that the "fatty" foods are those to which children are most commonly allergic—milk and other dairy products, egg, pig products, chocolate, and fish-oil emulsions. Glucose proves beneficial because it provides immediate essential energy, in itself never producing allergic reactions, and diminishing the "acidosis." A high percentage of cases, and especially those with a poor appetite, show a low curve of free hydrochloric acid on fractional gastric analysis.

The most effective treatment in these cases is to skin-test the child to determine the causative allergen and avoid the cause if possible; medicinally, to give, say, to a child of 7 years, 15 m of dilute hydrochloric acid B.P. in a wine-glassful of water at the beginning of each meal, 1/2 gr. of ephedrine hydrochloride at bedtime, and 3 to 4 tablespoonfuls of glucose a day in drinks. An acute attack can frequently be cut short by a hypodermic injection of 3 to 5 m of adrenaline chloride, 1/1,000 solution, as the intense abdominal pain is

due to a spasm of the smooth muscle of the bowel together with some urticarial oedema of the mucous membrane with the consequent retention of faeces. In severe cases of abdominal migraine it has been my custom to give the mothers a note stating in my view the nature of the case, and asking that the appendix be not removed unless there is very evident proof of its inflammation; since when the incidence of useless appendicectomies in these cases has lessened.

Let us recognize the true basis of cyclical vomiting or sick stomach-aches in childhood and prevent the sick headache or migraine of later life, so that the Home Guards of the next war will not be heavily fined for missing a parade on account of a migraine attack, and the consequent indignation caused among Members of Parliament, where so many bad sufferers seem to be congregated, may be allayed.—I am, etc.,

London, W.1.

GEORGE BRAY.

### First Aid for Burns

SIR.—The letter from Col. Colebrook (March 4) calls for some observations. No clue is given as to the time when Col. Colebrook began this investigation because of "the absence of an agreed policy with regard to the first aid for burns." One had thought that as long ago as 1941 surgeons with wide experience of the treatment of burns and scalds were firmly agreed as to the policy which should be adopted for first-aid treatment—viz., all patients with extensive burns (of more than 5% of body surface), or burns complicated by other injuries or which involve the face, hands, feet, or eyes, should be treated only for shock as a first-aid measure and should receive further treatment at a hospital, to which they should be removed as rapidly as possible. A practical and detailed scheme of first-aid treatment for burns of all types is set out in E.M.S. Memo. No. 7 issued by the Department of Health for Scotland (June, 1941; price 2d.). I am not aware of any knowledge which has since come to hand which does not bear out the principles laid down in this memorandum, apart from the recommendations in it with regard to the use of tannic acid.

It is surprising that the covering of extensive burns with a clean cloth of some kind is not specifically mentioned by Col. Colebrook, in view of the emphasis laid on the danger of contamination by streptococci. It would be interesting to know what is meant by "considerable delay" in the "full-dress treatment" of severe burns. The decision to delay treatment in such cases is a serious responsibility, and such interim treatment as the application of the "Glasgow No. 9 cream" can hardly be called "first aid" under these circumstances. It appears that the potential seriousness of a thermal injury of 10% of the body surface is still imperfectly appreciated. It is not clear on which type of burn the cream may be left for only two days. I should be interested to know whether the extensive clinical trials of the cream included estimation of blood sulphonamide level and tests of liver function.

Finally, one wonders who is to apply the cream as a first-aid dressing. The injunctions regarding the prevention of streptococcal infection are admirable in theory but are evidence of a lack of appreciation of the circumstances under which the cream may be used. Even if the cream is obtainable, such precautions as masking and washing of hands are difficult to observe in the average tenement of a Scottish town, as Col. Colebrook should know from his recent experience in Glasgow, and equally difficult during or after an air raid. Under these circumstances plastering the burn with cream is a waste of time, and must be classed as meddling and valueless.—I am, etc.,

Edinburgh.

A. W. WILKINSON.

\* \* We have sent a copy of the above letter to Col. Colebrook, whose reply follows.—ED., B.M.J.

SIR.—The investigation of first-aid procedures referred to in the *Journal* (March 4, p. 342) was begun in May, 1942. I had not then heard (nor did I until last week) of the pronouncement (June, 1941) by the Department of Health for Scotland to which Mr. Wilkinson refers. Unless that pronouncement includes full bacteriological evidence as to the efficacy of the first-aid measures recommended for warding off infection by haemolytic streptococci I still think there was a good case for



the investigation carried out by my colleagues and myself in Glasgow. Even now I maintain that there is no agreed policy with regard to first-aid treatment.

Mr. Wilkinson will find the details he asks for in the full account of our investigations, to be published in the forthcoming (April) issue of the *British Journal of Industrial Medicine*. I agree that the "covering of extensive burns" with a clean cloth is ideal—but is seldom practicable. I also fully agree with him as to the difficulty of applying first-aid treatment in many circumstances. It cannot be too strongly urged that most burns should simply be covered with something sterile, or at least "socially clean," and sent straight to hospital. Well-meaning "first aid" will often do more harm than good if the circumstances do not allow it to be carried out aseptically.—I am, etc.,

Burns Unit, Birmingham Accident Hospital. LEONARD COLEBROOK.

### Symptoms of Air in the Mediastinum

SIR,—In your issue of Oct. 23, 1943 (p. 533), a question was asked concerning a patient with a supposed "pleuro-pericardial tub." May I suggest that the signs and symptoms in this patient were quite in accord with those found in benign pneumomediastinum. The sudden onset, the severe substernal pain aggravated by exertion, adventitious sounds over the praecordium (due to the beating of the heart and the movement of the lungs against a pleuro-pericardial fold distended with air bubbles), which altered or disappeared with change in posture, the regression of symptoms within a week or ten days, and the recurrence of the condition, are all not only compatible with the diagnosis of air in the mediastinum but might almost be designated as classical features of pneumomediastinum. In the event of a recurrence in this patient or the appearance of similar symptoms in others, an x-ray picture should be taken—not the usual antero-posterior one which obscures the presence of air beneath the sternum, but a lateral one, which will reveal the air.

Pneumomediastinum may occur under a wide variety of conditions which fall for the most part into two main categories: (1) excess physical exertion, such as running, lifting heavy weights, straining in any way; the onset may be a day or more after the exertion or immediately following it. (2) Respiratory infections involving atelectasis in some areas of the lung, which areas may be small, with compensatory over-inflation in others. The infection may be very mild, even unsuspected, or it may be severe. A combination of (1) and (2) may occur.

Pneumomediastinum may be benign and clear up spontaneously with reabsorption of the air; it may be followed by a rupture of the mediastinal pleura with a resultant pneumothorax, or of the fascial planes of the neck with a resultant subcutaneous emphysema. It may be fatal if: (1) the contained air does not escape from the mediastinum and raises the pressure there to the point at which circulation through the heart and great vessels of the thorax is dangerously impeded altogether inhibited; (2) the pneumothorax should prove to be bilateral. (3) if the air in the pleural cavity is under too high a tension. It may be relieved in those cases in which it threatens to be fatal by inserting a hollow needle into the mediastinum at the side of the sternum, or a catheter into the base of the neck and pushing it down to the site of the encapsulated air, thus allowing for its escape. Pneumomediastinum is much more common than is thought, and should be suspected in all such cases as that reported.—I am, etc.,

London, Canada

MADGE T. MACKLIN.

#### BIBLIOGRAPHY

- Macklin, C. C. *Canad. med. Ass. J.*, 1937, 36, 414.  
— *British Medical Journal*, 1937, 2, 994.  
— *Arch. intern. Med.*, 1939, 64, 913.  
— *Med. Rev.*, 1939, 150, 5.

### Medical Research as a Career

SIR,—The improvement that took place in the organization of medical research between 1919 and 1939 was considerable, but everybody will agree that much more should be done. The most urgent need is for personnel of the required standard. At present the recruitment of men and women is extremely haphazard. Generally it happens that an individual who has

just finished a house appointment feels an urge to investigate some subject while he is waiting for another appointment. The subject chosen is often one that would employ 50 workers for 50 years. With the help of his late chief he gets a grant or scholarship, and at the end of a year writes a report which is useless, and passes on. In a small percentage of cases the researcher is a rather better man and applies for a larger scholarship, and may work very much on his own for a few more years. Unless he is an exceptionally brilliant man he is unable to go further. Many such people fail because they have not been taught how to do research, and, although research workers, like poets, may be born and not made, both require to be taught their A.B.C. It is a truism that research in these days needs a team with a brilliant leader and less brilliant people to help; but under present conditions none but the most brilliant dares to decide on a career of pure research because of the uncertainty of making a living. Even the most brilliant generally have to have a secondary appointment such as teaching in order to make ends meet.

The remedy for these difficulties is to make medical research a profession. The candidate would apply for admission, and if, on general grounds, he was considered suitable he would be sent to a "recognized" institution where a certain piece of work would be assigned to him for a year. If at the end of a year the candidate showed promise, he would be allowed to choose a piece of research that interested him in the same institution or another. At the end of a four-years apprenticeship he would, if considered suitable, be recognized as a member of the research profession. Once admitted to the profession his salary must be assured to him and he must be free to continue his research in whatever direction it leads him, even if this necessitates his being moved to another institution; and if the institution cannot afford his special grade the difference must come from a central fund. Competition, with prospects of financial gain, is necessary in most walks of life including the medical profession, but this does not apply to the born research worker. In the case of the latter it is generally necessary to safeguard him from falling into a financial mess, the worry of which will impede his work.

To summarize, therefore, it seems to me that if better and more research is to be obtained the following are essential: (1) an apprenticeship; (2) an assured income; (3) the absence of any obstruction to the flow of research, even if that flow should take an unexpected turn. I fully realize that these essentials do already exist in some institutions, but the number of such institutions is small.—I am, etc.,

London, W.1.

MALCOLM DONALDSON.

### Returned Prisoners at End of War

SIR,—From my experience of returned prisoners both in this war and the last I offer a few suggestions to remedy the conditions so ably described by Major P. H. Newman in the *Journal* of Jan. 1. The difficulties can be divided into three main groups for treatment in order of importance: (i) psychological, (ii) physiological (gastro-intestinal), (iii) financial.

The immediate desire of all returned prisoners is to see their own families and old localities; this can be provided by sick or privilege leave, but should be limited to a month or six weeks, at the expiration of which reactions set in, so they should report to camps, constructed already all over the country, so that their rehabilitation can start. Their families should be accommodated and accompany them if desired, and live as in married quarters. These camps should be organized by specially selected officers of marked leadership, personality, interested in the object, and endorsed in a superabundance of the "milk of human kindness" and patience. The psychological side should be started and handled by specially trained medical officers, but should not be accentuated or publicized.

The food, its cooking and presentation, should be as individual as possible, but under experienced guidance to reconstitute a delicate and abused digestive system. The organization of the camp should be in the nature of an adventure, and the interest of all be encouraged, the discipline and organization being more on the works' committee idea than the strictness of a Service orderly room.

The financial side is more difficult, but would be worse if the individuals were to compete in the open market, and on

finding their inability to compete with their fellow men would develop a disillusioned, disappointed, aggrieved character at variance with the world. By retaining a man in the Services with his pay and allowances and educating him generally after the A.B.C.A. manner, finding his trade, modernizing him in it by suitable instructors before his release, he will enter the world with a greater confidence in himself and on equal footing as to ability with those more fortunate.

There are two likely factors to upset this Utopia: (i) alcohol, (ii) failure to rouse the initiative, or desire, to work. The first can be overcome by a gradual decrease, either by a system of coupons or by rationing, and making the camp institutes or canteens more attractive, sociable, and comfortable than the outside public-houses. The second is the hardest thing to deal with and will need wiser brains than mine to suggest a method, but it will be a very real state, and there might be a fair number of such cases.—I am, etc.,

C. H. CHAVASSE,  
Major, R.A.M.C.

### First Aid according to St. John's

SIR.—Like many other doctors who teach and examine in first aid, I have been extremely disappointed that there has been no new edition of the St. John first-aid book since 1939. I wonder how many doctors who have themselves to render first aid to a fractured humerus find three little bits of wood and fasten them round the broken bone? or two pieces of wood for a fracture near the elbow-joint? Is not a simple St. John sling sufficient first-aid treatment for a broken collar-bone? Why should we expect to arrest arterial haemorrhage from the palm of the hand by compressing the radial and ulnar arteries when it is known that the interosseous artery continues to supply blood when the two former arteries are compressed? Are all the bandages really necessary which are prescribed for a fractured femur? Why is a bandage tied round the chest for a broken rib? Surely the idea is to immobilize the broken side only, and a bandage, if it is tied tight enough, will immobilize both sides. How can one prevent the onset of poisoning by hypnotics by attempting to keep the patient awake and by slapping his face? How can one hope to use alcohol as an antidote for prussic-acid poisoning when that poison acts in about 20 seconds? Why are "first-aiders" required to treat the bites from rabid dogs when there is no rabies in this country? Why is so much emphasis placed on tourniquets when we know from experience in air raids that a tourniquet is very rarely necessary?

The first-aid examination has to be conducted within very rigid limits, in that the examiner has to ask the candidates specified questions, the candidate being expected to reply on the same lines as are found in the book, and has to repeat all this out-of-date treatment for the benefit of the examiner. Moreover, the lecturers in first aid are frightened to advocate the correct treatment if it conflicts with that in the book, for fear that the ensuing examiner should expect the candidate to reply exactly according to the book. In fact, one is really tempted to ask whether the St. John first-aid book was written when the Knights of St. John of Jerusalem were fighting the Saracens!—I am, etc.,

Colchester.

M. E. LAMPARD.

### Babies in Glass Cages

SIR.—Dr. Clifford Allen underestimates the danger arising out of cross-infections in hospitalized babies. It is an old saying that babies become ill *ex alimentatione* and die *ex infectione*. The prevention of infections is the main aim in the construction of babies' wards. As compared with the paramount importance of infection the problem of "loneliness" is a minor one. The majority of patients in babies' wards are not yet at a sociable age, and those who already show interest in their surroundings find more distraction in the toys, in the work of the nurse and the medical staff than in the sick companions of their room, whom they cannot often even see. Dr. Allen supports his point of view on the authority of Pirquet. Having worked for 21 years at a children's hospital in Vienna may I be allowed to make some remarks with regard to this point. The importance of infections was fully realized

by Escherich and Pirquet in the construction of cubicles for contagious diseases. Ten years ago, when Dr. Allen visited Vienna, Pirquet was dead, and it is my belief that Dr. Allen would have obtained different information if he had had the opportunity of interviewing Pirquet personally. The principle of glass cubicles—for which unfortunately the appalling term "glass cages" has been used by two writers—has been approached in Vienna in the Reichsanstalt für Mutter- und Säuglingsfürsorge. Prof. Parson's plans, according to which the Babies' Block at the Children's Hospital, Birmingham, was constructed, represents a further advance and an improvement on these ideas.—I am, etc.,

Birmingham.

H. S. BAAR.

### Postgraduate Courses for Service Doctors

SIR.—I wish to join in the plea for postgraduate courses for Service medical officers after the war. As individuals, we are fortunate in being members of a profession, but as doctors among doctors we shall occupy, at the end of hostilities, a very humble position technically. There is an opportunity here for the Government, universities, and teaching hospitals to put into practice the good will and concern for our welfare which are so evident in the speeches and publications of their representatives. In addition, it will help the realization of the ideal of "positive health" by convincing the temporary Service medical officer that the effects of belonging to an age group too young to have specialized have not passed unnoticed by the authorities, and, by giving him some assistance in rescuing himself from a life of medical mediocrity, it will enable him to face his civilian task in a manner which will benefit his patients and his fellow men.—I am, etc.,

DAVID G. SMITH, M.B., CH.B.,  
Squadron Leader, R.A.F.

### Treatment of Cerebral Malaria

SIR.—As malaria is being much discussed at the present time the following observation may be of general interest.

I have recently observed four cases of cerebral malaria while medical officer of the Northern District of British Honduras, which is a hyperendemic zone of *P. falciparum*. They were all of the violent manic type, in which it is essential to control the mania before treatment can be adequately given. My experience of such cases is small, and the usual procedure recommended is morphine and/or chloroform to control the mania, which I have tried but found far more satisfactory.

The first case in this group was an adult male Mayan Indian, very violent and quite uncontrollable with my available staff. His temperature was 104° F. and blood smear showed heavy *falciparum* infection. He was obviously very ill. I therefore called upon all my available restraining powers and managed to give him an intravenous injection of sodium-pentothal in the same dosage as for a surgical patient. He immediately passed into a deep comfortable sleep. I then gave 10 gr. quinine bishydrochloride intravenously and 10 m adrenaline subcutaneously. The result was that the patient slept soundly for 8 hours, instead of the expected 1 to 1½ on such a dose. On awakening he was perfectly normal. His temperature dropped, and with a course of quinine 10 gr. i.d.s. and atabrin 0.1 g. t.d.s. for 5 days he had no relapse.

I was very struck with this and gave pentothal immediately to the next case to be admitted, with similar results; this blood smear was negative. I repeated this treatment on two more cases whose blood smears were positive. The last one, a boy of 16 years, did not react so well, but the manic stage passed to a comatose stage which lasted for 3½ days, with slow but eventual recovery; in this case I did repeated lumbar puncture, with intravenous quinine daily for 5 days.

The explanation is probably that there is some dilatation of the cerebral vessels concomitant with a fall in blood pressure brought about by the pentothal, which, with the adrenaline, probably enables the quinine to act more quickly and directly on the parasites. The anaesthetic properties of the sodium pentothal are probably prolonged by the pathologically oedematous state of the brain. Whatever the rationale of this procedure the transformation of the flushed manic to a state of profound and peaceful sleep, followed by a normal

awakening, is an extremely gratifying one to watch. I regret that I cannot quote the cases in detail, but I am not at the moment in contact with their records.—I am, etc.,

J. ANTHONY GILLET,  
Colonial Medical Service, British Honduras.

### Infant Mortality in Scotland

SIR.—Under this heading (March 11, p. 372) Dr. Margaret McGregor advocates the family allowance which was "first sponsored by the Beveridge report." She forgets that it was a feature long before of the Speenhamland system and the old Poor Law, which proved so disastrous both to children and parents that it had to be abruptly discontinued. Dr. Chalmers vehemently denounced the principle as striking at the sanctity of the family, and the report of the 1834 Commission strongly confirmed his charge. Moreover, the policy is implicit in the provision of meals for school-children. Some of us can remember, all of us can refer to the records of, the strenuous debate which raged some sixty-odd years ago on that subject. Many kind people could only see good in the policy; but others, as kind but with more experience and longer vision, as strongly opposed the compulsory provision on the ground that in the end it would be prejudicial to the children; the real remedy was to allow the wages of the parents to continue to increase as they had been doing and as they did do till 1896. That the latter were right seems demonstrated by the much higher survival rate in the later years of childhood and adolescence before 1890 than in this century.

Injudicious kindly legislation can do more harm than deliberate malignity, and the family allowance, seeming so kind, meant so kindly, is really cruel. No one has a right to urge these wild schemes until it is demonstrated that Government expenditure in this century is not responsible for an awful toll of unemployment, only relieved in time of war; for a constant trend to lower wages, again only relieved in wartime; for two formidable rises in phthisis mortality, again only relieved in wartime. That these trends are the reverse of the trend from 1850 to 1895, when Governments first began to assume the role of Providence, should surely make impatient reformers pause before they urge it further on its arrogant course.—I am, etc.,

Sydenham, S.E.24.

B. G. M. BASKETT.

## Obituary

### ALBERT EIDINOW, M.B., B.S.

Dr. Albert Eidinow worked voluntarily in the department of applied physiology at the Medical Research Institute and found evidence that exposure of the skin to ultra-violet rays put up the resistance to staphylococcal infection. At the St. John Clinic and Institute of Physical Medicine he was in charge of the light department and of the pathological laboratory. He was inventive and designed a "daylight" lamp consisting of a long quartz tube giving weak ultra-violet rays, and a number of incandescent lamps hung on each side of this. This lamp gave as near an equivalent to natural sunlight as possible. Flowers and dyes appeared of the same tint under it as under daylight. Such a lamp had its use then in a picture gallery or a milliner's shop. An hour's exposure of the nude body to this lamp gave the same result as a similar exposure to midday summer sun on the seashore. He found this lamp useful in the treatment of psoriasis and cases of lupus in which the local lesion was treated by intense radiation with the Kromayer lamp. He also invented a small ultra-violet lamp which could be introduced into the mouth and used for affections of this and the throat. Members of the theatrical profession gained benefit from this lamp. The general tonic influence of exposure of the skin to ultra-violet rays depended on the production of a slight degree of sunburn erythema followed by desquamation. To keep the skin sensitive he divided the body into four regions, and giving two treatments

a week allowed 14 days to elapse before any one area received another exposure. This saved much time in treatment, for otherwise the exposures would have to become longer and longer owing to thickening of the horny layer and pigmentation. For cases of acute neuritis and fibrositis, swollen painful joints, and traumatic effusions he used what seems to be an ideal method of counter-irritation. Over an area of skin eight inches square above the painful part he gave an intensive dose of ultra-violet rays—enough to produce strong sunburn—and then covered the area with elastoplast bandage. The patient was told on no account to touch this for a fortnight. Infra-red treatment could be given through the bandage. For infra-red treatment he used large incandescent lamps focused by concave metal mirror, recognizing that the red and shorter infra-red rays penetrate the skin deepest. The longer infra-red rays, from sources of dark heat, only warm the surface whence the heat is conducted in, short-wave diathermy being the only means of securing deep heating. He carried out very successfully the treatment of chronic ulcers of the leg, using ultra-violet rays to clean them and elastoplast bandage, telling the patients to walk about, and also when necessary sealing up enlarged veins. Scores of patients were thereby healed of the long-lasting ulcers.

In the pathological laboratory with a skilled assistant he carried out blood examinations, etc., and made autogenous vaccines. These were made not by heating culture fluids but by exposing them in a quartz flask, which was kept rotating between a pair of mercury vapour lamps, whereby a thin layer was exposed to the lethal effect of the rays. He thought this method, which has been used in the U.S.A., gave a better vaccine. Eidinow took an active part in the postgraduate courses given at the St. John Clinic, and was highly appreciated by patients and students. His contribution to rheumatic diseases will be found in the book published by E. Arndel under that title. He wrote many papers for scientific journals.

LEONARD HILL.

### ALFRED ERNEST RUSSELL, M.D., F.R.C.P.

Dr. A. E. Russell, consulting physician to St. Thomas's Hospital and formerly medical referee to the Treasury and to the Civil Service Commission, died at his home at Finchampstead, Berkshire, on March 26.

Born in 1870 the second son of George Russell, he was educated at Roan School, Greenwich, and St. Thomas's Hospital, and graduated M.B. (with gold medal in medicine) in 1894, and B.S. (with gold medal in surgery) in 1895 at the University of London. His early appointments at St. Thomas's were those of house-physician, house-surgeon, demonstrator of physiology, medical registrar, and resident assistant physician; he was also Salters research fellow in pharmacology. He took his M.D. (London) degree in 1897 and the M.R.C.P. in 1900, and was elected F.R.C.P. in 1908. After a few years as assistant physician to the West London Hospital he was appointed to the visiting staff at St. Thomas's, and on his eventual retirement became consulting physician there. In 1909 he was Goulstonian Lecturer before the Royal College of Physicians, his subject being "Disorders of the Cerebral Circulation and their Clinical Manifestations." He examined for the College in materia medica and in medicine, serving for twelve years in all, and was a Councillor in 1928-30; he also examined in medicine for the Society of Apothecaries. Dr. Russell was the author, with the late Sir Percy Sargant, of the book *Emergencies of Medical Practice*, of which the second edition appeared in 1911, and he contributed frequently to the *St. Thomas's Hospital Reports*. During the last war he held a commission in the R.A.M.C.(T.F.) on the *à la suite* staff of the London Territorial Hospital associated with St. Thomas's.

### ALBERT LUCAS, F.R.C.S.

Though he had retired from participation in British Medical Association affairs for many years, the news of the death of Mr. Albert Lucas, formerly of Birmingham, which took place on March 28 at Stratford-on-Avon, will recall to other members a figure at one time prominent in the central west of the Association and a surgeon highly esteemed in the Midlands.

Albert Lucas was born at Bletchley in Buckinghamshire in 1865. He was educated privately, and entered upon the study of medicine at St. Bartholomew's Hospital in 1883, qualifying in 1888, and he obtained the F.R.C.S. in 1891. His early appointments were those of resident medical officer at the Metropolitan Hospital and house-surgeon at Bart's. In 1891 he was appointed resident surgical officer and, two years later, assistant surgeon at the General Hospital, Birmingham. In 1912 he became full surgeon at that hospital, and on his retirement from the active staff in 1925 was elected consulting surgeon. Occasion was then taken to mark his association with the hospital, extending over more than a third of a century, by the presentation of an illuminated address and his portrait in oils. He was also visiting surgeon to the Jaffray Hospital, Erdington, consulting surgeon to the General Hospital, Nuneaton, and to the Birmingham Institution for the Blind, and lecturer in surgery in the dental department of Birmingham University. He was vice-president of the Section of Surgery at the Annual Meeting of the B.M.A. in Liverpool in 1912, and during the last war he had the rank of major, R.A.M.C.(T.), and served the First Southern General Hospital. On his retirement from practice in 1937 many tributes were paid to him in the city where his life work had been done. He was presented by the Lord Mayor with an illuminated address recording in particular his services extending over thirty years as medical adviser to the gas and public works, the water and other departments of the Corporation.

It was in 1909 that Albert Lucas first became a member of the Central Council of the British Medical Association. In 1911 he was honorary general secretary of the Annual Meeting in Birmingham, and to his fine organizing gifts the success of a noteworthy meeting was largely due. He became a representative of his Division in 1913, and so acted at successive Annual Representative Meetings until 1926. In 1922-3 he was president of the Birmingham Branch. His principal services to the Association were rendered on the Journal, Finance, and Central Medical War Committees, where his business ability, firm character, and cool head were of great value, and some years later on the Hospitals Committee. Of the Journal Committee he made an excellent chairman; his business habit of mind was exactly suited to that position during a time of special difficulty. He was chairman of the Journal Committee during the war period, when the *British Medical Journal* had to be carried on with an increasingly depleted staff and, towards the end, with a most inadequate supply of paper of poor quality. Despite all obstacles the *Journal* continued to give to the medical world in general a good account of events and to provide them with reports of the latest advances in military medicine and surgery. The support which the Editor, the late Sir Dawson Williams, received from the then chairman of the Journal Committee was always gratefully remembered and acknowledged. Albert Lucas was one of the least ostentatious of men, content to work behind the scenes for the good of the profession and of the Association of which he was for so many years a loyal member.

Capt. THOMAS MORRIS BEVERIDGE died suddenly on Feb. 12 at Salisbury, Southern Rhodesia. Born at Roseneath, Dunbartonshire, on March 3, 1906, son of the Rev. and Mrs. T. L. Beveridge, his own mother a doctor, he had made up his mind at an early age to follow in her footsteps. He was educated at George Watson's College, Edinburgh, and graduated M.B., Ch.B.Ed. in 1929. After a house-surgery at Barnsley and a short period of work in Glasgow he went out to Livingstonia as a medical missionary. During a spell at home in 1937 he took his D.P.H. Glasgow and then returned to South Africa to work in the City Health Department, Salisbury. He joined the Southern Rhodesian Medical Corps shortly after the outbreak of war. With his generous nature and cheerful disposition he made many friends both at home and abroad. He was very happy in his work and was very proud of his African regiment. He is survived by his wife.

Dr. SIDNEY DUKE TURNER, who died on March 23, will be mourned by a large circle of friends, professional colleagues, and grateful patients. The son of a medical man, he was born at Lewes in 1874. He was educated at Epsom College, passing on to St. Thomas's Hospital, where he qualified as M.R.C.S., L.R.C.P. in 1897, and Durham University. Graduating in 1900 as M.B., B.S. (M.D. in 1902), he went to Purley, and for forty

years bore the major share in a large general practice. He was indefatigable in the care of his patients, and most sympathetic in all his dealings with those in trouble, and was rewarded by winning to a remarkable degree their confidence and real affection. He was a sound and well-qualified general physician, specially successful in the treatment of children, and a most skilful and experienced obstetrician. Turner was a man of robust health and abounding energy, and had numerous interests, both professional and social, apart from the duties of his practice. He joined the B.M.A. in 1901 and served as chairman of the Croydon Division in 1930-1. He was surgeon to the Purley War Memorial Hospital from its establishment as a cottage hospital in 1899, and for many years chairman of its committee of management. He was chairman of the local District Nursing Association and took a keen and practical interest in all matters connected with Epsom College and St. Thomas's. There were few local efforts for the social and religious welfare of Purley of which he was not an active supporter; he was founder-member and past president of the Purley Rotary Club and for thirty years churchwarden of the parish church. He was keen on all outdoor sports, a strong tennis player, and enjoyed nothing so much on his free Saturday afternoons as to watch international or interhospital football, or cricket at the Oval. He was compelled under medical advice to retire from private practice just before the outbreak of war, but retained some of his public activities. Increasing ill-health, however, compelled him to relinquish these one by one, but his interest in them remained keen to the end. In 1901 he married Lilian, daughter of Sir James Wainwright, then treasurer of his old hospital, and he leaves a son, Lieut.-Col. Richard Duke Turner, M.D., M.R.C.P., who is now serving in the R.A.M.C., and four daughters.

We regret to announce the death of the Rev. SAMUEL HANNA, B.A., M.B., minister of Berry Street Presbyterian Church, Belfast, since 1912. Hoping to increase his power for good, and with the consent of his parishioners, he took up the study of medicine and graduated at Queen's University, Belfast, in 1926. He was then able, in combination with his duties as a minister, to carry on general practice. Many of his parishioners also came to him for medical advice, so that he was able in a unique way to minister to every side of his patients' need. He is survived by a son, Dr. William Hanna, who is in practice in the city of Belfast.

We have received the following tributes to Acting Wing Cmdr. D. S. BATEMAN, whose death in a flying accident overseas was recorded in our Services column last week:

J. J. C. writes: Donald Bateman was probably more widely known among R.A.F. personnel than any other Volunteer Reserve officer in the medical branch. This arose partly from the fact that he worked in the R.A.F. Officers' Hospital in 1940 and 1941, but mainly as a result of his sensitive and most attractive personality. He took a deep personal interest in all his patients, an interest which extended beyond their medical condition into the broader aspects of their individual personal problems. In consequence many of his patients became, and remained, close personal friends. The news of his premature death will strike a note of sorrow in the hearts of many R.A.F. personnel widely scattered in all parts of the world. Although Donald Bateman at the outbreak of war was practising paediatrics, he had a wide knowledge of general medicine and an excellent clinical judgment. Apart from professional subjects he had a really remarkable diversity of interests, which embraced music, literature, and art. By his friends he will be remembered as a most delightful companion who could talk and argue on any subject. He wrote with ease and facility and might well have made a reputation as a writer, though his only published book is a biography of Lord Moynihan.

C. P. L. writes: We who worked with Donald Bateman for the short time he was on the honorary staff of St. Mary's Hospital, Manchester, had learned to appreciate his merits as a colleague. He was unassuming but quietly efficient and, as we know from his previous work, of an original turn of mind. He was also unselfish and hard working and was beginning to take a large share in routine work and in teaching. His writing had already been considerable. Undoubtedly, his untimely death has robbed our paediatric world in Manchester of one who would have added much to its strength at home and its prestige externally.

K. N. I. writes: Donald Bateman and I went through Oxford and St. Thomas's together. He had strong leanings towards writing, and in the early days discussed giving up medicine more than once. After being housemen at St. Thomas's together, we were appointed paediatric internes to the Bellevue Hospital, New York City, and it was here that Donald first found his real enthusiasm for medicine. He was very fond of children, and their sufferings awoke in him an urgent interest in their relief; I have often seen him make a late round when he was off duty just to see that they were all comfortable. He had a trick of discussing things with children as though

they were grown-up which made him greatly loved—as my own daughters will readily confirm. Our ways have run together ever since; we were in Vienna together, and up to the war were continually meeting. He went into the R.A.F., I into the R.A.M.C.; fate even sent us abroad in the same convoy. I saw him last in 1942 in Iraq, when we spent a week together. He was still the same Donald and had managed to get himself put in charge—in addition to his usual duties—of a hospital for the children of native troops; his entry into the ward was heralded as ever by demonstrations of delight.

## Universities and Colleges

### UNIVERSITY OF CAMBRIDGE

At a Congregation held on March 11 Daniel Georges Edouard Cordier, formerly Professor of Physiology at the Ecole Nationale Vétérinaire d'Alfort in the University of Paris, received the degree of Master of Arts (*honoris causa*).

The degree of M.Chir. was conferred on A. G. McPherson, and the M.B., B.Chir. on J. S. Pegum, both by proxy.

### UNIVERSITY OF LONDON

Prof. J. M. Mackintosh, M.D.Glas., F.R.C.P.Lond.&Ed., D.P.H., has been appointed as from Oct. 1, 1944, to the University Chair of Public Health tenable at the London School of Hygiene and Tropical Medicine. He was formerly Chief Medical Officer to the Department of Health for Scotland and since 1941 has been Professor of Preventive Medicine in the University of Glasgow.

## The Services

Col. (local Brig.) G. Covell, C.I.E., V.H.S., and Col. W. R. Stewart, C.I.E., V.H.S., I.M.S., have been appointed Honorary Physicians to the King, in succession to Major-Gen. (local Lieut.-Gen.) Sir G. Jolly, K.C.I.E., and Major-Gen. A. C. Monro, C.B., I.M.S. (ret.), respectively.

### CASUALTIES IN THE MEDICAL SERVICES

*Prisoners of war.*—War Subs. Capt. W. H. McDonald and C. B. Meldrum, R.A.M.C.

*Reported missing, believed killed on active service.*—Surg. Lieut.-Cmdr. L. Merrill, R.N.

*Reported killed in action in Burma.*—Capt. J. T. Robinson, R.A.M.C.

*Died.*—Capt. E. M. Gracc, R.A.M.C.

## Medical News

Mr. J. Johnston Abraham will give the Thomas Vicary Lecture on "The Early History of Syphilis" at the Royal College of Surgeons of England on Thursday, April 13, at 4 p.m.

At a meeting of the Eugenics Society on Tuesday, April 18, at 5 p.m. in the rooms of the Royal Society, Burlington House, Piccadilly, W., Mr. D. Caradog Jones will speak on "The Standard of Living." All interested in this subject are invited to attend.

At the sessional meeting of the Royal Sanitary Institute to be held on April 26 at 3.30 p.m., Dr. George F. Buchan, M.O.H. for Willesden, will read a paper on "Social Problems and Health"; on May 23 at 2.30 p.m., Mr. H. J. Manzoni, city engineer and surveyor, Birmingham, will read a paper on "Sanitation in Post-war Building." Every Fellow, Member, and Associate of the Institute may introduce one stranger to the sessional meetings.

A meeting, under the chairmanship of the Lord Mayor of London, will be held in furtherance of Hospitals Day, at the Mansion House on Friday, April 28, at 3.30 p.m., when the speakers will be Lord Luke, chairman of Hospitals Day, and Mr. Henry Willink, Minister of Health.

Sir George Elliston, M.P., has been appointed chairman of the Board of Management of the London School of Hygiene and Tropical Medicine in succession to Sir Holburt Waring.

Dr. Christie McGuire of Dooars, Bengal, has prepared a stencilled note on quinine, primarily written for the use of assistant medical officers in tea-garden practice, but the method of preparing quinine sulphate injections may be useful elsewhere. Copies can be had from the Secretary, Indian Tea Association, Royal Exchange, 2, Clive Street, Calcutta.

## Medical Notes in Parliament

### Penicillin Committee

In the House of Commons on March 22 Sir ANDREW DUNCAN, in reply to Mr. R. Duckworth, who asked about the composition of the *Penicillin Committee* and what were its connexions in the drug trade of each member, said the Sir Henry Dale, President of the Royal Society, had accepted an invitation to be the chairman of the committee. Mr. Arthur Mortimer, deputy director of medical supplies, Ministry of Supply, until recently the chairman, would act as vice-chairman and the other members of the committee were: Dr. V. D. Allison, Ministry of Health; Lieut.-Col. H. J. Bensted, Army Medical Department, War Office; Prof. R. V. Christie, Medical Research Council; Prof. A. Fleming, St. Mary's Hospital; Prof. H. W. Florey, School of Pathology, Oxford; Dr. C. R. Harington, Medical Research Council; Dr. I. M. Heilbron, professor of organic chemistry, Imperial College of Science and Technology, and Scientific Adviser to the Ministry of Production; Prof. R. P. Linstead, deputy director of scientific research, Ministry of Supply; Prof. H. Raistrick, London School of Hygiene; Sir Robert Robinson, Dyson Perrins Laboratory, Oxford; and Sir Russell Wilkinson, military medical adviser, Ministry of Supply; together with representatives of firms engaged in the production of penicillin.

*Army Leave for Examination Purposes.*—On March 28 Mr. LIDDALE asked the Secretary of State for War if a medical officer in the Army with English qualifications must forgo any leave due to him if he wished to sit for Scottish medical examinations. Sir JAMES GRIGG: While a medical officer is not given additional leave, he is allowed to draw on the next period of privilege leave due to him in order to sit for the examination. I need hardly add that these rules apply to all officers, no matter where they have acquired their present qualifications or where they wish to acquire further qualifications.

*Chiropody.*—On March 28 Mr. SILKIN asked the Minister of Health whether chiropody treatment would be included in the proposed comprehensive medical service; and whether he would, in the meetings he was about to hold with interested parties and organizations, include the two national organizations comprising chiropodists. Mr. WILLINK replied that where the help of a chiropodist was needed in providing the full medical treatment for which the new service would be designed, that help must clearly be enlisted. In so far as any special arrangements were required to secure this, he would not hesitate to consult the appropriate organizations.

### Notes in Brief

There are two scales of salary in Nigeria for Government medical officers who are required to have similar minimum professional qualifications: those not domiciled in West Africa and appointed to the *Colonial Medical Service* start at £560 and rise by increments to £1,200; those domiciled in West Africa and appointed locally start at £400 and rise to £720.

At Dec. 31, 1943, the latest date for which figures are available, the numbers of tuberculosis cases awaiting institutional treatment provided by tuberculosis authorities in England and Wales were 529 children and 2,752 adults. Of these 233 children and 189 adults had non-pulmonary disease.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In England and Wales there was a general rise in the incidence of infectious diseases. The increases in notifications over last week's totals were: scarlet fever 180, measles 128, whooping-cough 120, acute pneumonia 106, diphtheria 61, dysentery 61. The incidence of measles has risen for ten consecutive weeks, but the disease is prevalent in only a few counties: 1,159 cases, slightly more than one-half of the total, were notified in the four counties of London, Kent, Essex, and Lancashire. The chief fluctuations during the week were in Lancashire, Essex, Middlesex, and London, where the total of notified cases rose by 146, 106, 61, and 42 respectively, and in Norfolk and Wiltshire, where the total of notified cases dropped respectively by 109 and 46. For the sixth consecutive week the notifications of dysentery have exceeded 200. No fresh centre of infection was reported during the week; the total increase was due to higher notifications in established outbreaks. The largest returns were Lancashire 60 (Manchester C.B. 40), London 37, Middlesex 28, Surrey 21, Essex 18, Derbyshire 12, Yorks West Riding 11.

In Scotland the weekly total for notifications of diphtheria rose by 44, for dysentery by 42, and for measles by 39. The incidence of diphtheria reverted to the level at which it had been almost constant until the fall during the previous week. The only large new outbreak of dysentery was that of Dumfries County 18. The notifications of dysentery in Glasgow and

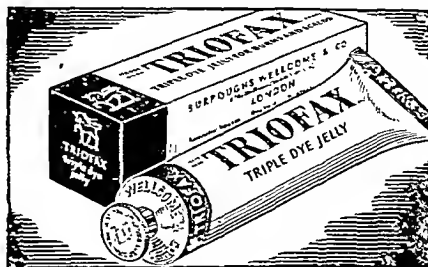


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Edinburgh were almost doubled, with a total notification of 1 and 18 cases respectively. The largest rise in the local incidence of measles was in Renfrew C., Greenock B., where the cases rose from 14 to 32.

In *Eire* the total weekly incidence of measles fell by 118 cases. A decrease of 69 was recorded in Dublin C.B.

In *Northern Ireland* the incidence of scarlet fever decreased by one-third, 42 cases. 50 of the total of 85 cases were recorded in Belfast C.B.

#### Smallpox

A mild case of smallpox has been notified in North Dorset, the patient being a woman teacher of one of the Yeovil schools. The source of infection has not been established, but it is understood that the woman visited South Wales a fortnight ago.

#### Week Ending March 25

The notifications of infectious diseases in England and Wales during the week included: acute pneumonia 1,270, scarlet fever 2,389, whooping-cough 2,244, diphtheria 666, measles 2,759, cerebrospinal fever 101, dysentery 274, smallpox 1, paratyphoid 6, typhoid 9.

#### Last Winter's Health

In a review of the winter's health at a Press conference last week Sir Wilson Jameson recalled that in the week ended Nov. 20 there were over 100 deaths from influenza in the great towns. In the weeks ended Dec. 11 and 18 deaths were over 1,100. This wave constituted the only influenza epidemic to occur during the war years, the last comparable epidemic being in the winter of 1936-7. As always with influenza, there had been a great deal of respiratory disease such as bronchitis and pneumonia. These were very prevalent at the tail end of the year, particularly before Christmas. There were a large number of deaths, mainly among old people. As a result the December quarter death rate was the highest for any December quarter since 1918. The corrected infant mortality rate for 1943 had been estimated provisionally at 50; figures for the earlier years were: 1939, 51; 1940, 57; 1941, 60; and 1942, 51.

A big decline in deaths from diphtheria was recorded in 1942. The provisional figures for 1943 will disclose a new low record, being about 30% lower than in 1942. "This is very good," said Sir Wilson. "The fall in deaths is a definite sign that the great effort to get children immunized throughout the country—a move in which the Press has played no little part—is having an effect."

Referring to the recent outbreak of smallpox in the vicinity of London, Sir Wilson said that, so far as could be judged, no further cases were likely to arise. Activities at the hospital concerned were again normal. He stressed that the amount of work involved even in a small outbreak of this kind was "almost unbelievable." There were eleven cases, but they necessitated a most detailed inquiry into about 3,000 contacts. The movements of each of these 3,000 people had to be checked. Medical officers of health all over the country had to be notified of contacts in their areas. Each person concerned was offered vaccination or re-vaccination. Library books used by contacts had to be traced and if necessary destroyed; articles of laundry had to be recovered; there was a search for a barber who had shaved contacts and cut their hair.

#### Medical Relief in Europe

An outline of the medical aspects of post-war relief in Europe was given by Dr. Melville Mackenzie, one of the Ministry's medical officers, who was chairman of the Medical Advisory Committee of the Inter-Allied Committee for Post-war Requirements. He said that so far as medicine was concerned it was possible to forecast fairly accurately the problems that were likely to arise during the post-war period as the countries of Europe were liberated. In the aftermath of the last war more people died from preventable diseases and starvation than were killed in the war itself. The first problem to be faced was that of malnutrition. Until a reasonable standard of nutrition was achieved it would be very difficult to do effective medical relief work. The second big medical problem would be the re-establishment of medical services. It would also be necessary to convey to the doctors, professors, and medical students of European countries details of the great advances made in medicine during the five years of war. Among these advances were the use of the sulphonamide drugs, penicillin, and mass radiography; work in connexion with typhus control, etc. Epidemics which were most to be feared so far as Europe was concerned were those of typhus fever—which killed about 5,000,000 people at the end of the last war—and malaria. Before the war there was a very effective system of notifying major epidemic disease from every country in the world. This information covered about 90% of the world's population. The reconstitution of this inter-Government information service would be one of the most urgent pieces of post-war work.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 18.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included) (1) London (administrative county) (c) Scotland. (d) *Eire*. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London) (b) London (administrative county). (c) The 13 principal towns in *Eire*. (d) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	87	7	22	6	1	95	7	30	2	11
Deaths .. ..	2	2	—	—	—	3	3	—	—	—
Diphtheria .. ..	688	33	187	83	39	798	44	180	100	28
Deaths .. ..	10	1	—	—	—	15	1	3	1	—
Dysentery .. ..	269	37	117	1	—	66	8	26	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	4	—	—	—	—	2	—	—	—	—
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	52	3	2	—	—	53	5	5
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	52	14	11	21	2	59	12	6	16	4
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Measles .. ..	2,226	286	345	296	2	19,409	1,152	638	8	78
Deaths .. ..	3	1	—	3	—	41	5	1	1	1
Ophthalmia neonatorum .. ..	85	5	16	—	1	103	6	22	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	5	—	—	—	—	8	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,284	86	19	18	5	1,304	75	9	12	12
Deaths (from influenza) .. ..	51	7	3	1	1	52	5	2	1	2
Pneumonia, primary .. ..	—	—	330	32	14	—	—	328	28	17
Deaths .. ..	80	—	18	—	—	48	—	13	—	—
Polio-encephalitis, acute .. ..	—	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polymyositis, acute .. ..	6	—	1	—	—	3	—	2	3	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	3	13	—	—	—	4	29	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	166	7	11	—	4	173	9	23	2	3
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,395	152	247	22	85	2,160	165	288	48	56
Deaths .. ..	2	—	—	—	—	3	—	—	—	—
Smallpox .. ..	3	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	6	2	1	1	7	13	—	6	14	3
Deaths .. ..	1	—	—	—	—	1	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,026	206	139	34	18	2,077	191	253	29	20
Deaths .. ..	7	1	1	2	2	13	6	1	4	1
Deaths (0-1 year) .. ..	433	65	72	47	31	434	60	79	43	42
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	5,793	1,009	698	262	161	5,395	816	666	259	159
Annual death rate (per 1,000 persons living) .. ..	—	—	16.0	17.1	—	—	—	15.0	17.0	—
Live births .. ..	7,342	906	915	473	341	6,425	758	934	345	290
Annual rate per 1,000 persons living .. ..	—	—	18.6	30.9	—	—	—	19.1	22.7	—
Stillbirths .. ..	216	31	40	—	—	216	38	40	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	4.2	—	—	—	—	4.1	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and *Eire*.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

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### ANY QUESTIONS?

#### Achlorhydria

**Q.**—What diet do you recommend for achlorhydria? The patient is unable to tolerate hydrochloric acid.

**A.**—Achlorhydria in itself requires no treatment. It is present without symptoms in a large proportion of the population, particularly in the later age groups. If achlorhydria is found in the investigation of a case of dyspepsia it is unlikely that the symptoms are due to lack of HCl or pepsin. The achlorhydria may well be a pure coincidence. On the other hand, achlorhydria may be associated with an active gastritis, and treatment should be directed to that. In pernicious anaemia the dyspepsia is usually relieved by liver treatment, and if it persists cholecystitis or gall-stones should be suspected. The association of achlorhydria with carcinoma of the stomach should be borne in mind. If a diagnosis of achlorhydric gastritis is made, the diet should be adequate in all essentials, digestible, and mechanically non-irritating. Meals should be small and rather dry and intermediate feeds may be taken. In fact, the ordinary Sippy diet for gastric ulcer will serve well with very slight modification. The main difference is that gastric stimulants such as meat extracts, soup, beef tea, marmite, etc., are to be encouraged. Fruit juices are also favoured by some dietitians. As achlorhydria occurs in vitamin-B deficiency it may be well to pay special attention to foods rich in vitamin B, such as liver, oatmeal, beans and peas, and wholemeal bread. So long as the food is properly cooked and served there is no reason why any of these should produce dyspepsia. The main use of hydrochloric acid is in the treatment of diarrhoea associated with achlorhydria, and, if it is not well tolerated, betaine hydrochloride can be tried in a dosage of  $7\frac{1}{2}$  to 15 gr. in water after meals.

#### Life of Ova and Spermatozoa

**Q.**—Taking the menstrual cycle as starting from the termination of the last period, and presuming the latter to last 5 days, when is the day of ovulation in (a) a regular cycle of 28 days, and (b) an irregular cycle? What is the duration of life of mobile spermatozoa (a) deposited in the vaginal tract, (b) which find their way to the uterus or Fallopian tubes? What is the duration of life of the ovum?

**A.**—Permanent loss of motility is assumed to indicate death of spermatozoa, and, although this may not be true, it is a useful practical criterion. But long before it ceases to be motile a spermatozoon loses its power to fertilize an ovum, and it is presumably the duration of this characteristic which is in question. This is obviously difficult to determine, especially in the human species, and an unequivocal statement is not possible, particularly as spermatozoa

obviously vary in their inherent viability and the conditions in the female genital tract are not constant (e.g., pH). In the human being sperms retain their motility in the vagina for  $1\frac{1}{2}$  to 3 hours only, usually not longer than 2 hours. Their ability to fertilize is lost in a shorter time, and, according to some authorities, within a few minutes. In the cervical canal, uterine cavity, and Fallopian tubes motility is preserved for 4 to 5 days or slightly longer; former statements of 21 days are no longer accepted. Again the power to fertilize is retained for a shorter period; the exact time is unknown, but it is probably about 24 hours or, at the most, 48 hours.

The life of the ovum is also short, and after 24 hours (possibly less) it is no longer capable of being fertilized. Ovulation occurs more constantly in relation to the next period than to the last, and usually  $14 \pm 1$  days before the onset of menstruation. For a regular cycle of 28 days this means  $14 \pm 1$  days from the onset of the last period—the count should not be made from the last day of menstruation. When the cycle is so irregular that the onset of the next period cannot be predicted, the time of ovulation cannot be calculated.

#### High Birth Weights

**Q.**—What is the greatest known live birth weight? I (Gold Cow, W. Africa) have just delivered triplets of 4 lb. 10 oz., 6 lb., and 6 lb. 4 oz., total 16 lb. 14 oz. All were males, monoovular twins and tertium quid. The singleton was the smallest, and his placenta showed an organized clot with M.T. malarial parasites in a smear.

**A.**—A single foetus weighing more than 11 lb. is very rare. Abnormally large babies are often borne by abnormally large women. Statistics concerning large babies do not always distinguish between live and still-births. Williams says that of 25,000 babies born under his supervision the heaviest weighed 14½ lb. Moss (*British Medical Journal*, 1922, 2, 643) recorded the delivery of a foetus (stillborn after difficult forceps extraction weighing no less than 24 lb. 2 oz.). This foetus was later shown at the Royal Society of Medicine, and reweighing (after a long period in fixative) recorded more than 23 lb. The combined weight of twins or triplets is often relatively high. The composite weight of the famous Dionne quintuplets five days after birth was 11½ lb. I have knowledge of one case of twins in which the babies weighed 8 lb. 1½ oz. and 7 lb. 3½ oz. respectively (total weight 15 lb. 5 oz.). These children were born alive and survived.

#### Coronary Thrombosis

**Q.**—Lately I have had to deal with an unusual number of cases of coronary thrombosis. What immediate treatment is likely to save life? Why do nitrites give relief in cases of angina pectoris and not in cases of coronary thrombosis in view of the fact that in both conditions lesions of the coronary arteries are frequently present post mortem?

**A.**—Nothing is so important in the immediate treatment of a patient with coronary thrombosis as complete immobilization. If up and not too ill to move, he should go to bed and not get out of it. Morphine subcutaneously gr. 1/4 should be given at once, and repeated in 15 to 30 minutes if required and still again, rather than allow the pain to continue. He should avoid unnecessary arm movements, especially stretching out, and he should not shave, or wash himself. This implies efficient but not too active nursing. The giving of an enema is taking an unnecessary risk. Glucose drinks are suitable. Oxygen should be given by nasal catheter or by spectacle frame if there is cyanosis. Digitalis is contraindicated unless symptoms or signs of cardiac failure appear.

Nitrites relieve angina of effort by dilating the coronary vessels. This action cannot relieve the pain from a thrombosed coronary artery with its consequent infarct. Besides, the general effect of nitrites in lowering blood pressure is a reason against their use in coronary thrombosis, which itself produces a significant fall.

#### Disposal of Foetus

**Q.**—There is often some doubt as to the correct disposal of the foetus in cases of abortion, miscarriage, and premature confinement. What should be the correct advice in the following circumstances: (1) up to 3 months; (2) from 3 to 6 months; (3) from 6 to 7 months where the foetus may show signs of life though not viable; (4) from 7 months to term, where the child (a) is stillborn, (b) lives for a short time but is not christened; (c) ditto, but is christened (in this case should the parents arrange for a burial service in church?)? Arising from this last, at what stage of development should the parents be advised to arrange for the baptism of a child which may show signs of life but is obviously non-viable? Lastly, at what stage of development should the foetus be registered as a stillbirth?

**A.**—The time divisions of the question are not significant. To deal first with stillbirth. A stillborn child is "any child which has issued forth from its mother after the 28th week of pregnancy, and which did not at any time after being completely expelled from its mother breathe or show any other sign of life" (Births and Deaths Registration Act, 1926). The medical practitioner or certified midwife in attendance should issue a certificate of stillbirth to the father or other person entitled to register the birth, but he may only do so if he was present at the birth or if, after examination of the body, he is satisfied that the child was stillborn. He may obtain the forms free from the registrar of the district.

If the period of gestation was less than 23 weeks the stillbirth need not be registered or notified; the practitioner is merely required to give a certificate stating that the child was stillborn. A still-born child may not be buried in any burial ground without a registrar's certificate or a coroner's order.

For the remainder, the crucial question both at law and in religion is whether the child ever had a separate existence—that is, gave signs of life after being completely free from the mother. If it did so, then both its birth and its death must be registered and the medical practitioner in attendance must give a certificate of cause of death; to dispose of the body without doing so is an offence under the 1926 Act. The law does not inquire whether a child has been baptized or not. The practice of both the Roman Catholic Church and the Church of England is to baptize a child that shows

gns of life even if it is not viable. In Roman practice the baptism is conditional. In both communities it may be performed in case of emergency by any adult lay communicant. If a child has been baptized, it is doubtless the parents' moral duty to see that it is baptized with the rites of the Church. If the child has shown signs of life within the first 28 weeks of pregnancy, it has had no existence at law and may be disposed of in any convenient way. If the medical practitioner is in doubt whether the foetus may be acquired as evidence in a criminal investigation, he should arrange for its preservation until the police have consented to its removal.

#### Urethral Discharge

**Q.**—What might be the cause of a clear urethral discharge in a young married male? Repeated smear tests and blood tests have been negative for gonococci, and the history is not relevant. May *Trichomonas vaginalis* be the underlying cause? What is the treatment?

**A.**—1. Assuming that not only are gonococci absent but pus cells and other pathogenic organisms as well, a clear urethral discharge may be due to a variety of causes, most of which are relatively unimportant. The discharge may consist of mucus or prostatic secretion and may be indicative merely of excessive secretion from the glands lining the urethra or of prostatorrhoea.

2. It is possible but not probable that *Trichomonas vaginalis* is the cause; this can be decided by examination of a fresh specimen with a dark-ground microscope; in any case *Trichomonas vaginalis* is uncommon in the male and still more rarely causes signs and symptoms.

3. The treatment of *Trichomonas vaginalis* infestation consists in rendering the urine strongly alkaline—e.g., by means of large doses of sodium bicarbonate. The organism cannot persist in an alkaline medium. Should all pathological examinations be negative, it is suggested that a trial be given to a simple alkaline diuretic mixture.

4. On the other hand the discharge may indicate an uncurd gonorrhoea or non-gonococcal urethritis; these can be excluded only by careful clinical examination, including urethroscopy and examination of the expressed secretion of Cowper's glands and prostatic and seminal vesicles.

Should examination of the patient reveal anything pathological, examination of the wife is indicated.

#### Sycosis Barbae

**Q.**—I should be grateful for your views on the treatment of sycosis.

**A.**—If by sycosis is meant a deep staphylococcal infection of the hair (beard and/or moustache), then treatment relies on the mechanical removal of the infected (and other) hairs by forceps, or by x-ray depilation under expert supervision. Local antiseptics are mostly without value because they cannot penetrate and reach the deeply placed focus. An exception to this is found in the benzoyl peroxide and clinolol compound ointment, which should be well rubbed in night and morning. It will be interesting to know if penicillin proves effective.

#### Pediculosis Pubis

**Q.**—Is there any method of treating pediculosis pubis without shaving or the use of irritating substances?

**A.**—The following procedure advocated by H. W. Barber satisfies all the requirements. A pad of lint soaked in 1/40 solution of carbolic acid is applied for one hour. This removes and kills parasites and ova. As a precaution a weak ammoniated mercury ointment is thereafter applied for a few days in case some ova have escaped destruction.

## INCOME TAX

#### Purchase of Practice

"J. L." has taken over the practice of a deceased practitioner. Should his assessment be based on the first year of his "new" practice or on his earnings in the last year of his previous practice?

\* The former—i.e., the practice is treated as "new" as from the date of purchase.

#### Prisoner of War

"A. E." was a prisoner of war from June, 1942, until June, 1943. He received a portion of his pay in Italy (in lire), plus a further payment representing the pay of an Italian officer of similar rank in view of work done as a medical officer. The cost of living in Italy was extremely high, but had to be incurred to ensure ability to perform the work. A claim has been made to deduct a part of such expenses as being incurred "wholly, necessarily, and exclusively in pursuit of the employment," but the claim has been rejected.

\* The Courts have maintained a rigid attitude towards claims to regard ordinary living expenses as providing a foundation for an income-tax allowance. Costs of living differ as between different

parts of the United Kingdom, and a salary paid for service abroad—if assessable at all—is assessable in full, notwithstanding high local costs of living. We cannot advise our correspondent to appeal against the decision.

#### Assistant: Commencement of Liability

"C. F." started professional work in Nov., 1942. He has been assessed simultaneously for the five months to April, 1943, and for the year to April, 1944. Deductions of tax started in Nov., 1943. Is this correct?

\* Yes. The preceding year basis does not apply to the first year's earnings, whether those earnings result from employment or otherwise.

#### Assistant Paid Weekly

"C. J." is an assistant in general practice paid weekly.

\* He will come under the new "pay-as-you-earn" system as regards payments made to him after April 5, 1944. As he is not a manual wage-earner the "discharge" of the tax assessable for 1943-4 will be on the basis of 7/12ths and not 10/12ths.

#### Cash Basis: Partner in the Forces

"B. H."—The terms of the partnership deed provide for the bringing into the profits of the practice the Services pay and allowances of a partner serving in the Forces. The inspector of taxes insists on treating this income as assessable separately under Schedule E, and declines to include it as part of the profits assessable under Schedule D on the firm.

\* The arrangement under which the earnings derived from appointments, etc., are included in the Schedule D assessment is ultra-legal, and rests on a concession of long standing. The Inland Revenue authorities, however, have not so far as we know extended it to cover the case of a partner's Service pay, and we do not think that the concession is likely to be extended in that way.

#### Employment after Demobilization

"R. R." was invalided out of the Forces in Oct., 1943. He did eight weeks' locum work and joined the E.M.S. in Jan., 1944. His earnings in 1943-4 will amount to £467 10s., and he pays £84 in life assurance premiums.

\* He can claim medical subscriptions and car expenses, etc., while on locum work, and may be entitled to a proportion of the uniform allowance for the period in the Forces. The tax chargeable for 1943-4 is apparently in the region of £45.

#### Sale of Practice

"J. M." sold the "goodwill only" of his practice. The inspector of taxes wants to know how much he received for the sale of the practice. Is he entitled to demand this information?

\* No. In any case the inspector has no statutory authority to ask such questions, but does so by long-standing practice to avoid passing the matter on to the District Commissioners (who are entitled to call for evidence) to settle an appeal. This question is apparently directed to ascertaining whether the price received for the goodwill is consistent with the returns made in past years—at least no other reason for it occurs to us—and though there may be no special reason for refusing the information our correspondent is entitled to do so unless and until required by the Commissioners to supply it.

#### Car Temporarily Laid up

"D. H." normally keeps a car for professional work, but in present conditions has laid it up in a rented garage and uses a motor-cycle. The inspector of taxes has refused to allow the cost of insuring and garaging the car because it is unlicensed.

\* In our opinion the inspector's attitude is wrong and would not be supported by the authorities. We advise "D. H." to put the facts in writing to the Chief Inspector of Taxes, Somerset House, London, W.C.2.

#### "Pay as you Earn": Locumtenent

"C. H." asks whether under the new arrangements he will have to deduct tax on paying a locumtenent.

\* We think it must be admitted that in strict law a locumtenent is receiving emoluments assessable under Schedule E, and that legally therefore the new arrangements apply. But the position of a locumtenent is peculiar in that it involves such frequent changes of "employer," and in the past that has been recognized by the authorities and the inconvenience which would result from applying a deduction system in such circumstances has been avoided by regarding locumtenents as within Schedule D and dealing with them accordingly. We do not know, but assume that the same course will be followed under the new arrangements. A practitioner employing a locumtenent would be well advised to consult his inspector of taxes on the point.



## LETTERS, NOTES, ETC.

## Mastoiditis

Mr. G. GORDON MOWAT, F.R.C.S.Ed. (Bolton) writes: I have no doubt that Dr. H. Hilton Brown (March 18, p. 412) writes in good faith, but I cannot allow to go unchallenged his statement that "mastoiditis is not present in the vast majority of cases operated upon." During the present war I have examined many hundreds of cases referred to me on account of chronic discharge from the ears. Most of these are debarred from military service. I think any otologist will agree with me that if these cases had been properly operated upon within six weeks of the discharge commencing they would to-day have a healed drum and normal hearing. Almost any case of mastoiditis will subside without operative treatment, but, nevertheless, infection of the mastoid is present, and the ears continue to discharge.

## Polished Rice and Beriberi

Dr. J. LEASK (Ferndown, Dorset) writes: One hears daily of the sufferings from beriberi of our prisoners of war in Japanese hands. I wonder if they could be advised, say, through the medium of the Red Cross, to expose their rice to the sun for a day before cooking. About 40 years ago, when I was in medical charge of H.M. Prison, Singapore, beriberi was rife among the inmates. They were having polished rice in the diet. With the idea of giving them sea air and removal from a possible source of infection a batch of prisoners were transferred to an island in the harbour, where they received precisely similar food to that given in the prison and from the same source. The result was remarkable; no fresh cases occurred on the island and all improved in health. The only difference was that their rice was spread out on mats and exposed to the sun during the day before being cooked. The rice thus irradiated seems to have regained some of its vitamins, for in the light of subsequent discoveries the marked improvement in the cases on the island must have been mainly due to the irradiated rice. Unfortunately all my papers were destroyed by enemy action, so I am unable to give figures, dates, or other details, having to rely on memory only.

## A New Test for Acetone

Mr. JOHN INGRAM, F.I.C., biochemist to the Medical Unit, Welsh National School of Medicine, Cardiff, writes: Rothera's test is a satisfactory one for ketosis. It is essential to perform this test in a room that is not used for blood and water analysis, otherwise contamination of the reagents will occur and inaccuracies will result. The new test for acetone bodies is carried out on a dry stable powder, containing sodium carbonate, ammonium sulphate, and sodium nitroprusside. The powder detects the presence or absence of acetone in the urine. The colour reaction is identical to that found in Rothera's test, a delicate permanganate tinge develops, which gradually deepens within two minutes if acetone is present. There are no fallacies and the powder will detect acetone in a dilution, 1 part in 10,000 parts of urine. Reagents are prepared thus: 3 g. of sodium nitroprusside is ground to a powder in a mortar, add 100 g. ammonium sulphate and 50 g. of sodium carbonate anhydrous, mix well in the mortar; keep in a dry wide-mouthed bottle. *Method as Applied to Urine.*—Place a small amount of the powder in a dry test-tube (about half an inch). Saturate the powder with a small amount of urine. If acetone is present, the powder will develop a faint permanganate colour to a deep permanganate colour for larger amounts within two minutes. A brown colour does not constitute a positive reaction. By the use of this powder in clinical laboratory practice the performance of the test is simplicity itself and the cost is almost negligible. The test so performed is thoroughly reliable and very sensitive. It does away with objectionable ammonia.

## Quinine Sulphate for Intramuscular Injections

Drs CHRISTIE MCGUIRE, M. L. CHAKRAVARTY, and G. C. KARMAKAR write from Dooars, Bengal: Owing to the shortage of quinine bihydrochloride we have been using quinine sulphate for intramuscular injections, and our results have been so satisfactory that we desire to bring it to the notice of your readers. During the past 12 months we have given about 6,000 injections and to date we have not had any abscess formation. Some of our patients include infants a month old. We have found that the local tenderness at the site of the injection, which is usually given in the buttocks, and the therapeutic results are similar in all respects to quinine bihydrochloride. Our method of preparation is as follows: (1) Add 100 minims of dilute hydrochloric acid to 10 c.c.m. of distilled water and dissolve 100 grains of quinine sulphate in the solution. Then add enough distilled water to make the total quantity 20 c.c.m. (2) Filter through filter paper. To prevent the solution from being absorbed into the paper first moisten the paper with distilled water. After filtering boil and keep in a sterile stoppered bottle. The solution is now ready for use. Each 1 c.c.m. contains 5 grains of quinine sulphate and the usual adult dose is

2 c.c.m. If the solution is not all used the same day and there is any doubt about sterility, the remaining quantity can be boiled again before use. In our experience the efficacy of the quinine is not affected by double boiling. (3) Don't use dilute sulphuric acid for dissolving the quinine sulphate as we have found that after while the quinine crystallizes to the bottom, but this does not occur with dilute hydrochloric acid.

## Treatment of Pregnancy Vomiting

Dr. W. EDWARDS (Ashted) writes: The vomiting of pregnancy seemed to me so similar to the vomiting induced in some people by synthetic oestrogens that I wondered if the large volume of oestrogens present in the blood in pregnancy might be responsible for the sickness in susceptible women. Whether or not that is so I have now treated a dozen cases of vomiting, severe enough to make life a misery, by giving a synthetic progesterone in the hope that it might balance things up. I have used "ethisterone" (Boots), one tablet of 10 mg. daily; and every one of these dozen cases cleared up completely in a week and in none did the vomiting recur. It may have been suggestion, or luck, but it would be interesting to know if anyone can confirm these results.

## Pin-hole Urinary Meatus

Dr. HENRY A. LAVELLE (Derby) writes: In your issue of Feb. 26 (p. 314) there is a question under the heading "Pin-hole Urinary Meatus." The condition described in the question is not due to the embryological cause given in the answer. It might be as well if the facts were stated. Some children pass a urine which soon becomes very ammoniacal. This gives rise to a napkin rash with blisters which ulcerate in bad cases. If this type of child is circumcised the meatus, protected up to now, frequently becomes the site of a more or less chronic ulcer. This, by scarring, causes the narrowing. Enuresis, with more prolonged contact with the urine, obviously is a contributory cause when present. Enuresis may also be due in some cases to the ulceration, as the child, when awake, avoids micturition, as it hurts. This pin-hole urinary meatus is the one important bad effect of circumcision. The treatment is to treat the cause, with a meatotomy later if necessary. Prevention is better than cure.

## Hyperidrosis: Pruritus

Dr. N. S. FINZI writes: Two of the answers in "Any Questions?" are at variance with radiological experience: (1) *Excessive sweating.*—These cases do extremely well with correct x-ray treatment, and I have had no trouble at all, or any failures so far, though some of my cases I have seen more than twenty years after the treatment. I have, however, seen a case of gross damage, but it was not treated by a radiotherapist. A single treatment is usually sufficient. (2) *Pruritus ani et vulvae.*—X-ray treatment in small doses (about 60 r. a week) will very often completely relieve these patients, though it occasionally fails, especially in the type associated with leucoplakia. Underlying causes must of course be eliminated.

## Salt Drink for Cramp

Dr. H. A. DIRCKZE (Wellawatte, Ceylon) writes: I was interested to read two notes on a remedy for cramp on page 402 of the *Journal* of March 27. As a public health officer I have for many years been in charge of ante-natal clinics. A frequent complaint by expectant mothers is that they suffer from nocturnal cramp, especially of the calf muscles. I advise them to drink a glass of water in which half a teaspoonful of common salt is dissolved. One such glass is drunk just before retiring and one is ready by the bed should the cramp come on in spite of the glass already drunk. It has invariably been successful. On one occasion at a tennis tournament a friend of mine who was in the running for the finals developed cramp during a set. He was quite disappointed as he knew from past experience that he would not be able to resume play. I hastily obtained some common salt and dissolved half a teaspoonful in a glass of sweetened lime juice and made him drink it. In a few minutes the cramp disappeared. I gave him another glass of the mixture and he was able to resume his game without recurrence of the cramp. I should mention that the idea came to me because during the D.P.H. course at the London School of Hygiene we were told that the "bends" or severe cramps suffered by stokers on board ship have now been entirely eliminated by giving them normal saline to drink instead of plain water. It was stated that the loss of salt during sweating for some unknown reason (perhaps not known to me only!) causes cramps in some subjects. I, too, had cured myself in a minute or so of an attack of nocturnal cramp by hastily preparing and quaffing a glass of (more or less) normal saline.

## An Answer Corrected

The contributor regrets that his reply to the question on congenital deafness (April 1, p. 481, under the "Any Questions?" section) contains a serious error. The patient is certainly a carrier. This, however, does not affect the opinion given as to marriage.

# BRITISH MEDICAL JOURNAL

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## AN INVESTIGATION OF THE THERAPEUTIC PROPERTIES OF PENICILLIN A REPORT TO THE MEDICAL RESEARCH COUNCIL

BY

J. N. BARRON

R. V. CHRISTIE

D. B. FRASER

L. P. GARROD

O. T. MANSFIELD

H. V. MORGAN

R. MOWLEM

I. M. ROBERTSON

A. C. ROXBURGH

I. A. ROXBURGH

### A REVIEW OF THE WORK OF A PENICILLIN THERAPEUTIC RESEARCH UNIT

BY

RONALD V. CHRISTIE, M.D., D.Sc., F.R.C.P.  
Professor of Medicine

AND

L. P. GARROD, M.D., F.R.C.P.  
Professor of Bacteriology, St. Bartholomew's Hospital

It is now common knowledge that the discovery of penicillin by Fleming (1929) and its extraction in more concentrated form by Chain and Florey were followed by clinical trials in Oxford by Florey and his collaborators, from which it became clear that penicillin is a therapeutic agent of a new type and extraordinary powers (Chain *et al.*, 1940; Abraham *et al.*, 1941; Florey and Florey, 1943). When further, although very limited, supplies of penicillin became available from commercial sources the Medical Research Council was entrusted with its distribution for extended therapeutic study. The Council's Penicillin Clinical Trials Committee, established in March, 1943, allocated supplies to four main centres, as well as to a number of other institutions where smaller quantities were used for specific purposes. This and succeeding papers constitute a report from one of these centres on work which has now been in progress for rather less than a year.

At this stage the foundations of penicillin therapeutics had already been well laid by the Oxford workers, and the following is a short summary of what was known of its properties. Penicillin itself is highly unstable, but its calcium and sodium salts are relatively stable, and it is in one of these forms that the substance is used therapeutically. All preparations hitherto available have been impure, containing often only a small percentage of true penicillin: dosage is therefore not calculated by weight, but in terms of Oxford units, this being a measure of bacteriostatic power assessed by comparison with a standard product.

Penicillin has three fundamental properties on which its action in the body depends. The first is enormous antiseptic power: even when diluted a millionfold or more it will still completely prevent the growth of certain bacteria. The second is almost complete indifference to the medium in which it acts: other antiseptics with comparable activity in water or broth lose most of this activity when brought into contact with the protein and cellular constituents of body fluids, but penicillin acts as well in serum, blood, or even pus as in broth. Thirdly, it is almost completely non-toxic to the body as a whole, and, so far as is known, to any of its constituent cells: only enormous concentrations, far in excess of those required for action on bacteria, interfere with the activity of leucocytes or any other cells

hitherto studied from this standpoint. These are of course the three properties which have long been postulated, without any serious expectation of ever finding them combined to this degree in one substance, as those of the ideal antiseptic.

It is of the first importance to recognize that this action is exerted only against certain bacteria; others are highly resistant to it, and penicillin has for years been used by Fleming (1932) as a constituent of selective culture media. Susceptible bacteria are almost all Gram-positive, the chief exceptions to this rule being the gonococcus and meningococcus. The most important of the susceptible Gram-positive species are the three main pyogenic Gram-positive cocci—*Staphylococcus aureus*, *Streptococcus pyogenes*, and *Pneumococcus*—and it is noteworthy that whereas staphylococcal infections are far more resistant than haemolytic streptococcal infections to sulphonamides, they are almost equally susceptible to penicillin treatment. The gangrene group (including *Cl. oedematis*, which is relatively sulphonamide-resistant), *B. anthracis*, *C. diphtheriae*, some strains of *Strep. viridans*, and *Actinomyces* have also been found susceptible *in vitro*. More or less resistant species include almost all Gram-negative bacilli—the typhoid-dysentery group and coliforms generally, *Proteus*, *Ps. pyocyanea*, the genera *Haemophilus* and *Brucella*, and *Strep. faecalis* and *Mycobacterium tuberculosis*.

#### Systemic or Local Treatment

Penicillin injected intravenously or intramuscularly circulates in the blood and thus reaches every part of the body, but, owing to the rapidity of renal excretion, heavy dosage is necessary to maintain an adequate concentration. This method of administration is obviously necessary in septicaemia, and has been found so in some local but extensive or inaccessible infections. The dose required for an adult is about 120,000 units daily, and treatment may have to be continued for a week or longer. Thus a million units or more may be given to a single case, whereas a second method of use—the application of penicillin in some form locally to the lesion—may be fully successful and employ only a few thousand units. Owing to the present imperative need for economy, it is therefore a major rule of penicillin treatment to use local application whenever this will suffice. The technique of local application has much to do with success: many new methods have been devised, and further improvements may yet be achieved.

#### The Choice of Cases for Treatment

The impulse of anyone with penicillin at his disposal for the first time is to use it for treating those conditions in which it most clearly excels every other remedy, and particularly for saving life. *Staphylococcal* septicaemia, and septicaemia or meningitis due to a sulphonamide-resistant *Strep. pyogenes* or pneumococcus, are probably the foremost conditions in which penicillin may alone be capable of saving life, and these were among the subjects of therapeutic study approved by the Penicillin Clinical Trials Committee at its first meeting. It soon became evident that the supplies available were quite inadequate

for treating all such cases referred to us, and it has now been decided that cases of staphylococcal septicaemia will not be accepted for treatment. It is one thing to use penicillin to the best advantage in accordance with existing knowledge, and quite another to use it in order to expand that knowledge. The second of these objects was clearly the purpose of our work, and cases are therefore being accepted only if they appear likely to further it. Even were one to resolve to use a limited stock of penicillin for purposes of well-ascertained value, the choice of cases involves decisions of the most difficult kind. As Florey and Williams (1944) have recently shown, 500,000 units of penicillin suffice for the local treatment of over 100 cases of infections of the hand, with an immense gain in rapid restoration of function. The same quantity would cure five cases of sulphonamide-resistant gonorrhoea, and the demand for this purpose may be insistent if the patients are key Service personnel needed in a forthcoming offensive. (Report to War Office, 1943). On the other hand, this quantity of penicillin would be inadequate for the treatment of a single case of septicaemia.

The policy at this centre, although defined only after our work had been in progress for some time, is at present to explore further the possibilities of local treatment in as many directions as possible, and to confine systemic treatment, as a general rule, to early cases of infection of bone—a difficult field in which further study seems desirable. This policy may be changed if new circumstances appear to require it. We have naturally been influenced by the availability of clinical material on the spot, and the special Orthopaedic, Thoracic, and Facio-maxillary and Plastic Units at Hill End Hospital, where most of this work has been done, have provided many of the cases.

One hundred and ninety-eight patients were treated by the local application of penicillin and 18 by systemic administration. Most of them fell into the following clearly defined groups: skin diseases (75 cases), wounds of the skin and soft tissues (70 cases), breast abscesses (15 cases), infections of the mandible (20 cases), and other infections of bone (34 cases). These various groups are described in the series of articles that follows, written by those who were responsible for the treatment of the patients concerned. A few cases could not be placed in any of these groups, and as in several the results of treatment are of interest, these will be described briefly.

The local application of penicillin to the eye in three cases of iritis gave results which strongly support the suggestion that penicillin may diffuse through the cornea in amounts which are of therapeutic significance. The first was a patient with gonococcal iridocyclitis. He was apparently cured after ten days' treatment, but later relapsed. A further course of treatment lasting five days was again successful, and there has been no further relapse. The second and third cases were of iritis of unknown aetiology, and both were apparently cured within a week. It would be unwise to draw any definite conclusions from so small a series, but in the light of previous experience with this type of infection it seems extremely probable that the results obtained were due to the diffusion of penicillin through the cornea. Three cases of conjunctivitis—two chronic, one acute—were also treated by local application with outstanding success. The observations on iritis were made by our colleague Major Seymour Philips.

In two cases of chronic otitis media instillation of penicillin solution was associated with the disappearance of penicillin-sensitive organisms from the discharge, and apparent clinical improvement. In both, however, the condition relapsed within a day or two of cessation of treatment. In one case of acute bilateral otitis media recovery appeared to be hastened, and was complete after seven days of treatment.

Sixteen patients with acute empyemata were treated by the aspiration of pus and replacement with penicillin solution. One or two intrapleural injections of from 15,000 to 30,000 units were sufficient to sterilize the pus; but to obtain a good functional result subsequent drainage of sterile pus was usually found to be necessary. Details of these cases will be published at a later date by Mr. Tubbs, who is responsible for this part of our investigations.

Seventeen patients were given penicillin by one or other of the systemic routes. Nine of them were cases with bone infection, and these are described in one of the articles which follow. Of the other 8 cases some were treated during the early stages of our investigations, before a clear policy was established of the lines along which research could most profitably be directed. Others were chosen because the prognosis without penicillin appeared to be hopeless, and the trial of new methods of administration was therefore justified. Four were suffering from staphylococcal septicaemia. In all of them the infecting organism was a coagulase-positive *Staph. aureus* which was penicillin-sensitive. The two cases which were first treated were critically ill with multiple abscesses and

yet no leucocytosis. In both adequate bacteriostasis in the blood was maintained by the daily administration of approximately 120 units, and the blood cultures remained negative. Although a total of 2 million units in 23 days was given to the first and 3 million units in 18 days to the second, both patients died. On post-mortem examination both were found to have multiple abscesses which contained living staphylococci. In both a large abscess was present under the muscles of the thigh; in the first case this contained at three pints of pus, and in the second about one pint.

In the third patient, who was also critically ill with staphylococcal septicaemia, systemic administration was combined with energetic local treatment; abscesses in the arm and leg and a suppurative pericarditis were drained and penicillin solution instilled. The patient made a complete recovery.

The fourth case of staphylococcal septicaemia had various transitory signs which suggested cerebral abscess, though localization of it was not possible. He appeared to respond well to systemic treatment, which cured the septicaemia, but definite localizing signs subsequently appeared, and a subdural abscess and a cerebral abscess were successfully drained. Both abscesses contained *Staph. aureus*.

Thus of 4 cases of staphylococcal septicaemia 2 were fatal. Our lesson to be learned from the two fatal cases is that penicillin does not replace surgical drainage, and when pus forms in any quantity it must be evacuated. They may be interpreted in a more general way as indicating that penicillin cannot be expected to save even a case of staphylococcal septicaemia; we believe that the 100% recovery rate reported by Florey and Florey (1943) is more than will usually be achieved. To judge by other reports, the prognosis can be affected adversely in several ways: the development of endocarditis, which was found post mortem in one of these cases, is a particularly unfavourable feature.

The fifth case was one of bilateral sulphonamide-resistant streptococcal pneumonia of six weeks' duration. The outlook appeared to be hopeless, but the patient recovered after 750,000 units of penicillin had been given by the intravenous route.

The sixth case was one of actinomycosis of the chest wall and lung. The sensitivity of the organism was about one-fourth of that of the standard Oxford staphylococcus. 700,000 units of penicillin were given over a period of seven days. The patient died at the end of this period from *Ps. pyocyanea* septicaemia and pyaemia (The source of infection was the intravenous drip.) Necropsy showed extensive pulmonary actinomycosis. The fungus colony in section stained poorly and appeared to be disintegrating. This may have been the effect of treatment.

The seventh case was that of an infant with staphylococcal peritonitis and perinephric abscess. The outlook appeared quite hopeless, and a drip containing penicillin was given into the marrow of the tibia. The patient died, and a post-mortem examination showed no evidence of damage to the marrow at the site of injection.

The eighth patient was a child with pneumococcal meningitis associated with bilateral infection of the mastoids, which had been drained. 800,000 units of penicillin were given systemically and 30,000 units by cisternal, ventricular, or lumbar puncture. There has now been no evidence of infection for two months, but the child remains semi-comatose, and it seems likely that, although penicillin has affected a "cure," there has been permanent damage to the brain. We understand that others have had similar experiences in the treatment of meningitis with penicillin. The rapidity with which penicillin may pass from the cisterna magna to the ventricles of the brain was well illustrated in this patient: one and a half hours after 5,000 units had been introduced by cisternal puncture the ventricular fluid inhibited the growth of the standard staphylococcus in a dilution of 1 in 40.

The cases which have been described form a small and relatively unimportant part of the work of our centre. Much more was learned from the series of carefully chosen cases which are described in the articles which follow.

The penicillin used throughout these investigations was supplied by the Therapeutic Research Corporation through the Medical Research Council and Ministry of Supply.

We wish to express our indebtedness to Prof. H. W. Florey and his colleagues at Oxford, who at the outset of the work of the Penicillin Clinical Trials Committee placed their unique experience at our disposal and thus enabled these studies to be begun.

#### REFERENCES

- Abraham, E. P., Gardner, A. D., Chain, E., Heatley, N. G., Fletcher, C. M., Jennings, M. A., and Florey, H. W. (1941). *Lancet*, 2, 177.  
Chain, E., Florey, H. W., Gardner, A. D., Heatley, N. G., Jennings, M. A., Orr-Ewing, J., and Sanders, A. G. (1940). *Ibid.*, 2, 226.  
Fleming, A. (1929). *Brit. J. exp. Path.*, 10, 226.  
— (1932). *J. Path. Bact.*, 35, 831.  
Florey, M. E., and Florey, H. W. (1943). *Lancet*, 1, 387.  
— and Williams, R. E. O. (1944). *Ibid.*, 1, 73.  
Report to War Office and Medical Research Council concerning Use of Penicillin in War Wounds, War Office (A.M.D. 7), 1943. (For summaries see *Lancet*, 1943, 2, 742, and *British Medical Journal*, 1943, 2, 755.)

## EXPERIENCES IN THE SYSTEMIC ADMINISTRATION OF PENICILLIN

BY

H. V. MORGAN, M.B., B.Ch., M.R.C.P.

RONALD V. CHRISTIE, M.D., D.Sc., F.R.C.P.

AND

I. A. ROXBURGH, M.B., B.Ch.

Systemic treatment depends for its success upon the maintenance of an adequate concentration of penicillin in the blood stream. This may be achieved by either continuous drip transfusion or intermittent injection. Neither of these is wholly satisfactory.

## Continuous Intravenous Drip Transfusion

30,000 units of sodium penicillin were dissolved in 1 pint of fluid; transfusion of this amount in 6 hours was considered a suitable initial rate for adults. This dose of penicillin was reduced in the case of younger patients, and subsequent dosage was controlled by blood-titre estimations. The fluid intake was regulated according to the patient's needs. Penicillin was usually dissolved in 4% dextrose in 0.18% saline, but was sometimes added to blood for transfusion. The standard practice was to expose the vein and insert a cannula. A needle was used where it was likely that treatment would be of short duration.

Details of the cases treated by this method are given in Table I. The word "thrombosis" in the table refers to cases in which the drip stopped without rise of temperature or

regarded as an indication for stopping the transfusion without delay. Though impurity of the penicillin probably was largely responsible for this complication, the evidence in Table I does not incriminate any particular batch. The condition generally subsided very rapidly when the transfusion was discontinued, but one case (H. R., who was suffering from extensive thoracic actinomycosis) died of a septicaemia due to *Ps. pyocyanea*, with the primary focus of infection at the site of the transfusion.

Impairment of renal function may lead to retention of penicillin in the blood, so that an adequate concentration may be maintained with much smaller doses (Rammelkamp and Keefer, 1943). This was illustrated by the following estimations of blood titre made in the case of a woman (Case N. M. 3) whose urine contained many red blood cells and granular casts and in whom the blood urea was 56 mg. per 100 c.cm. She had been receiving 30,000 units by intravenous drip transfusion six-hourly. Administration was stopped at 8.15 a.m. and blood removed at intervals subsequently:

Time	Dilution of Serum producing Complete Bacteriostasis	Dilution of Serum producing Partial Bacteriostasis
8.15 a.m.	1 in 32	1 in 64
9.45	1 in 32	1 in 64
11.15	1 in 8	1 in 16
12.45 p.m.	1 in 4	1 in 8
2.15	1 in 4	1 in 8
3.45	1 in 4	1 in 8
5.15	1 in 4	1 in 8
6.45	1 in 4	1 in 8

A specimen taken at 9.45 p.m. showed no bacteriostasis in any dilution.

TABLE I.—Administration by Intravenous Drip Transfusion

Case	Age	Character of Veins	Batch	Units Given	Medium	Method	Site	Duration in Hours	Reason for Stopping
S.H.	44	Good	TRC1	603,000	N. saline	Cannula	L. ankle	72	Adequate dose given
N.M. (1)	27	"	TRC3M	180,000	Dextrose-saline	"	R. ankle	24	Thrombosis
N.M. (2)	27	"	"	1,095,000	Dextrose-saline, dextrose, blood	"	L. ankle	192	"
N.M. (3)	27	"	"	782,250	Blood, dextrose-saline	"	L. forearm	173	Death
N.W. (1)	31	Moderate	"	403,750	N. saline, dextrose-saline, dextrose	"	R. ankle	80	Thrombosis
N.W. (2)	31	"	"	405,000	Dextrose	"	L. ankle	79	"
N.W. (3)	31	"	"	135,000	Dextrose-saline	"	L. forearm	27	"
K.P. (1)	12	Good	R1	237,000	"	"	L. ankle	48	Thrombophlebitis
K.P. (2)	12	"	"	84,000	"	"	L. arm	16	"
K.P. (3)	12	"	TRC3M	278,000	"	"	R. arm	63	"
K.P. (4)	12	"	"	80,000	"	"	L. arm	18	Thrombosis
E.D. (1)	25	"	"	232,500	"	Cannula	L. ankle	48	Thrombophlebitis
E.D. (2)	25	"	"	510,000	"	"	R. ankle	112	"
P.B. (1)	10	"	"	375,000	"	"	R. forearm	158	"
P.B. (2)	10	"	"	364,000	"	"	L. forearm	145	"
J.P. (1)	38	Moderate	TRC8	710,000	"	"	L. ankle	142	"
J.P. (2)	38	"	"	357,000	"	"	L. forearm	72	Adequate dose given
F.S.	42	"	"	496,250	"	"	R. ankle	100	Thrombophlebitis
H.R.	51	Good	R1, TRC3M	733,750	"	"	R. ankle	146	"
P.R. (1)	14	"	TRC10	57,500	"	"	L. ankle	23	Pulled out
P.R. (2)	14	"	"	207,500	"	"	L. forearm	91	Thrombophlebitis
E.W.	58	Poor	TRC10, TRC12a, TRC10	571,670	"	"	L. forearm	126	"
J.B. (1)	14	Good	"	267,300	Blood, dextrose-saline	"	L. elbow	100	"
J.B. (2)	14	"	"	40,000	Dextrose-saline	Needle	R. elbow	14	Adequate dose given
R.P. (1)	12	"	"	277,500	Dextrose-saline, blood	"	L. elbow	84	Thrombosis
R.P. (2)	12	"	"	7,500	Dextrose-saline	"	R. elbow	3	"

TABLE II.—Administration by Intramuscular Injection

Case	Age	Character of Muscles	Batch	Units Given	Duration in Days	Vol. of Inj. in c.cm.	Reaction of Patient	Local Inflammation
S.H.	44	Fair	TRC1	1,323,400	20	10, 2.5	Well tolerated	Slight
N.W. (1)	31	"	TRC3M	605,000	3	10, 5	Strongly objected to	Marked
N.W. (2)	31	Poor	"	900,000	11	"	"	"
K.P.	12	Poor	TRC3M, R1	352,000	8	5, 4	"	Slight
J.P.	38	Good	TRC8	375,000	4	5	Strongly objected to; further injections refused	Marked
F.S.	42	"	"	900,000	7	5	Well tolerated	"
H.R.	51	Fair	TRC10	105,000	3	2.5	Tolerated (comalose)	Absent
J.H.	20	Poor	"	740,000	11	7	"	Slight
D.V.	24	Good	"	1,180,000	11	2.5	Well tolerated	"
P.R.	14	Poor	"	232,500	5	1.5	Objected to	"
E.W.	55	Fair	"	502,500	8	2	Strongly objected to	"
D.P.	6 wks.	Poor	"	28,000	5	1.5	Well tolerated	Absent

evidence of active inflammation. It will be seen that a number of these transfusions were stopped prematurely, most commonly through the development of thrombophlebitis. This occurred after varying periods, but on an average after about 100 hours. In spite of inflammation extending up the vein, the fluid sometimes continued to drip; thrombophlebitis should, however, be

Calcium penicillin was administered intravenously in one case (E. W.), first as a single injection, and afterwards by continuous drip transfusion for 24 hours. There were no ill effects, no evidence of delayed excretion when compared with a control dose of sodium salt, and no rise in serum calcium level.

The advantages of continuous intravenous transfusions were: (1) continuous maintenance of adequate blood titre; (2) combination with parenteral fluid administration, which was sometimes indicated.

The disadvantages were: (1) frequent and painful thrombophlebitis; (2) the method was expensive of veins, especially when these were cannulated and made useless for future occasions.

#### Intermittent Intramuscular Injection

A dose of 15,000 units 3-hourly was adopted as the standard adult dose. Table II shows a series of courses of these injections. It will be seen that the reactions of the patient, both general and local, varied considerably from case to case. The cases, which are arranged chronologically in the table, show that on the whole the later batches of penicillin were better tolerated. Not only the degree of impurity of the preparation, but also the condition of the patient and the volume of individual injections, appeared to have a bearing on toleration of the method.

The mere dislike of an intramuscular injection of any kind repeated every three hours, day and night, accounted for strong subjective reactions against the method even when inflammation was slight. There was always pain after the injections, even when these were "well tolerated." This lasted for varying periods, and in the severer instances until the next injection. Pyrexia in patients otherwise afebrile was noted in two cases (J.P. and F.S.); the former felt ill and looked ill.

The advantage of this method was its simplicity. The disadvantages were: (1) Pain, especially if injections had to be confined to one site. (2) Disturbance of the patient. The ruthless regularity of a painful injection every three hours was more than several of our patients could bear. (3) The rise and fall in blood titre (perhaps not a disadvantage).

#### Drip Transfusion into Bone Marrow

It was felt that this route should be tried as a possible alternative to the two routes already considered. Five such transfusions were set up, the method described by Tocantins and O'Neill (1941) being used. The details of these are given in Table III. Dextrose-saline was employed in all of them.

TABLE III.—Administration by Drip Transfusion into Bone Marrow

Case	Age	Batch	Units Given	Site	Duration in Hours	Reason for Stopping
J.H.	10	TRC10	46,000	Sternum	9	Blockage
D.P. (1)	6 wks.	"	4,500	L. tibia	9	"
D.P. (2)	6	"	22,500	R. tibia	48	"
D.V.	24	"	30,000	Sternum	2	"
P.R.	14	"	25,000	R. femur (site of infection)	7	Leakage

It was most difficult to run in more than one pint through the sternum. The stoppages at this stage cannot be attributed to the penicillin; rather were they due to difficulties inherent in the method itself. Tibial transfusion was employed on two occasions. The second transfusion, although it lasted 48 hours, could not be made to run at a rate adequate to introduce all of the required dose. There are bound to be difficulties in the systemic treatment of infants; the method therefore was encouraging enough to warrant further trial. Samples of bone marrow from sternum and tibia were examined before and after transfusion, and showed no changes which could be ascribed to penicillin.

In Case P.R., a patient with osteomyelitis of the upper end of the femur, a sternal needle was introduced (at exploratory operation), through a drill-hole, into the medulla of the infected bone. A drip transfusion was subsequently established, using this route, but the fluid leaked back along the track of the needle, and it was therefore discontinued. The needle was left in position and used for four-hourly injections, as a result of which an adequate blood concentration was obtained. Some local pain was felt. The value of this method was doubtful.

#### Continuous Intramuscular Drip Transfusion

In view of the disadvantages of the foregoing methods, and at the suggestion of Dr. Valentine, we employed intramuscular transfusions on 6 occasions. The same dose of penicillin was

used as for the intravenous route. The medium employed in all cases dextrose-saline. It was found that two pints; fluid per 24 hours was a suitable rate of flow, though Billimore and Dunlop (1940) stated that larger amounts of fluid could be given if that be the object of the transfusion. An ordinary intramuscular needle was used with an improvised wire frame for supporting it in position. The results are recorded in Table IV.

TABLE IV.—Administration by Drip Transfusion into Muscle

Case	Age	Batch	Units Given	Pints per 24 Hours	Site	Duration in Hours	Reason for Stopping
P.R.	14	TRC10	408,750	3, 2	Outer side of L. thigh	164	Adequate dose given
J.B. (1)	14	"	35,500	2	"	20	Leakage
J.B. (2)	14	"	518,000	2	"	237	Local abscess
A.S.	19	"	383,000	3, 2	Outer side of R. thigh	80	Pulled out
R.P. (1)	12	"	348,750	2	Outer side of L. thigh	105	Local abscess
R.P. (2)	12	"	135,000	2	Outer side of R. thigh	38	Adequate dose given

It will be observed that all the patients were young. We found that the daily administration of three pints by this route was very apt to cause leakage back along the track of the needle. Restriction of the intake to two pints by transfusion and to three pints by mouth stopped this satisfactorily.

Local abscesses around the site of the needle formed in two cases. Culture of the pus produced a growth of coliform bacilli. In the case of J.B. the blood titre fell so that no detectable penicillin was present; absorption from the abscess cavity was presumably very slight. It should be possible to avoid this undesirable complication by improved methods of anchoring the needle, prevention of any leakage, and removal of the needle at the first signs of any inflammation. Possibly, also, elevation of the limb would help by avoiding stasis; the abscess in R.P. was at the most dependent part of the thigh rather than centred round the needle. These two abscesses had to be opened, but they healed in about three weeks.

The method was almost pain-free, and swelling of the thigh was slight provided the rate of drip was kept constant. Improvements in technique are now being investigated, with encouraging results.

The advantages of the method are: (1) continuous maintenance of adequate blood titre; (2) comparative freedom from pain; (3) availability of numerous sites for transfusion, poor musculature being apparently no bar to the method.

The disadvantages are: (1) tendency to local infection and abscess formation; (2) possibility of having to restrict total fluid intake.

#### Summary

The complications which may arise when penicillin is administered by intramuscular injection and by continuous intravenous and intramuscular drip transfusion are described. Each method has its advantages and disadvantages, and may be the best for any particular case.

It is possible that drip transfusion into the bone marrow of the tibia may be of value in the administration of penicillin to infants.

#### REFERENCES

- Billimore, B. R., and Dunlop, E. E. (1940). *Lancet*, 2, 65.  
 Rammelkamp, C. H., and Keefer, C. S. (1943). *J. clin. Invest.*, 22, 425.  
 Tocantins, L. M., and O'Neill, J. F. (1941). *Surg. Gynec. Obstet.*, 73, 281.

The Universities' Federation for Animal Welfare (UFAW), in response to a demand, has begun the compilation of a handbook on the care and management of the smaller laboratory animals. The secretary is Dr. F. Jean Vinter, 284, Regent's Park Road, Finchley, N.3. Various sections of the book are being drafted by research workers having appropriate special knowledge, but the Federation wishes to supplement the drafts with information derived from a wide range of sources. It is accordingly sending a list of subjects to all licensees under the Cruelty to Animals Act, 1876. Inquiries are invited from non-license-holders, some of whom might help in this undertaking. The work as a whole will be submitted before publication to a small number of eminent men of science.



## SURGERY AND PENICILLIN IN MANDIBULAR INFECTION

BY

RAINSFORD MOWLEM, F.R.C.S.

This series of 21 cases of infection in connexion with bone is too small to justify detailed analysis, but it may help to clarify the part which penicillin can be expected to play. The cases fall into two groups. In the first, infection has been anticipated after surgery. The use of penicillin has been withheld until the presence of sensitive bacteria has been shown. This has been done in an attempt to evaluate the effects of penicillin under conditions of bacteriological control, and has sometimes caused an undesirable delay. The second group comprises cases of well-established bone infection, all of which have been subjected to full bacteriological investigation, and all of which have been treated by radical surgery and penicillin.

One other case is included for the moral it points.

**Case 1331.**—Soldier aged 53. Presented a two-months-old sinus in the iliac crest, with induration of the surrounding tissues. Haemolytic streptococci ++; *Staph. aureus* ++. Penicillin 1,000 units was injected daily for ten days, with improvement in the surrounding soft tissue but no change in the sinus or its bacteriology. At operation a small sequestrum was found in a cavity lined by fibrous tissue, about 3/8 in. thick.

It is not to be expected, in such circumstances, that even if sterility can be obtained it will automatically be followed by healing. The fibrosis and its resultant avascularity are the determining factors, and not the infection, and this will be true of many established bone infections.

### Group I

This consisted of 4 post-operative cases, in all of which infection was either anticipated or was causing early reaction. In all of them immediate bacteriological and clinical control was obtained, and was followed by satisfactory healing.

**Case 1629.**—Soldier aged 31. Sept. 13, 1943: Resection of the left side of the mandible from the canine tooth to the temporomandibular joint, for an infected multilocular cyst of the whole area. Nov. 8: Chip bone grafting for complete restoration, in spite of a persistent sinus into the mouth. A penicillin tube was inserted along the upper margin of the grafts. Nov. 11: Cheek puffiness ended. Fluid withdrawn from the tube shows *Staph. aureus* ++. Penicillin 1,000 units in 1 c.c.m. injected daily. Nov. 15: The local signs of infection had disappeared, and aspirated fluid was sterile. The next day penicillin was discontinued, and recovery was complete.

It is felt that penicillin contributed very materially to a speedy and uncomplicated convalescence.

Two other bone-graft cases—one with exposure to the surface, and the other with a sinus into the mouth—were treated. In the former satisfactory healing was obtained, but in the latter a few chips of the graft were lost, though the greater number survived. This loss may have been due either to the late and inefficient application of penicillin or to inadequate drainage.

In the fourth case most of the right side of the mandible was resected for an odontoma. In spite of drainage the resultant cavity filled with blood clot and on the sixth day swabs showed haemolytic streptococci ++, *Staph. aureus* ++, coliforms +. 6,000 units of penicillin were injected in the next three days, and thereafter penicillin cream (400 units per gramme) was applied to the drainage opening. On the 12th day the wound was dry and healed.

In this series, therefore, the evidence points to early bacterial control with consequent normal healing, and no local deleterious effects have been seen.

### Group II

This comprised 16 cases of osteomyelitis of the mandible. In all of them infection has been gross and well established, and penicillin has been used in conjunction with radical surgery. Since surgery, other than drainage, is not often adopted, it may clarify the position to state the considerations on which it is based.

Osteomyelitis of the mandible is a relatively rare condition which may—especially in children—arise from blood-borne

infection, but which more frequently is preceded by the extraction of teeth. The cause of the former condition is clearly understood, but the latter type is commonly attributed to less well defined factors. "Diminution of local immunity" and "specific organismal infection" have both been suggested. The latter condition appears to be incapable of proof, and it has so far been impossible to recover from the infected mandible any organisms which can be shown to differ from those present in the normal mouth. In this series the following organisms in various combinations have been encountered: haemolytic streptococci and *Staph. aureus*, both aerobic and anaerobic, pneumococci, *Strep. viridans*, *H. influenzae*, coliform bacilli, and a host of lesser Gram-negative organisms. These may all occur in the normal mouth as well as in the infected jaw, and if their presence were the important factor one might expect massive bone infection to follow almost every dental extraction.

"Local low immunity" is meaningless if it envisages a condition in which otherwise normal tissues become incapable of resisting bacterial invasion by reason of some unspecified cellular change. At the same time there must be some factor which determines whether or not a fairly constant type of mouth infection shall invade the bone. It is suggested that this factor is the local vascular system, which is the key to the mobilization of the defence mechanism. If the potent factor is a vascular one, it is further suggested that thrombosis is the primary disaster. This may be caused either by direct trauma to the inferior dental vessels during the removal of a tooth or by the central extension of thrombosis in the vessels supplying either a tooth root or the surface structures. Occlusion of the main vessels will create a large central area of bone of reduced vitality in which the secondary bacterial invasion is incapable of being withstood. It is obvious that the further back along the vessel this thrombosis extends the greater will be the disaster, and clinical findings tend to bear this out. Though thrombosis is often seen at operation, it is almost impossible to say whether it has preceded or followed the infection, but the probability of its being the primary cause is evidenced by the following:

(a) Mandibular bone infection is rare after the extraction of incisor teeth, and in this area it is usually localized. As one goes further back along the tooth-bearing ridge both the probability and the severity of infection increase. This variation would seem to be dependent upon anatomical consideration of the vascular distribution.

(b) The extraction of deciduous teeth is seldom followed by infection, not because of any difference in the bacterial flora of the mouth in early life, but because damage to the inferior dental vessels is unlikely. The roots of children's teeth are not in close approximation to the vessels, and may be separated from them by the up-growing secondary dentition.

(c) Osteomyelitis of the superior maxilla following dental extractions is almost non-existent. The blood supply of this bone is segmental and vertical, and is incapable, in its periphery, of complete occlusion. The bacteriological state of the mouth must just as often be as potentially dangerous as in extractions of the lower teeth, but the probability of infective invasion remains infinitely remote.

Once medullary infection is established it passes through an acute primary phase to become a chronic condition. This is due partly to its enclosed position, but to a greater extent to the density of the surrounding bone. This bone, because of its relative avascularity, is incapable of rapid inflammatory response, and is often extruded as a sequestrum after many months. The problem is to remove the devitalized, thrombosed, and infected medullary bone, to eliminate that part of the dense cortical bone which cannot resist the spreading infection, and to leave behind only those areas which have an adequate blood supply to enable them first to deal with residual organisms and later to regenerate new bone.

Operation therefore consists in the subperiosteal excision of the lower border of the bone, together with the outer plate and all the infected medullary area. This frequently leaves a lingual plate less than 1/8 in. in thickness and only about 3/8 in. in vertical extent (Fig. 1). It has sometimes been argued that the exposure of uninfected bone by such a clearance would result in further osteomyelitis. This is not the case in such virulent infections as are encountered in acute mastoiditis, and does not seem to occur in the mandible if only vascular bone is left behind. Until

the advent of penicillin the overlying soft tissues of the cheek were then packed away from the bone and the cavity allowed to granulate from its depth. The sulphonamide group did much to control infection, but packing still seemed necessary.

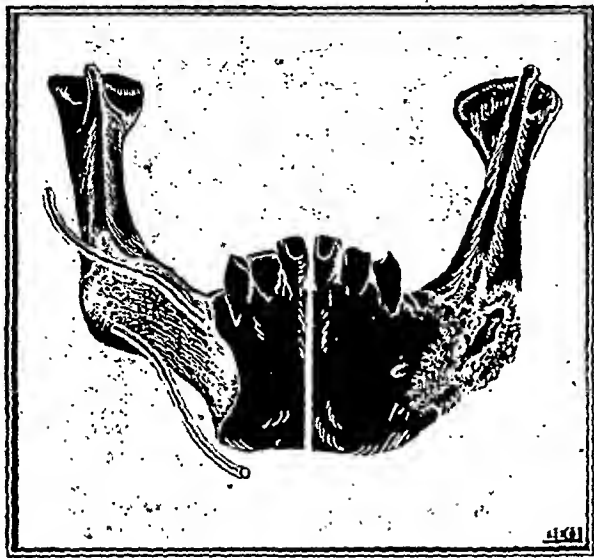


FIG. 1.—Schematic representation of osteomyelitis on the left side and the type of excision and the site of penicillin tubes on the right side.

When penicillin became available it was decided to continue this radical surgery with closure of the soft tissues. This has three advantages: (a) The soft tissues of the cheek may be closely approximated to the underlying bone, and can be expected to contribute to vascular ingrowth. (b) The closed cavity not only excludes secondary infection but also retains the penicillin, which is thus permitted to exercise almost continuous action. (c) Primary instead of delayed healing is obtained. Such a result in established bone infection presents an old and time-consuming problem in an entirely new light.

The technique which has been used in the cases here reported therefore consists in extensive surgical removal of bone as described above. During operation, bacteriological swabs taken from the centre of the infected area are sent for culture and penicillin-sensitivity test. Two small-bore tubes are then inserted through separate stab wounds—one to run along the upper border of the residual bone and the other along the lower edge. The wound of access is then closed without drainage even though it has extended through an abscess cavity.

Within about 18 hours a bacteriological report is available and penicillin treatment is begun. The usual dosage is now 1,000 units in 1 c.cm. into each tube every 24 hours. Immediately before each injection the cavity is aspirated through the penicillin tubes, and any resultant fluid sent for bacteriological investigation and penicillin-inhibition test. Treatment is continued until the wound is healed—on the average, ten days.

There is considerable similarity between all the cases in the group, and only two—one recent and one old—will be quoted at length.

**Case 1628.**—Soldier aged 21. May 1, 1943: Reported sick with a boil on the chin and swelling of the left side of the neck. Admitted to a hospital on May 12 with the original boil healed, but with an increase in the swelling of the neck. This was incised and three teeth were removed. Transferred to the Plastic Unit, July 9. He then presented a generalized swelling of the mental region with an extension to the left side. There were several recent scars and a discharging sinus in the neck. In the mouth, pus was welling up through two tooth sockets and through several fistulae. July 12: Operation. Extraction of 54321/1237. The mandible was then exposed from below and the lower margin removed almost as far back as the angle on each side. Excision of the full vertical extent of the outer plate revealed necrotic tissue occupying the medullary space. This also was removed, leaving a thin shell of normal bleeding lingual lamina. Two penicillin tubes were inserted and the wound closed. Finally the gum at the site of the extracted teeth was trimmed and sutured, thus completely closing the cavity.

July 13: Bacteriological report on the swab taken at operation showed penicillin-sensitive *Staph. aureus* + + +. Penicillin 1,000 units 1 c.cm. injected into each tube twice daily. July 21: Aspirated fluid has been sterile for the past five days. All stitches removed, a sound suture line on both the mucous and the skin. Aug. 5: Discharged to a convalescent home. On Sept. 23 returned to duty, wearing dentures with comfort and showing negligible scarring.

**Case 1318.**—An elderly woman giving a history of swelling of the right side of the face, starting early in 1941. Has spent months in hospitals, and has had extractions of roots, drainage of abscesses, and removal of sequestra. Examination (May 18, 1943) showed a swelling of the whole body of the mandible, with mucous sinuses in the mouth and two discharging wounds under the chin. May 22: The mandible was exposed from the right coronoid notch to a point an inch above the angle on the left side. The lower margin and the outer plate were excised over this area to expose a cavity in the mental region about  $2\frac{1}{2}$  by 1 in. containing a sequestrum which was in fact a circumscribed area of osteitis fibrosa. In the region of the angle and ascending ramus on the right was a similar area of osteitis fibrosa, which was uninfected. In less degree the same condition was present on the left. All abnormal bone, infected or not, was removed, and the wound sutured, except for  $1\frac{1}{4}$  in. at the posterior end on each side. (This was the first case treated with penicillin, and the only one in which tubes were not inserted.)

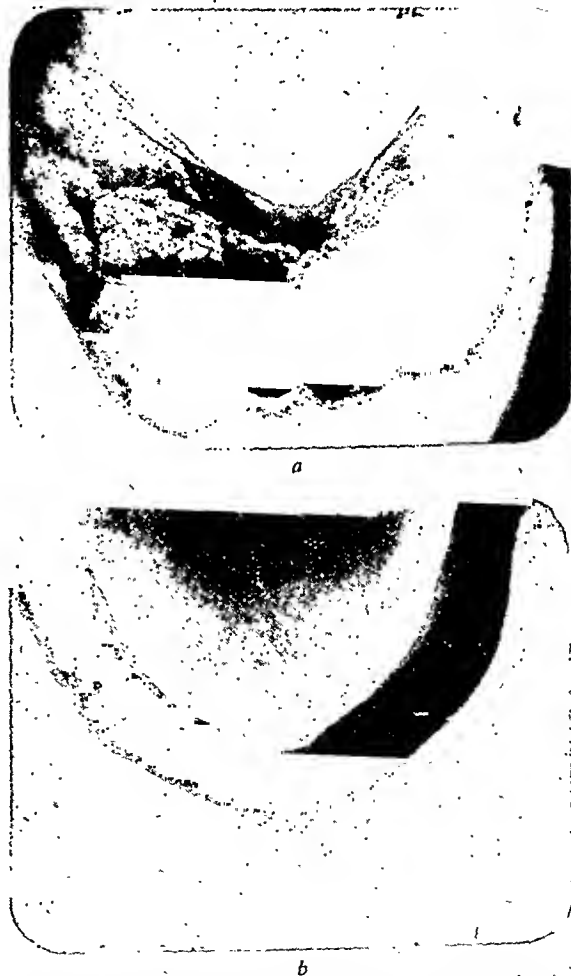


FIG. 2.—Case No. 1318. Occlusal radiographs showing: (a) an area of osteitis fibrosa lying as a sequestrum in the mandible; (b) appearance of the same jaw seven months after excision and penicillin treatment.

A bacteriological swab showed haemolytic streptococci + + anaerobic *Strep. viridans* + +, and monilia. 4,000 units of penicillin were injected for the first two days, and thereafter 2,000 units a day for the next five days. May 27: Sutured wound healed, though the posterior sinuses were still open but sterile. June 22: Spontaneous discharge of much pus, together with one small sequestrum evidently overlooked at operation. Cultures sterile. June 29: A wound, both on the surface and in the mouth, soundly healed. Feb. 19, 1944: Review. There has been no further disturbance. The scars are satisfactory, and the radiograph shows good bone regeneration, with no evidence of either infection or residual osteitis fibrosa. (Fig. 2.)

## Complications

1. The deliberate avoidance of drainage does not prevent the continuance of soft-tissue breakdown, and an accumulation of pus may need evacuation. This has so far been found to be sterile, and the resultant sinus closes rapidly.
2. Persistence of discharge, sometimes associated with a change in bacteria, has occurred twice. In each instance it has been due to incomplete removal of affected bone. One case was subsequently reoperated on with success. The other, which acquired a coliform infection about the tenth day, became much more extensive, and has not yet been subjected to further operation.
3. In two cases removal of all infected bone has created a section of mandibular continuity. In one elderly woman no fixation was necessary, and satisfactory union occurred. In the other case the division was close to the condylar neck, and splintage was applied. It is as yet too early to assess the final result, but union seems to be progressing.
4. When the main infection lies on the lingual side of the jaw the detached muscles of the floor of the mouth swing away from the bone, and in these cases closure of the skin alone leaves a large cavity. It may not always be wise to close the whole wound in these circumstances, but rather to pack with penicillin gauze. Although this may result in bacteriological control, there is no reason to expect much increase in the rate of healing.

## Summary

It is pointed out that penicillin is unlikely to give bacteriological control to the presence of sequestra or unfavourable surgical conditions. It is therefore no substitute for adequate surgery.

In four cases in which penicillin has been used as a "prophylactic" there is evidence that the infection has been rapidly controlled without any undesirable local effects.

A conception of the dominant role of vascular disaster in the causation of bone infection is advanced, and a technique for treatment of osteomyelitis of the jaw based upon this is described.

The adjuvant effect of penicillin has led to the conversion of the original open method to a closed one, with all the advantages this confers. In the 16 cases so treated elimination of all penicillin-sensitive organisms, satisfactory soft-tissue healing, and good regeneration of the bone have taken place, so that recovery from what has hitherto been an extremely chronic condition has been effected in an average of about 30 days.

I am indebted to the Penicillin Clinical Trials Committee of the M.R.C. for supplies of penicillin used in this series; to Prof. L. P. Garrod for constant supervision of the bacteriological aspect of these cases; to "Bundles for Britain," who provided a generous fund for the maintenance of the laboratory in which the work was carried out; and to all members of the Plastic and Jaw Unit at Hill End Hospital, who have been of so much assistance in the clinical control of the cases. To all of them I desire to express my very sincere thanks.

## PENICILLIN IN BONE INFECTIONS

BY

IVOR M. ROBERTSON, F.R.C.S.D.

Apart from the observations of Florey and Florey (1943) on the treatment of acute osteomyelitis, there is little published information about the use of penicillin in orthopaedic surgery. An attempt has therefore been made to explore its value further, and the results in 34 cases will be described, nine of which received systemic and the remainder only local treatment.

## Acute Haematogenous Osteomyelitis

This group comprised 7 cases, all in children. With one exception penicillin was used as an adjunct to surgery; the wounds following surgical exploration were packed lightly with petroleum jelly gauze and enclosed in plaster, a window being cut to allow of inspection and taking swabs for culture. Systemic penicillin treatment was given by various routes, dosage being calculated roughly according to body weight, and based on an adult dose of 120,000 units daily. The methods of administration used are described by Morgan, Christie, and Roxburgh (p. 515).

**Case 1.**—K. P.; female, aged 12. Acute osteomyelitis of lower third of right femur of 3 days' duration. Coagulase-positive *Staph. aureus* in blood and pus. Treated by incision of subperiosteal abscess and drilling of femur. Penicillin treatment began on fourth day of disease (1,031,000 units in 13 days). On completion of systemic treatment the wound was packed for the next 24 hours with gauze soaked in penicillin solution. Thereafter, decreasing amounts were instilled into the wound daily. Penicillin cream was employed in later stages of healing. The total amount used for local treatment was 62,000 units. Wound sterile on 14th day; complete epithelialization on 32nd day. X-ray changes minimal.

**Case 2.**—J. B.; male, aged 14. Acute osteomyelitis of lower third of right femur of 8 days' duration. Blood culture and pus: coagulase-positive *Staph. aureus*. Treated by incision of subperiosteal abscess and drilling of femur. Penicillin given systemically (860,600 units in 14 days). Effusion into right knee-joint aspirated at same operation (culture, *Staph. aureus*). Joint aspirated on 4 occasions on alternate days and 10,000 units penicillin injected. After 4th aspiration the contents were sterile. Knee recovered full function. Wound sterile on 14th day; completely healed on 43rd day. X-ray changes minimal.

**Case 3.**—P. R.; female, aged 12. Acute osteomyelitis of upper third of right femur of 31 days' duration. Coagulase-positive *Staph. aureus* in pus from wound. Treated by exploration of upper third femur and drainage of large subperiosteal abscess. Penicillin given systemically (1,087,000 units in 20 days). Further exploration 15 days later. Trochanter region of femur opened up by guttering. Wound healed in 100 days. Further exploration became necessary. Gross x-ray changes present. Penicillin therapy was restarted; 660,000 units given intramuscularly over period of 11 days. Wound healing.

**Case 4.**—R. P.; male, aged 12. Acute osteomyelitis of lower third of right ulna, upper third right humerus, lower third of right and left femur of 14 days' duration. Coagulase-positive *Staph. aureus* in blood culture and in pus from superficial abscess. Extremely ill. Temperature 102°; pulse 110. Bronchopneumonia present. Pain and tenderness were not localized to areas indicated above, but were associated with effusion, pain, and stiffness of all neighbouring joints. Superficial abscess discharging on forearm. No indication as to the site of primary focus, and bony lesions were never localized enough to merit surgical incision. Treated by intravenous penicillin; later changed to intramuscular drip. Total amount given, 761,250 units in 10 days. Complete recovery in 60 days. X-ray changes minimal.

**Case 5.**—J. B.; male, aged 10. Acute osteomyelitis of lower third of right femur of 2 days' duration. Coagulase-positive *Staph. aureus* in pus from wound. Treated by incision and drilling. Penicillin given intramuscularly (434,350 units in 9 days). Wound granulating. Temperature normal. On the 6th day after treatment the left leg became tense and painful. There was a rise of temperature, which continued until the intramuscular drip was discontinued. Temperature fell immediately, and has remained normal ever since. Wound epithelialized in 45 days. X-ray changes minimal.

**Case 6.**—B. W.; male, aged 5. Acute osteomyelitis of upper third of right tibia of 10 days' duration. Blood culture sterile. Coagulase-positive *Staph. aureus* in pus. Treated (before admission) by sulphathiazole (14 g.). When admitted, treated by incision and drilling. Penicillin given intramuscularly (440,000 units in 11 days). On the 6th day of intramuscular treatment the left leg became tense and painful. This was accompanied by an inguinal adenitis and rise of temperature. On 10th day wound sterile. Secondary suture performed. Small rubber tube inserted through upper end of wound. Penicillin instilled daily for 11 days (36,000 units). Wound soundly healed in 26 days. X-ray changes minimal.

**Case 7.**—D. E.; female, aged 18 months. Acute osteomyelitis of upper third of left tibia of 1 day's duration. Coagulase-positive *Staph. aureus* in pus. Treated (before admission) by sulphathiazole (4 g.). When admitted, treated by incision and drilling. Intramuscular injections of penicillin given 3-hourly (350,000 units in 12 days). Still under treatment.

**Comment.**—Case 4 differs from the rest in that no surgical treatment was employed. This boy had a positive blood culture and a severe infection which might well have been fatal. A positive blood culture was also obtained in Cases 1, 2, 5, and 6, in which the disease had existed for 3, 8, 2, and 10 days respectively. Case 3, with a pre-treatment duration of 31 days, is the only one in the series to run a prolonged course, and is not yet well.

These results may be compared with those of McKeown (1943), who describes 26 cases treated with sulphathiazole and various types of surgical intervention. The 17 cases treated with sulphathiazole and by bone-drilling at an early stage of

the disease gave the best result of any method used, and reduced the duration of the disease by 60%. Of the 17 cases, none was healed completely under three months. Most of the cases healed in three, four, or five months, but the average was six months. Four cases in our series of six (i.e., excluding Case 4, which did not require surgical intervention) healed completely, with minimal x-ray changes, in 32, 43, 45, and 26 days respectively. These four cases have encouraged us in the hope that the duration of the disease may be further curtailed by the use of penicillin.

### Local Treatment

#### (a) Chronic Haematogenous Osteomyelitis

In the local treatment of this condition penicillin was used in three forms: (i) a solution of calcium penicillin in distilled water usually of a strength of 1,000 units per c.cm.; (ii) a cream containing 400 units per gramme in a base consisting of equal parts of lanette wax S.X., petroleum jelly, and water; (iii) powder containing 2,000 units per gramme in sulphanilamide with 5% magnesium oxide added to prevent caking. The position, nature, and extent of the infection had to be taken into account when deciding on choice of preparation and method of application. Cases with sinus formation leading down to infected bone were usually treated with penicillin in solution, instilled either directly into the sinuses or through a small-bore rubber tube or tubes extending well down the sinus. In some cases the tube was withdrawn immediately after each treatment, but in others it was left in place and withdrawn gradually each day. The tubes were kept in position on an average from 7 to 10 days, depending on the bacteria present. Bacteriological examinations were made frequently from the aspirated material.

Cases in which surgical treatment had been limited to sequestrectomy presented a more difficult problem. A bony cavity was usually present, and its position often made retention of penicillin solution extremely difficult if not impossible. In some cases it was possible to maintain a tube in position so that the injected penicillin had some chance of reaching all infected areas. The amount of penicillin injected varied with the size and extent of the bony cavity. From 4 to 10 c.cm. was used on an average. The tube was closed by a spigot to prevent loss, and the instillations were made once every 24 hours.

In many cases closed plasters were used, with a window cut to allow dressing and inspection of the wound. This was restricted as much as possible, the tube being led through the dressings so that the daily injections could be carried out without disturbing the wound itself. Cases with exposed bone, and particularly those presenting a "trough" appearance, were filled with penicillin solution, and retention was maintained by splinting or positioning the limb. In cases that had been "saucerized" penicillin-sulphanilamide powder or cream was used. Applications were made once every 24 hours.

Case 1.—M. H.; female, aged 20. Osteomyelitis of femur of 3 years' duration with wide sinus leading to bone. *Staph. aureus*. Treated by sequestrectomy followed by direct application of solution through tube fixed into sinus. 7,000 units per day for 7 days. Wound sterile after 5 days and healed completely in 3 weeks. (Solution was well retained in this sinus, and fluid withdrawn before a further injection was still active.)

Case 2.—M. J.; female, aged 34. Sinus over right sacro-iliac joint in connexion with old tuberculous joint. Duration, 9 years. *Strep. pyogenes* and *Staph. aureus*. Treated by instilling penicillin solution into the sinus (72,500 units in 13 days). Temporary slight improvement, but relapse after stopping treatment.

Case 3.—W. H.; male, aged 48. Chronic osteomyelitis of femur of 30 years' duration with a large elongated cavity (5 by 1½ in.) on outer aspect of thigh extending to bone. *Strep. pyogenes*, *Staph. aureus*, diphtheroids, and coliforms. Treated by exploration. No sequestra found. Positional flooding of cavity with penicillin solution (131,000 units over 12 days). No improvement.

Case 4.—J. F.; male, aged 19. Chronic osteomyelitis of lower third femur of 2½ years' duration, with several small sinuses and incompletely healed wound of sequestrectomy. Gram-positive cocci, diphtheroids, and *Proteus*. Treated by sequestrectomy. Sinus injected with penicillin solution through catheter (40,000 units in 34 days). Wound packed with cream. Sinuses persisted.

Case 5.—W. B.; male, aged 33. Chronic osteomyelitis of lumbar vertebra (4), with track leading out above left iliac crest; 8 months' duration. *Strep. pyogenes* and *Staph. aureus*. Treated by dilatation of sinus at operation. Tube left *in situ*. Penicillin solution run in through tube (31,000 units in 9 days). Wound sterile in 3 days. Sinus much smaller.

Case 6.—J. S.; male, aged 41. Acute exacerbation of chronic osteomyelitis of 3 months' duration, with cavity in upper end of (2 by 3¼ in.) leading to sinus. *Staph. aureus*. Treated by drill bone and scraping cavity. Wound partially closed and tube left extending down to bone cavity. Penicillin solution instilled (36,600 units in 6 weeks). Sinus healed temporarily.

Case 7.—T. P.; male, aged 19. Chronic osteomyelitis of tibia of a year's duration, with a large open cavity on the ante surface containing stinking pus and with sloughs on its soft walls, exposing bone of upper third, and multiple sinuses. *Staph. aureus* and *Proteus*. Treated by positional flooding with penicillin solution (311,000 units in 41 applications over 3 months). Wound treatment was begun; amputation of this leg had been advised. Limb being immobilized, the solution was retained in the large cavity although this was wide open, and usually preserved its activity or renewed. The exudate lost its offensive smell; the borders of the cavity became clean, and its size steadily diminished until it was almost completely filled up and healed by granulation. Unfortunately, other sinuses discharged, and further sequestrectomies have since been necessary: the patient is still under treatment.

Case 8.—R. N.; male, aged 18. Sinus of right groin due to chronic osteomyelitis of ilium of 6 years' duration. *Staph. aureus*. Treated by instillation of penicillin solution into sinus with catheter *in situ* (32,000 units over 16 days). Discharge sterile on the 12th day. Sinus healed at the end of course of treatment, but leg broke down.

#### (b) Osteomyelitis after Compound Fractures

Five such cases were treated by similar methods, of which brief histories follow together with those of two infected operation wounds.

Case 9.—W. D.; male, aged 30. Small wound on anterior aspect of right leg with bare bone visible, of 6 weeks' duration, the result of a compound fracture of the tibia. *Strep. pyogenes* and *Staph. aureus*. Treated by application of penicillin powder and later cream to the wound (14,300 units in 17 days). Wound was then explored and several small sequestra removed. A rubber drainage-tube was inserted through a separate stab wound and the skin edges closed. Penicillin solution was instilled (136,000 units over 16 days). Tube and stitches were then removed, and the wound, which appeared to be healed, was insufflated with powder. Wound broke down slightly two days later, and was treated with a further 23,000 units of solution. This sinus healed in 15 days and remained healed for two months, when it broke down again.

Case 10.—F. S.; male, aged 42. Long sear on anterior aspect of leg with granulating gutter leading to necrotic bone at lower end, due to chronic osteomyelitis of 19 months' duration, following compound fracture of the ankle. *Staph. aureus* and diphtheroids. Treated by insufflation of penicillin powder (30,000 units in 25 days). Infection persisted.

Case 11.—R. H.; male, aged 21. Gutter-shaped wound of 13½ weeks' duration, 7 in. long, on antero-lateral surface of leg, with bone exposed at lower end, due to compound fracture of tibia. *Staph. aureus* and *Proteus*. Treated by positional flooding with penicillin solution (14,000 units in 2 days). After sinuses had been laid open at operation, powder was used (36,000 units in 18 days). No change in the condition of the wound. Infection persisted.

Case 12 (a).—W. S.; male, aged 36. Cross leg flap to repair skin loss of right leg due to chronic osteomyelitis of 2 years' duration. *Strep. pyogenes* and *Staph. aureus*. Treated by injection of penicillin solution (two doses) into wound and by application of cream (27,000 units in 15 days). Wound rendered sterile.

Case 12 (b).—Further course of treatment undertaken 3 weeks later. *Strep. pyogenes* (Type 27) and staphylococci. Treated by injection of penicillin solution below flap (42,000 units in 2 weeks). Osteitis remained unchanged.

Case 13.—F. L.; male, aged 40. Infection, of 6 weeks' duration, of iliac crest, which was donor site for cancellous bone graft. *Strep. pyogenes* and *Staph. aureus*. Treated by injection of penicillin solution into infected wound (18,000 units in 9 days). Streptococci disappeared in 24 hours. No clinical improvement.

Case 14.—J. G.; male, aged 26. Active sinus of 3 months' duration leading to chronic osteomyelitis of lower third tibia of 2 years' duration following compound fracture. *Staph. aureus*. Treated by introduction of penicillin solution into sinus (24,000 units over 12 days). Sinus closed, but later broke down.

Case 15.—R. T.; male, aged 48. Widely infected wound (7 by 3 in.) of 3 weeks' duration, following bone graft at lower end of tibia. Graft exposed. *Staph. aureus* and *Ps. pyocyanea*. Treated by applying penicillin solution with a spray (32,000 units in 9 days). Infection persisted.

Comment.—The results of treatment by local application of penicillin in cases of chronic bone sepsis have so far proved very disappointing. Of these 16 cases complete healing occurred

one only. In seven there was only temporary improvement, in eight none. At least three factors appear to be responsible for the unsatisfactory results:

1. *Failure of Continuous Application.*—The mechanical difficulties securing continuous action are great. Solution may escape sinuses and often cannot be retained at all in large shallow wounds. Case 7 was an exception: complete immobilization enabled the solution to be maintained in the wound for two months, which steadily proceeded to heal in spite of the presence of a resistant organism (*Proteus*) together with a susceptible one (*Staph. aureus*).

2. *Inaccessibility of the Bone Infection.*—In many cases it seemed probable that the penicillin solution instilled down a sinus or introduced into a bone cavity reached the whole of the infected area, areas of deep osteitis persisting, and only the superficial infection being affected (e.g., Cases 4, 6, and 7). It was shown in Case 9 that bone cavity can be sterilized temporarily, but on the cessation of treatment the infection recurred. Re-infections may occur from the sinus in some instances, but in a number of cases it was observed that the infecting organism was identical with that present in the wound before sterilization (Case 12, *a* and *b*). This suggests that deeper areas of osteitis remained untouched.

3. *The Presence of Dead Bone.*—Regardless of their accessibility otherwise to penicillin, however administered, there were evidently, in some of these cases, areas of bone of which the surgical removal was necessary before healing could occur. In the presence of sequestra, penicillin treatment unaided by surgery has been unsuccessful.

In the group of compound fractures, those cases presenting a guttered wound with gross skin loss and bare bone exposed in the depths were particularly resistant to treatment, the mixed bacterial flora remaining unaltered and the healing of the wound being delayed. (Cases 10, 11, and 15).

It is hoped to improve on these discouraging results by a policy that is now under trial in several cases, results of which are not yet available. This is the more radical removal of infected bone, followed by complete closure, if necessary with the aid of a full-thickness graft, and subsequent instillation of penicillin solution through a tube.

#### Miscellaneous Cases

In this group 12 miscellaneous orthopaedic cases were treated with penicillin—ten locally and two systemically.

##### Section 1—Local

(a) Post-operative wound infections (5 cases). (b) Soft-tissue sinus associated with chronic osteomyelitis of hip (1 case). (c) Infected Steinmann-pin holes (2 cases). (d) Gunshot wound of shoulder region (1 case). (e) Chronic sinus associated with plating of femur (1 case).

(a) Five cases of post-operative wound infections were treated at intervals varying from 3 to 130 days after operation. In all cases the method was to instil the solution by means of a catheter into the sinus twice daily, the total dose varying with the size of the sinus and the duration of the treatment. The average was 39,000 units in 34 days. Two cases healed completely, two showed temporary improvement, and one showed no improvement.

(c) Two cases of infected Steinmann-pin holes were treated. The pin tracks were in the upper end of the tibia just below the tubercle. They were treated by injection of penicillin solution into the track. Complete healing occurred in both cases at the end of 27 and 13 days respectively.

(d) A case of osteomyelitis of left shoulder with chronic sinus resulting from a gunshot wound of the shoulder 10½ months previously, and with a foreign body still in the depths of the wound. This case was treated by surgical drainage and the instillation of penicillin solution by means of rubber catheters into sinuses daily for 25 days (total, 235,500 units). This resulted in a slight improvement in the condition of the wound.

(e) A case of infection in a plated femur treated by local applications of penicillin solution unsuccessfully. The plate was later removed at an operation, and a subsequent course of penicillin therapy was carried out (101,000 units in 13 days, introduced into a catheter fixed *in situ*). Complete healing occurred in 19 days.

##### Section 2—Systemic: Compound Fractures associated with Chronic Osteomyelitis

Case 1.—J. P.; male, aged 38. Deep epithelized trough of 6 months' duration on anterior surface of lower leg with an island of bare bone in centre following compound comminuted fracture of upper end of tibia with gross skin loss. *Staph. aureus*; diphtheroids. *Systemic treatment:*—Intravenous penicillin, 30,000 units per pint of dextrose-saline 6-hourly for 6 days (total, 720,000 units). Dis-

continued owing to thrombophlebitis of long saphenous vein. Intramuscular injections (15,000 units 3-hourly for 4 days; total, 480,000 units). Injections discontinued owing to patient's complaining of severe cramping pains at site of injection. Intravenous penicillin restarted, and given for 3 days (total, 360,000 units). *Local treatment:*—3,500 units of penicillin cream applied to wound daily for 3 days. Systemic treatment had been discontinued. *Result:*—The wound was sterile at the end of the course of treatment and permitted delayed secondary suture of the wound with excision of protruding necrotic bone. Wound remained healed for seven weeks and then broke down. The infecting organisms were identical with those present before sterilization.

Case 2.—F. S.; male, aged 42. Trough-shaped discharging wound (2½ by 1 in.) with bare bone visible at the lower end of tibia of 18 months' duration, following compound fracture-dislocation of ankle. *Coagulase-positive Staph. aureus* and diphtheroids. *Systemic treatment:*—Intravenous penicillin was given, 30,000 units per pint of dextrose-saline 6-hourly for 5 days in left leg (total, 600,000 units). This was discontinued owing to increasing oedema of left leg due to thrombophlebitis. Intramuscular injections (15,000 units 3-hourly for 6 days; total, 720,000 units). This was accompanied by a persistent pyrexia (100–102°) throughout course of systemic treatment. *Local treatment:*—13,000 units of penicillin were applied over a further 25 days in the form of cream. *Result:*—Staphylococci and streptococci had disappeared by the 11th day of systemic treatment, but coliforms persisted throughout. Considerable improvement in the wound permitted further sequestrectomy. Healing has progressed slowly, but no major breakdown of the wound has occurred since.

*Comment.*—The majority of the locally treated cases in this miscellaneous group responded well, possibly because the lesions were of small extent, involving mainly soft tissues, and usually not of long standing. The two cases treated systemically were costly failures: over a million units of penicillin were used in each with little ultimate benefit. This drastic treatment was decided on as an experiment when local application in similar cases had failed. To judge by its results in these two cases, this expenditure of penicillin is unjustified, and long-standing sepsis involving bone must be considered an unfavourable field for treatment, either local or systemic.

#### Summary

Early acute haematogenous osteomyelitis was treated systemically with penicillin in 7 cases with good results: 6 of these were also subjected to orthodox surgical treatment.

Systemic treatment in 2 cases of chronic sepsis following compound fracture was of only temporary benefit.

Local application of penicillin was employed in treating 8 cases of chronic haematogenous osteomyelitis: 7 cases of osteomyelitis following compound fractures, and 10 miscellaneous cases, mainly chronic sinuses. The reasons for the failure of the treatment in many of these cases are discussed.

#### REFERENCES

- Flory, M. E., and Flory, H. W. (1943). *Lancet*, 1, 387.  
McKeown, K. C. (1943). *Brit. J. Surg.*, 31, 13.

## THE LOCAL APPLICATION OF PENICILLIN IN SOFT-TISSUE LESIONS

BY

J. N. BARRON, F.R.C.S.

AND

O. T. MANSFIELD, F.R.C.S.

This report deals with cases under treatment in an E.M.S. plastic unit. The surgical treatment of these cases involved reconstructive procedures for various types of tissue loss, under conditions in which the control of infection by pyogenic organisms has always been a predominant problem. The cases reported do not represent the total number treated (45 out of 70), but are chosen only on the grounds that reasonable conclusions can be drawn from them. Of these selected cases seven are detailed in the text as illustrations. Because of the wide variety of conditions treated, a somewhat arbitrary classification is adopted in order to avoid innumerable subdivisions. These can in no way be considered as a series.

#### Group A: Infected Skin Lesions

These consist of infected eczematous, impetigo, the so-called capillary lymphangitis, and similar skin eruptions with pustule



formation. Several have occurred on Thiersch graft donor areas. There were 7 cases in this group, all infected with haemolytic streptococci, staphylococci, or both. All except one cleared up in 10 to 14 days, but some relapsed later. In all cases the preparation used was a cream containing 400 units of penicillin per gramme in a base composed of equal parts of lanette wax S.X., soft paraffin, and water.

**Case 1.**—A soldier aged 29 had a surgical correction of an adherent scar on the dorsum of the right index finger. After operation he developed a staphylococcal eczema round the surgical area, and the infection involved the suture lines. This was sterilized in two days with penicillin and remained sterile for eight days, in spite of which the eruption spread.

The occurrence of an eczema induced by the use of the cream in two subsequent cases provides a possible explanation of this result. One of these later cases had a positive patch test to the cream, the presumed irritative agent being the soft paraffin employed. This is under investigation.

This group of cases suggests that skin lesions infected with penicillin-sensitive organisms respond according to the technique of application. Where the lesions were open and the penicillin had ready access to the foci of infection the results were satisfactory, but in closed lesions temporary improvement was followed by relapse when treatment was stopped. It is possible that careful skin toilet followed by penicillin inunction may prove to be more effective in these resistant cases.

#### Group B: Abscess Cavities

Penicillin solution in a strength of 1,000 units per c.cm. was injected into five abscess cavities. Of the results two were successful, one was doubtful, and there were two failures.

**Case 2.**—A woman aged 22 for whom a cancellous iliac bone graft was used to reconstruct a syphilitic saddle deformity of the nasal bridge. After operation she developed a haematoma in the region of the graft in the nasal bridge. This remained quiescent for seven days and then suddenly became infected. She was returned to the theatre and bilateral drainage instituted. There was a mixed haemolytic streptococcal and staphylococcal infection, which responded immediately to penicillin injected into the cavity, and the drainage wounds were healed in four days. There was no loss of the cancellous bone.

**Case 3.**—A man aged 22 for whom a bone graft similar to that described above was used in the correction of a traumatic nasal bridge deformity. There was a rapid post-operative infection, with pus formation on the third day. At this time bilateral drainage was done and penicillin injection started. The infection was penicillin-sensitive *Staph. aureus*. This treatment was continued for a week with no change in the discharge or the infection, so that penicillin was discontinued. Conservative treatment was advised, and the discharge gradually decreased until a month later a small sequestrum was evident, the removal of which effected rapid healing.

Consideration of these two cases shows that one salient feature was the time of onset of the infection. Advocates of the cancellous-bone-grafting technique hold that this bone derives a primary blood supply from the surrounding tissues and thus survives as a true graft. In Case 2, then, several days had elapsed before infection supervened, so that the bone cells by that time might be considered to have survived the transplanting procedure. Under these conditions the early treatment of infection should tend to prevent sequestration and thus promote the rapid resolution of the infective process.

In Case 3 the disaster occurred before viability was established in the graft, so that in spite of treatment a portion of the bone died and thus perpetuated the infection, which did not clear up until sequestration was complete. The small size of the sequestrum (it was a wafer from the subcutaneous surface of the bone) does suggest that this tissue lends itself favourably to transplantation.

A further inference that can be drawn is that penicillin in the presence of necrotic tissue does not appear to have much influence upon the infection. In this and other similar cases no clinical improvement was demonstrated with the use of penicillin. Thus where a penicillin-sensitive infection does not rapidly respond to adequate application much time will be saved if a search for complicating factors is made.

**Case 4.**—A young soldier was admitted for reconstruction of the chin and incisor region of the mandible, lost as the result of a gunshot injury. The mandible had been made good by a bone graft,

and at the stage under discussion his lower buccal sulcus had been re-made by a Thiersch grafting operation. Owing to a small breakdown in the graft an abscess appeared in the soft tissues of chin. The bacteriology was very mixed, some organisms being sensitive to penicillin and others not. The treatment consisted of filling the cavity via the mouth with penicillin after expression of the pus. Although a small fistula opened on to the skin surface the abscess was healed in six days.

This type of breakdown has in the past been a matter of regret, in so far as many weeks pass before it attempts to heal and considerable scar is left in its train. In the above case it is felt that the early control of infection in this area prevents sufficient breakdown for the wound to become chronic.

The case in this group which has been described as doubtful was a surgically drained subcutaneous abscess in a hand, the organism being a penicillin-sensitive staphylococcus. This case followed the ordinary course resulting from adequate surgical drainage, and did not present any special features during the healing phase.

**Case 5.**—This patient was an 11-year-old boy with a severe phosphorus burn of the leg of three months' duration. The soft tissues on the posterior aspect of the knee-joint had been destroyed, leaving the external femoral condyle visible in the wound. He was critically ill at this stage with an intermittent profuse purulent discharge from an acute pyarthrosis, and an endeavour was made to combat this infection by the local instillation of penicillin into the joint cavity by means of Carrel tubing. This treatment resulted in no improvement, and it was quite obvious that the penicillin did not have access to all parts of the infected joint. The treatment was stopped and traction applied. Slow improvement occurred, and eventually the joint sinus healed.

This case illustrates well the precept that the technique of application must be efficient or the results will be unfavourable. The results of local application are truly local, so that adequate access must be provided.

#### Group C: Acute Spreading Cellulitis

Five cases of acute invasive infection under skin flaps designed for reconstructive purposes were treated by the early instillation of penicillin solution. In all cases progress of the infection was halted and resolution was rapid. Previous experience of this complication with skin flaps, the blood supply of which is necessarily much curtailed, confirms that these results have not been attained by other methods of treatment.

In the second series of cases under this heading 11 insets of tubed pedicle grafts were treated in a similar manner. In five of these loss of tissue resulted which necessitated further surgery; in the other six the insets survived. The controlling factor appeared to be the blood supply of the part rather than the infection. In some of these cases, although the infection was controlled, retrograde intravascular thrombosis continued, with progressive tissue loss.

From the results in this group it is felt that penicillin is of value in controlling infection which the depleted blood supply of the tissue itself would be unable to cope with, and on these grounds the prophylactic use of penicillin may have a wide application.

#### Group D: Superficial Wounds with Skin Loss

In this category there were 17 cases. All were treated with penicillin cream. The variety of these lesions introduces so many extraneous factors that general conclusions are all that can be drawn from them. These conclusions can be illustrated by individual case reports.

(a) Penicillin can sterilize a wound and prevent its reinfection with sensitive organisms. It does not necessarily follow that a wound thus sterilized will heal.

**Case 6.**—A soldier aged 23 was given x-ray therapy three years previously for warts on the right hand. He was admitted for the treatment of a radio-necrosis of the index finger and thumb, the middle finger having already been amputated. During a skin-flap replacement of the dorsum of the index a linear breakdown occurred in a suture line, which became infected with *Staph. aureus*. This was sterilized in two days and kept sterile for 32 days by using penicillin cream. During this time there was no attempt at healing, and a cervical sympathetic block was done. This produced a response in the disorganized vascular system and the wound healed.

(b) If reinfection of a wound occurs after sterilization by penicillin a sensitivity test should be done on the new invader, it may be resistant.

Case 7.—A soldier aged 23 was undergoing total reconstruction of the thumb. A pedicle graft had been raised and transferred to the thenar remnant, and at this stage both ends of the pedicle were attached to the hand. As the result of some slight trauma the pedicle ulcerated and became infected with penicillin-sensitive *Staph. aureus*. Penicillin cream was used as a dressing, and sterility was obtained in five days. The wound remained sterile for 16 days without any clinical change and then became reinfected with *Staphylococci*. Penicillin was continued for 27 days without clinical or bacteriological effect. Finally treatment was stopped and the ulcer eventually healed.

(c) Although sensitive organisms may disappear from culture, the wound may be so infected with *pyocyanens*, *proteus*, or the oliforms as secondary invaders that no clinical improvement is noted or indeed can be expected. This was a common finding, particularly in this group of cases.

(d) Penicillin can be a useful adjunct to surgery, but does not replace it. Certain surgical principles may need modification to comply with the requirements of penicillin application.

### Summary

These experiments with the local use of penicillin to date indicate that we have an effective weapon in the fight against tissue invasion by certain of the pyogenic cocci. The points that emerge are:

1. Early application is most desirable.
2. Efficient technique must be used to bring penicillin into contact with the infective process.
3. Tissues necrosed as the result of infection are removed by natural processes. Many wounds containing slough or sequestra resist sterilization by penicillin. In some of these cases it is probable that attempts at sterilization impede slough removal and so delay healing.
4. Penicillin as an adjunct to adequate surgical technique is a valuable advance in the treatment of wounds infected with sensitive organisms.

## LOCAL TREATMENT OF BREAST ABSCESS WITH PENICILLIN

BY

DONALD B. FRASER, F.R.C.S.

Simple aspiration under local anaesthesia has in some hands given good results in the treatment of mammary abscesses, and it seemed logical to add to this penicillin replacement when supplies became available. A series of 15 consecutive cases has been treated, and case histories, with interpretation of results, are here given.

The technique used was simply to infiltrate the skin with a stab of 2% novocain and to aspirate through a needle with a 20-cm. syringe. Staphylococcal pus is sometimes thick and breast abscesses are notoriously loculated, but by using saline wash-outs when necessary it was usually possible to evacuate them with fair efficiency. The organism in every case proved to be coagulase-positive *Staphylococcus aureus*. No strains resistant to penicillin were encountered. A solution of calcium penicillin in distilled water of a strength of 2,000 units per c.cm. was then injected through the same needle, dosage varying from 2,000 to 20,000 units according to the size of the abscess. Aspiration and injection of penicillin were usually repeated at two-day intervals: the pus obtained on the second and subsequent occasions was usually sterile or nearly so, and, when placed in an agar cup in a plate inoculated with the standard Oxford H. staphylococcus, produced a zone of inhibition indicating that penicillin was still present in effective concentration after 48 hours. I am indebted for the bacteriological investigations to Dr. J. C. Ford.

Except in three of the earlier cases, breast-feeding was discontinued and lactation suppressed by restriction of fluids, mild aperients, and stilboestrol 5 mg. daily for 5 days. The breasts were firmly supported with crepe elastic bandages.

### Case Histories

Case 1.—Primipara aged 23. Painful breast after 5 weeks of lactation. Admitted Jan. 15, 1944, with large breast abscess and

infection involving most of breast. Same day: Aspiration 40 c.cm. pus; 12,000 units penicillin. Jan. 16: Aspiration 16 c.cm. pus; 10,000 units penicillin. Result:—Next day spontaneous discharge from aspiration site and rapid resolution. Home in 8 days.

Case 2.—Multipara aged 30. No recent pregnancies. Two small breast abscesses in past year treated by surgical drainage. Three weeks ago, gradual development of another, involving one-third of the breast above and behind areola. Dec. 28, 1943: Aspiration 7 c.cm. pus; 10,000 units penicillin. Dec. 30: Aspiration 12 c.cm. pus; 8,000 units penicillin. Jan. 1, 1944: Aspiration 14 c.cm. pus. Result:—Remained closed, and on Jan. 14 there was good resolution.

Case 3.—Aged 23. Breast abscess following weaning at 10 months, involving about one-quarter of breast. Duration 8 days. Treatment:—July 11, 1943: 10,000 units of penicillin injected immediately after aspiration of 5 c.cm. of pus: pentothal anaesthesia, as patient was very nervous. Twenty-four hours later, second aspiration: no anaesthesia: 5 c.cm. of sterile pus which inhibited growth of *Staphylococci* to a distance of 4.5 mm. 5,000 units again injected. Result:—Abscess pointed 2 days after starting treatment. Discharged profusely and healed rapidly. Patient was afebrile in 3 days; home in 6 days.

Case 4.—Aged 25. Breast abscess following lactation. Child 3½ weeks old. Breast had been uncomfortable for 2 weeks and a lump had gradually appeared. Four days before admission the lump looked yellow, and the whole breast was painful. Two days later the abscess burst; the pain got worse, and on admission was radiating to the axilla and the arm. Treatment:—Aug. 10, 1943: 6 c.cm. of pus aspirated from the abscess and 10,000 units of penicillin injected. Aug. 12: 8 c.cm. of pus aspirated and 10,000 units of penicillin injected. 9 mm. inhibition. Aug. 13: Under local anaesthesia incision of abscess and drainage of 10 c.cm. of pus. This pus produced an 8-mm. zone of inhibition, and on a blood-agar plate grew only 8 colonies of *Staph. aureus*. Aug. 27: Breast-feeding discontinued. Aug. 31: Under general anaesthesia—incision and drainage of a large retromammary abscess. The pus from this gave a profuse growth of *Staph. aureus* on blood agar, and failed to produce any zone of inhibition. Sept. 12: Wound healing well. Sept. 14: Breast healed; patient discharged. Result:—The patient was febrile until the retromammary abscess was drained on Aug. 31, after 23 days in hospital, and was discharged after 37 days in hospital. Local treatment and the effort to maintain breast-feeding were a failure.

Case 5.—Aged 19. Breast abscess after ceasing to feed baby 6 weeks old. Lump in breast noticed for 3 weeks; increased recently. Abscess involving about one-quarter of breast. Treatment:—July 11, 1943: Under local anaesthesia 3 c.cm. of pus aspirated and 4,000 units of penicillin injected. Forty-eight hours later, 3 c.cm. of pus aspirated, which was sterile and gave a 1-mm. zone of inhibition. 6,000 units again injected. Result:—Three days after onset of treatment abscess pointed and discharged. Patient was afebrile on third day and home on sixth.

Case 6.—Aged 22. Breast abscess following lactation. Child 5 months old. Eight days before admission lump appeared in right breast. Disappeared after three days. Three days before admission lump reappeared and became painful. Treated as an out-patient with kaolin poultices. On admission she had a breast abscess 2½ in. in diameter above the right nipple. Treatment:—Nov. 10, 1943: Aspiration of 10 c.cm. pus; 10,000 units penicillin injected. Nov. 12: Aspiration of 10 c.cm. pus (this pus inhibited standard staphylococci to 11 mm.); 8,000 units injected. Nov. 14: Aspiration of 10 c.cm. pus; 7,000 units injected. Nov. 16: Aspiration of 7 c.cm. pus (this pus inhibited standard staphylococci to 6 mm.); 10,000 units injected. Nov. 18: Aspiration of 4 c.cm. pus. Nov. 20: Cured. Result:—The patient was 9 days in hospital, and afebrile on the third day after starting treatment.

Case 7.—Blind primipara aged 27. Had staphylococcal paronychia at delivery, Sept. 25, 1943. Early in puerperium marked breast engorgement, which went on rapidly to development of bilateral breast abscesses involving most of both breasts. Oct. 14: Aspiration, and penicillin replacement under pentothal. 60 c.cm. pus right—15 c.cm. pus left; 15,000 units of penicillin to each side. Oct. 16: Right, 15 c.cm. pus; 16,000 units of penicillin. Left, 4 c.cm. pus; 8,000 units. Oct. 18: Right, 50 c.cm. pus; 8,000 units. Left, 30 c.cm. pus; 6,000 units. Both breasts then broke down and freely drained through a small hole at the site of aspiration. The right rapidly resolved, and cleared up entirely. She was allowed home on Nov. 14 with sinus discharging in left breast. This had not cleared up by Dec. 24, so she was readmitted and the sinus opened up under anaesthesia, with removal of sloughs. Result:—On Jan. 20, 1944, after three months, the right breast texture was normal, the left still slightly indurated.

Case 8.—Para-5 aged 39. Had had breast abscesses after third and fourth children; also small areolar abscess in this pregnancy. Always same breast affected. On tenth day of puerperium admitted with segmental mastitis. 3 c.cm. of penicillin injected under local anaesthesia into affected area. Increased tension caused consider-

ble pain, but breast improved for a few days, only to develop a large abscess, which was incised on Nov. 28, with removal of 80 c.cm. of pus; 8,000 units were left in drainage wound. Abscess occluded, and required counter-drainage on Dec. 2, after which she made good recovery. Home after 23 days in hospital.

The patient should not have been encouraged to feed from a breast deformed by past infection and incisions. Prophylactic penicillin found impracticable, and useless locally. Incision was resorted to in order to secure efficient drainage of a deep-seated abscess.

**Case 9.**—Aged 23. Breast abscess after lactation. Child 3 weeks old. Breast-feeding stopped, as supply insufficient. Patient admitted with abscess involving two-thirds of breast that had been developing over a period of three weeks. A small superficial abscess had been treated by surgical drainage a fortnight before. Considerable induration of the deeper tissues of the breast was noticed at the time. **Treatment:**—On July 17, 1943, the patient came under our care. On the 18th 5 c.cm. of pus was aspirated under local anaesthesia and 15,000 units of penicillin were injected. Twenty-four hours later there was free spontaneous drainage at site of the old incision—pus inhibiting standard staphylococcus to 3 mm. Twenty-four hours later 6,000 units injected, and three days later 8,000 units into indurated area. **Result:**—The patient was 10 days in hospital—afebrile after 7 days.

**Case 10.**—Aged 29. Breast abscess complicating scabies, which she had had for some weeks. Induration developed in the breast about a week previously. When seen she had an intramammary abscess involving two-thirds of the breast. **Treatment:**—20 c.cm. of pus aspirated under local anaesthetic and 15,000 units of penicillin replaced. Forty-eight hours later 4 c.cm. of pus aspirated with difficulty; this inhibited a growth of staphylococci 11.5 mm. 15,000 units replaced. Forty-eight hours after second injection abscess further localized and pointing on the surface. Incision and drainage done under pentothal; 4 to 5 oz. of pus evacuated. This pus inhibited standard staphylococcus to 5 mm. There was rapid resolution after efficient drainage. **Result:**—Patient was afebrile 7 days from onset of treatment and returned home in 12 days.

**Case 11.**—Aged 35. Seen in post-natal clinic at 10 weeks, with slight induration in right areola. One week later (Oct. 18, 1943) there was a small superficial abscess: 1 c.cm. of pus aspirated; 4,000 units of penicillin injected. Oct. 20: 1 c.cm. of pus aspirated; 3,000 units injected. Breast-feeding continued. The breast settled down, and she was allowed home on Oct. 22. She returned on Oct. 26 with mastitis involving whole breast which developed overnight. Breast-feeding abandoned. The abscess was incised and drained on Oct. 28; no penicillin was used. The breast slowly resolved, the patient being very ill for a fortnight, and, as a sinus persisted, penicillin was injected down it. On Nov. 22 and 23, 8,000 units; on Nov. 25, 2,000 units were given, but no improvement was noticed, and on the 26th the sinus was explored under general anaesthesia and a slough  $2\frac{1}{2}$  by  $1\frac{1}{2}$  in. removed. The wound was drained, and 8,000 units of penicillin injected down the tube. The breast rapidly resolved, and was healed by Dec. 1.

In this case an attempt to maintain breast-feeding in presence of breast abscess was a failure: the inefficiency of local aspiration treatment if there is a slough in the depth of the abscess is also illustrated.

**Case 12.**—Aged 22. Breast abscess following lactation. Child 7 weeks old. Eight days before admission painless lump in left breast. Three days later lump became painful and red, and was treated with kaolin poultices and hot bathing. On admission she had a fluctuating breast abscess 3 by  $2\frac{1}{2}$  in. on the outer aspect of the left breast. Nov. 12, 1943: Under local anaesthesia 9 c.cm. of pus aspirated and 10,000 units of penicillin injected. Nov. 14: Several discharging sinuses on under surface of abscess; induration less; 6,000 units injected at site of original injection. Nov. 20: Sinuses beginning to heal; no discharge or induration. **Result:**—The patient was 7 days in hospital, and afebrile the day after the first injection of penicillin.

**Case 13.**—Aged 35. Developed a segmental mastitis when her baby was 8 weeks old. Baby kept at breast and condition resolved with local treatment, to recur one week later with development of small peripheral abscess. Nov. 14, 1943: Aspiration 1 c.cm. pus; 4,000 units penicillin injected. Nov. 16: Aspiration 1 c.cm. pus; 4,000 units injected. Nov. 18: Aspiration nil; 4,000 units injected. **Result:**—The abscess discharged spontaneously; patient returned home on Nov. 23 with breast healed and lactation still well established.

**Case 14.**—Aged 30. Breast abscess following weaning at 9 months; case first seen with segmental mastitis on Oct. 27, 1943. Stilboestrol and local heat given. Six days later afebrile, but local abscess: 10 c.cm. of pus aspirated; 20,000 units of penicillin injected. Nov. 7: Admitted for aspiration-replacement treatment; doses were 20,000, 8,000, 8,000, and 8,000 units, given on Nov. 7, 9, 11, and 13 respectively. **Result:**—Condition underwent slow resolu-

tion without breaking down. There was still slight induration Nov. 20.

**Case 15.**—Para-7 aged 45, first admitted on fourteenth day puerperium with mastitis, which resolved with local treatment, abandoning of breast-feeding. Patient went home after 7 days return with abscess. Jan. 13, 1944: Aspiration 3 c.cm. pus; 4 units penicillin. Jan. 15: Aspiration 5 c.cm. pus; 4,000 units. **Result:**—Spontaneous discharge from aspiration site, with satisfactory resolution.

### Comment

These cases fall into three groups. In 5 cases surgical drainage was necessary, and conservative treatment may be said to have failed. In 7 cases spontaneous drainage occurred either at a puncture site or elsewhere, and in only 3 did the abscess remain closed and resolve slowly with no evacuation of its contents except by aspiration. On the other hand, the cases in both the second and third groups required no operative or anaesthetic, and their recovery was on the whole more rapid than is usual with simple drainage.

It is possible that some other method of local treatment may give better results, and, in view of the fact that aspiration sometimes cannot sufficiently evacuate the contents of the abscess, surgical drainage followed by instillation of penicillin solution through an indwelling catheter is being used in a further series. When larger supplies of penicillin become available a trial should be made of systemic treatment at an earlier stage in order to control the inflammatory process before suppuration has occurred, and so permit the continuation of breast-feeding.

## PENICILLIN IN TREATMENT OF CERTAIN DISEASES OF THE SKIN

BY

I. A. ROXBURGH, M.B., B.Ch.

RONALD V. CHRISTIE, M.D., D.Sc., F.R.C.P.

AND

A. C. ROXBURGH, M.D., F.R.C.P.

The unique properties of penicillin as an antiseptic suggested that it might be of value in the treatment of some diseases of the skin. This seemed a suitable field of inquiry for two further reasons: first, the probability, from bacteriological principles, of a good response from some of the pyogenic infections of the skin; and, secondly, the likelihood of comparatively small amounts of penicillin being required.

The present survey comprises 75 cases. These were all in-patients, and it was thus possible closely to supervise the treatment, which was by local application alone. All cases were investigated bacteriologically before treatment was begun, and the penicillin-sensitivity of the organisms present was qualitatively determined. Unless otherwise stated, the bacterial flora described as being present was, to a greater or lesser degree, penicillin-sensitive. The number of units used in each case should be regarded as only approximate, and was often related to the extent of the disease rather than to its severity. The word "cure" is used in this paper to imply complete healing of lesions at some particular time. It does not necessarily mean a permanent eradication of the disease.

### Sycosis Barbae (15 Cases)

This was chosen as a suitable disease for preliminary investigation because it so often fails to respond adequately to other methods of therapy. Crusts, if present, were removed before penicillin was applied, and shaving was discouraged, especially in the early stages of treatment. Penicillin was usually applied as an ointment containing 400 units of calcium or sodium penicillin per gramme of base, the latter being a mixture of equal parts of lanette wax S.X., petroleum jelly and water. In a few cases the strength used was 200 units per g., and in some the base contained 50% of water with 25% of each of the other ingredients. It was felt that if the base contained 50% of water it might be of more suitable consistency, but this did not prove to be so. In other cases solutions of penicillin were used.

**Case 1.**—M., aged 31. Duration of disease 11 years. X rays, vaccines, sulphonamides, quinoline, and other local applications had produced only temporary improvement. Numerous small pustules over whole beard area. Organisms, *Staph. aureus*. 12,800 units (calcium salt in lanette base, 200 units per g.) in 16 days. Daily applications to worse side (left) only. Right side similarly treated with lanette base without penicillin. Result was apparent cure on left, very slight improvement on right. Followed by 16,800 units to both sides in 18 days, with apparent cure. A few pustules reappeared 2 weeks later. Three weeks after end of treatment he was sent a further 12,000 units, which he applied during the ensuing 5 weeks. This produced complete cure, which has now lasted 22 weeks.

**Case 2.**—M., aged 46. Duration 6 years. Temporary improvement only with x rays, vaccines, sulphonamides, quinoline, and brilliant green. Extensive crusting of whole beard area and neck and eyebrows. Organisms, *Staph. aureus*. 17,000 units (calcium salt in lanette base (50% water), 200 units per g.) in 17 days. Daily applications to worse side only (left). Base only to right side. Marked improvement on left side; rather less marked improvement on right. Then 9,000 units to both sides in 7 days. Both sides cured. A very mild relapse occurred 5 weeks later. This was not treated. Sixteen weeks after treatment ended he was seen to have a very few small spots, but rather a severe blepharitis. This was cured by the application of 12,000 units in 2 weeks; but by then a few pustules had appeared on the face. These were cured by a further 12,000 units, and the cure has now lasted 9 weeks.

**Case 3.**—M., aged 49. Duration 7 years. Temporary improvement only with x rays, sulphonamides, and numerous local applications. Slight crusting. Organisms, *Staph. aureus*. 4,100 units (calcium salt in lanette base (50% water), 200 units per g.) in 20 days. Daily application to worse side only (left). Result: great improvement on left side. Then 5,600 units to both sides in 14 days. Both sides cured. Slight relapse 10 days later. Five weeks after stopping treatment he was given a further 12,000 units, and responded well. Now cured for 14 weeks.

**Case 4.**—M., aged 41. Duration 2 years. Temporary improvement only with x rays, quinoline, and other local applications. Lesions most prominent on cheeks and upper lip. Organisms, *Staph. aureus* and *Strep. pyogenes*. 8,000 units (calcium salt in lanette base (50% water), 400 units per g.) in 8 days. Daily applications to left side only. Great improvement. Then 34,000 units to both sides in 17 days. Both sides cured. No relapse after 19 weeks.

**Case 5.**—M., aged 29. Duration 3 years. Temporary improvement only with x rays, sulphonamides, and other local applications. Infection confined to upper lip and eyelids. Organisms, *Staph. aureus*. 4,600 units in 23 days. Calcium salt in lanette base. 200 units per g., applied daily to upper lip. Solution of calcium salt (500 units per c.c.m.) as eye drops (2 drops into each eye 2-hourly by day) and ointment applied to lids at night, for 5 days. Blepharitis cured, upper lip almost so. Used a further 3,000 units during next 2½ weeks, and was then seen to be cured. Slight return of crusting on the upper lip 15 weeks later. When this had been present one week he was given quinoline emulsion for the next week, and during the subsequent 2 weeks used a further 12,000 units of penicillin. He was then seen to have relapsed almost completely, with some return of the blepharitis. Ointment appeared to be irritating the lesion.

**Case 6.**—M., aged 22. Duration 4 months. Temporary improvement with x rays, ultra-violet light, sulphonamides, brilliant green, crystal violet, etc. Scattered lesions over whole beard area. Organisms, *Staph. aureus*. 7,500 units (sodium salt in lanette base, 400 units per g.) in 30 days. Applications daily for 11 days, then twice daily. Complete cure: has now lasted 16 weeks.

**Case 7.**—M., aged 22. Duration 3 years. Temporary improvement only with local applications and x rays. Lesions extensive; blepharitis present. Complicated by seborrhoeic dermatitis. Organisms, *Staph. aureus*. 11,340 units (sodium salt in lanette base, 400 units per g.) in 21 days (applied twice daily). Improvement till 11th day, then complete relapse, so that face was "worse than ever before." Further slight improvement just before treatment was stopped. Culture from a pustule at this stage showed that the organism had increased its resistance to penicillin. Given x rays (50 r twice) with some improvement. Two weeks later a second course, using solution of calcium penicillin (1,000 units per c.c.m.), was started. 38,410 units in 15 days. Face sprayed 4 times daily (right side only for first 7 days). After this both sides seemed to be cured. Solution then applied to eyes (2 drops into each, 4 times daily), 22,470 units being given in 21 days. Blepharitis cured a few days before treatment was stopped. Face began to relapse only a few days after treatment to the eyes was finished. After 2 weeks there was a return of the blepharitis. Condition was stationary for the next 6 weeks under treatment with pyrogallol in zinc cream.

**Case 8.**—M., aged 40. Duration 2½ years. No response to quinoline, nasal operations, x rays, or sulphonamides. Infection of

skin localized to upper lip and eyelids, but chronic purulent nasal discharge present. Organisms, *Staph. aureus* and *Strep. pyogenes*. 11,970 units (sodium salt in lanette base, 400 units per g.) in 21 days (applied twice daily). Gradual improvement for 15 days, then complete relapse. Organisms showed some increase in resistance to penicillin. Quinoline emulsion and x rays produced some improvement during next 2 weeks. Second course then started. 118,750 units (solution of calcium salt, 1,000 units per c.c.m.) in 19 days. Solution sprayed on to upper lip and up nose 4 times daily. Improvement for 11 days, then complete relapse; the solution appeared only to irritate the lesions.

**Case 9.**—M., aged 38. Duration 2½ years. Sulphonamides and local applications ineffective. Scattered lesions, associated with seborrhoeic dermatitis. Organisms, *Staph. aureus*. 5,600 units (sodium salt in lanette base, 400 units per g.) in 8 days (applied twice daily). Complete cure. Relapse began after 2 weeks and became severe after 4 weeks. Treated by 49,950 units (solution of calcium salt, 1,000 units per c.c.m.) in 15 days. Sprayed on twice daily. Complete cure. Relapse after 5 days. Seen 6 weeks later, the condition was not severe, although he had had no further treatment.

**Case 10.**—M., aged 31. Duration 3 years. Only temporary improvement with x rays and local applications. Lesions worst on chin and forehead. Some crusting. Organisms, *Staph. aureus*. 17,625 units (calcium salt solution, 1,000 units per c.c.m., and in lanette base, 400 units per g.) in 14 days. Sprayed 4 times daily for 3 days, then twice daily. Ointment only for last 2 days. Almost cured. Cure completed after application of a further 6,000 units in 2 weeks. Began to relapse a few days later. During 2nd and 3rd weeks after start of relapse he used another 12,000 units, but the ointment only irritated his skin, and no progress was made.

**Case 11.**—M., aged 32. Duration 3 months. Sulphonamides and other local applications ineffective. Organisms, *Staph. aureus*. 24,970 units (sodium salt in lanette base, 400 units per g.) in 27 days (applied twice daily) produced complete cure. Relapsed a few days later. Eight weeks later his condition was not severe, though other methods of treatment had been employed in the interval.

**Case 12.**—M., aged 47. Duration 2½ years. All local applications ineffective. Lesions scattered over beard area, but mostly in midline. Organisms, *Staph. aureus*. 139,860 units (solution of calcium salt, 1,000 units per c.c.m.) in 28 days. Sprayed thrice daily. Complete cure. There was minimal improvement for the first 5 days, but cure was almost complete after 18 days.

**Case 13.**—M., aged 27. Duration 5 years. Only temporary improvement with numerous local applications, 2% crystal violet being the most useful. Severe crusting of upper lip; eyelids and left eyebrow also affected. Chronic sinusitis. Organisms, *Staph. aureus*. 67,190 units (solution of calcium salt, 1,000 units per c.c.m.) in 15 days. Sprayed on thrice daily. There was a gradual but steady improvement. Had to be discharged for domestic reasons, and was given 12,000 units as ointment with which to continue treatment.

**Case 14.**—M., aged 23. Duration 1½ years. Recent exacerbation. Temporary improvement with quinoline emulsion. Generalized rash all over beard area: some impetiginous lesions also. Organisms, *Staph. aureus*. 50,000 units in 15 days. Solution of calcium salt sprayed on thrice daily. Complete cure, which has now lasted one week.

**Case 15.**—M., aged 21. Duration several months. Only temporary improvement with quinoline emulsion. Generalized rash, but predominant on chin. A few impetiginous lesions present. Organisms, *Staph. aureus* and *Strep. pyogenes*. 40,920 units in 12 days. Solution of calcium salt sprayed on thrice daily. Complete cure.

#### Commentary

In judging these results it is necessary to remember that most of the cases were chosen for the very reason that they were of long duration or had notably failed to respond to ordinary methods of treatment.

Analysis of results shows that: (a) Five cases (Nos. 4, 6, 12, 14, 15) were initially cured and have remained so. These cures have lasted for periods up to 19 weeks. (b) Three cases (Nos. 1, 2, 3), though initially cured, relapsed after periods varying from 10 days to 5 weeks. Their relapses were cured, and cures have now lasted for periods varying from 9 to 22 weeks. (c) Five cases (Nos. 5, 7, 9, 10, 11), though initially cured, relapsed after periods varying from a few days to 15 weeks, and their relapse remains uncured. (d) One case (No. 8) was never cured. In one case (No. 13) treatment is still in progress.

The remarkable initial response in the first 6 cases which we treated was perhaps unfortunate, as it led to false confidence in the method of application. It became clear subsequently that the ointment used could in some cases lead to irritation of the skin, though which constituent of the

ointment was responsible is not at present clear. The comparative impurity of present supplies of penicillin must be remembered as a possible cause. Further investigations on methods of application are clearly indicated, but even if the ideal method is found it still appears that recurrences in some cases may be frequent. The tendency of cases of sycosis barbae to relapse after apparent cure is well known, and there is no reason to suppose that penicillin can abolish this inherent tendency. The most to be expected of penicillin is, that it may cure established infection or, if applied prophylactically, prevent reinfection. Established infection was indeed cured, though sometimes only temporarily, in all but one of this series. In the exception (Case 8), failure was probably due to a continual reinfection from the nasal discharge. It may be noted here, in connexion with associated disease, that all three patients who also suffered from seborrhoeic dermatitis relapsed within 14 days of cure.

The significance of the increase in resistance to penicillin displayed by the organisms in Cases 7 and 8 is doubtful; this also requires further elucidation. The use of solution is not recommended except perhaps in cases irritated by the ointment, as it tends to be extravagant of penicillin and does not appear to produce final cure any more quickly. There is sometimes, however, a more dramatic response during the first few days. Twice-daily spraying is probably adequate. The solution seemed to irritate the skin in Case 8.

Treatment should in all cases be continued for a few days after apparent cure; in our cases penicillin was probably stopped earlier than was desirable, owing to the need for economy in its use. When it becomes freely available it should be possible to start treatment at the first signs of a relapse or even to use penicillin prophylactically.

This series is a small one, and further experience may show that we have been unduly fortunate in our results. Even if this proves to be the case, it is clear that, while penicillin can by no means be relied upon to produce a lasting cure in all cases of sycosis barbae, it can in individual cases produce results unobtainable by any other means. If only for this reason, it has a definite place in the treatment of the disease.

#### Impetigo (12 Cases)

Some of these were primary impetigo and others were secondary to disease such as scabies. All were treated by removal of crusts followed by local application of sodium or calcium penicillin in the lanette wax and petroleum jelly base, 400 units per g.

**Case 1.**—M., aged 7. Duration 7 days. Upper lip, cheeks, and backs of hands predominantly affected. Organisms, *Strep. pyogenes*. 1,800 units in 9 daily applications. Single lesions healed in 2 to 3 days; cure complete in 9 days.

**Case 2.**—M., aged 19. Duration 20 days. Extensive crusting of face, ears, arms, buttocks, and thighs. Organisms, *Strep. pyogenes* and *Staph. aureus*. 8,505 units in 21 daily applications. Only one area was treated at a time, so final cure was delayed; individual areas were cured after 4 to 6 days' treatment.

**Case 3.**—F., aged 4. Duration 11 months. Associated with seborrhoeic dermatitis, and affecting scalp and ears. Organisms, *Strep. pyogenes* and *Staph. aureus*. 18,900 units in 21 daily applications. Rapid improvement for 10 days; condition then became stationary. The improvement coincided with elimination of the secondary infection, the seborrhoeic dermatitis being unaffected by further treatment.

**Case 4.**—M., aged 1. Duration 5 weeks. Associated with scabies, and affecting face and ears. Organisms, *Strep. pyogenes* and *Staph. aureus*. 2,800 units in 11 days (applied twice daily). Single lesions healed in 3 to 4 days; cure complete in 11 days.

**Case 5.**—M., aged 10. Duration 10 days. Face only affected. Organisms, non-haemolytic streptococci and *Staph. aureus*. 3,960 units in 9 days (applied twice daily). Single lesions healed in 4 days; cure complete in 9 days.

**Case 6.**—M., aged 4. Duration 12 days. Face, ears, and legs. Organisms, *Strep. pyogenes*. 14,000 units in 8 daily applications. Single lesions healed in 3 days; cure complete in 8 days.

**Case 7.**—F., aged 6 months. Duration 14 days. Associated with seborrhoeic dermatitis and scabies, and affecting scalp, trunk, and limbs. Organisms, *Staph. aureus*. 16,560 units in 6 daily applications. Complete cure of impetigo. Relapsed after 15 days. Cured by application of 7,360 units in 8 days.

**Case 8.**—F., aged 5. Duration 3 weeks. Associated with scabies, and affecting lower limbs. Organisms, *Strep. pyogenes* and *Staph.*

*aureus*. 12,000 units in 8 days (applied twice daily). Single lesion healed in 5 days; complete cure in 8 days.

**Case 9.**—M., aged 37. Duration 12 days. Extensive crusting of face. Organisms, *Staph. aureus*. 24,000 units in 12 daily applications. Great improvement in 5 days; cure complete in 12 days.

**Case 10.**—M., aged 24. Duration 14 days. Scalp, neck, and forearms affected. Organisms, *Staph. aureus*. 11,960 units in 12 days (applied twice daily). Scalp cured in 4 days; other areas require 12 days.

**Case 11.**—M., aged 27 years. Duration 10 days. Face, scalp, arms. Conjunctivitis and blepharitis. Organisms, *Staph. aureus* and diphtheroids. 8,170 units in 19 daily applications to face, scalp and arms. (Eyes also treated—see "Blepharitis," Case 5.) Almost well in 5 days, but even by the 19th day a few new lesions were appearing.

**Case 12.**—F., aged 3½ months. Duration several weeks. Scalp, face, and hands, affected. Underlying eczema of scalp and face. Organisms, haemolytic streptococci. 24,000 units in 15 daily applications. Impetigo cured in 5 days; 10 days' further treatment had no beneficial effect on the eczema.

#### Commentary

It will be seen that of 12 cases treated 11 were completely cured. The important factor is the time required to produce this result: on an average this was 8 to 9 days. Most of these patients, however, were in a fairly advanced condition when treatment was started, and as ointment was applied only in the immediate neighbourhood of the lesions it was difficult to prevent spread to unaffected areas. Individual lesions under treatment healed in about 4 days.

Minor variations in the routine of treatment do not seem to be of much importance: for instance, one application of ointment a day appears as effective as two. But when penicillin becomes more easily obtainable it may be possible, by spreading it more widely, to prevent formation of new lesions and materially accelerate complete cure.

We consider that penicillin can be more generally relied upon to produce a rapid cure than can quinoline emulsion or sulphonamides, though these drugs may in individual cases be equally successful.

In view of discussions regarding the bacteriology of impetigo it is worth noting that in these 12 cases the infecting organisms were: in 3 cases, *Strep. pyogenes* alone; in 3 cases, *Staph. aureus* alone; in 4 cases, *Staph. aureus* and *Strep. pyogenes*; in 1 case, *Staph. aureus* and non-haemolytic streptococci; in 1 case, *Staph. aureus* and diphtheroids.

#### Eczema (9 Cases)

For the most part the patients treated were resistant cases of chronic eczema in which it seemed that elimination of secondary infection might aid recovery. All were treated with sodium or calcium penicillin in the lanette wax and petroleum jelly base, 400 units per g.

**Case 1.**—M., aged 27. Duration several weeks. Large raw areas on hands, forearms, face, and ears, resistant to all previous treatments. Organisms, *Staph. aureus*. 29,070 units in 21 daily applications. Notable improvement, patient being left with a residual dry eczema, which responded to ordinary methods of treatment.

**Case 2.**—F., aged 67. Duration 10 days. Severe weeping eczema of wrists and hands with purulent blisters. Organisms, *Strep. pyogenes* and *Staph. aureus*. 16,000 units in 13 days to right hand only (applied twice daily). Left side treated with zinc cream. Right hand cured after 11 days, left after 13 days.

**Case 3.**—M., aged 35. Duration 6 months. Dry scaly eczema of face, neck, and ears with fissuring. Organisms, *Strep. pyogenes* and *Staph. aureus*. 39,200 units in 7 daily applications to right side only. Great improvement after 3 days, whereupon base alone was applied to left side. This resulted in similar but less rapid improvement. Subsequent application of base without penicillin to both sides effected cure, but relapse occurred a few weeks later.

**Case 4.**—M., aged 20. Duration 4 days. Vesicular eczema of left index, with pustules on rest of hand. Organisms, *Staph. aureus*. 24,000 units in 10 daily applications. No improvement in eczema.

**Case 5.**—M., aged 23. Duration 16 years. Generalized eczema with fissures. Organisms, *Staph. aureus* and another Gram-positive coccus. 36,000 units in 20 days (applied twice daily) to face and neck only. Fissures healed. Otherwise unaffected.

**Case 6.**—M., aged 2½. Generalized infantile eczema dating from birth. Organisms, *Strep. pyogenes* and *Staph. aureus*. 30,100 units in 22 days (applied twice daily). No change for 5 days; thereafter



steady improvement. Began to relapse 2 to 3 days after treatment stopped.

Case 7.—M., aged 25. Duration 3 weeks. Face predominantly affected. Sterile on culture. 6,000 units in 15 daily applications. Cured.

Case 8.—M., aged 8 months. Duration 4½ months. Scalp and left cubital fossa. Organisms, *Strep. pyogenes* and *Staph. aureus*. 12,040 units in 14 daily applications. Improved for 5 days, then relapsed. (Prevention of scratching was very difficult.)

Case 9.—M., aged 58. Duration 8 months. Large raw weeping patch below the knee. Organisms, *Staph. aureus* and *Strep. pyogenes*. 71,810 units in 22 days (applied twice daily). Healed; only a residual redness persisted.

#### Commentary

Cases 3 and 7 suggest that such improvements as occurred in this series were possibly due to the lanette base rather than to penicillin. There is little doubt, however, that in Cases 1 and 9 the dramatic improvement was the result of controlling the infection, and the limited success in Cases 5 and 6 is in agreement with this. Penicillin should be worthy of trial in cases of eczema with evidence of secondary infection.

#### Blepharitis (8 Cases)

This condition has been mentioned in connexion with sycosis barbae; the cases now to be described were, however, not accompanied by sycosis. They were treated by application of sodium salt in lanette wax and petroleum jelly base, 400 units per g., to the lids, or by instillation of solution of sodium or calcium penicillin into the eye. All cases were bilateral. The results of treatment are in general agreement with those obtained by Florey and Florey (1943).

Case 1.—F., aged 3. Duration 5 months. Eyebrows also infected. Organisms, *Neisseria catarrhalis*, *Strep. pyogenes*, and *Staph. aureus*. 1,640 units (ointment) in twice-daily applications for 3 days. Cured. Relapsed after 10 days. 2,870 units in twice-daily applications for 7 days. Cured. Relapse after 3 weeks. *Staph. aureus* found to be less sensitive than previously. 6,000 units in daily applications for 15 days. Cured in 10 days. Slight relapse about 3 weeks later. When seen 8 weeks after treatment was stopped the right eye showed a mild blepharitis and the left appeared cured. The only treatment had been local application of petroleum jelly.

Case 2.—M., aged 35. Duration 28 years. Organisms, *Staph. aureus*. 5,800 units (sodium salt in saline, 500 units per c.c.m.) in 10 days. Two drops 2-hourly by day into left eye only, for 6 days. Great improvement in left eye. Then both sides treated. Cure in 10 days. Relapsed after a few weeks.

Case 3.—F., aged 30. Duration 2½ years. Seborrhoeic dermatitis present. Organisms, *M. tetragenus* and *Staph. aureus*. 1,400 units in daily applications for 7 days. Cured.

Case 4.—M., aged 22. Duration 3½ years. Bilateral conjunctivitis. Organisms, *Staph. aureus*. 8,920 units in 12 days. Two drops of sodium salt solution in saline (500 units per c.c.m.) into each eye 2-hourly by day. Ointment also applied to lids nightly, but discontinued owing to intense irritation produced. Thereafter solution was applied to lids on a swab instead. Complete cure, which has now lasted 11 weeks.

Case 5.—M., aged 27. Duration 9 days. Impetigo and conjunctivitis also present. Organisms, *Staph. aureus* and diphtheroids. 3,800 units (ointment) in daily applications over 19 days. Cured. (Impetigo also treated—see "Impetigo," Case 11.)

Case 6.—M., aged 26. Duration 14 years. Organisms, *Staph. aureus*. 8,000 units (solution of calcium salt, 1,000 units per c.c.m.)—2 drops 2-hourly by day into each eye in 5 days. Cured. Has now remained cured for 9 weeks.

Case 7.—F., aged 43. Duration 3 weeks. Associated with pemphigus vulgaris. Organisms, *Staph. aureus*. 2,340 units in twice-daily applications for 5 days (ointment). Cured. Relapsed after 10 days. 6,500 units in 13 days. Cured. Seven weeks later there was only a slight residual redness of the lids (but the pemphigus had also improved).

Case 8.—M., aged 32. Duration 2 weeks. Organisms, *Staph. aureus*. 3,150 units in twice-daily applications of ointment over 9 days. Cured. Slight relapse 6 days later. 2,800 units applied in 8 days. Cured. No relapse when seen 7 days later.

#### Commentary

Previous experience with conjunctivitis has led us to expect that solution of sodium salt in saline (500 units per c.c.m.) would be less irritant to the eye when used as drops than aqueous solution of calcium salt (1,000 units per c.c.m.). Patient No. 6, however, did not find the latter uncomfortable, and it seems that individuals vary in their tolerance. The

application of ointment to the lids was not usually productive of any reaction, though in Case 4 it did produce a marked aggravation of the blepharitis.

Blepharitis being generally extremely resistant to treatment, the initial response of these cases is most encouraging. The frequency of relapse is at present a disappointing feature, but when supplies of penicillin are better it may be possible to prevent relapse by, for example, a nightly application of the drops.

#### Otitis Externa (7 Cases)

These cases were treated by sodium penicillin in lanette wax and petroleum jelly base (400 units per g.) or by solution of calcium penicillin (1,000 units per c.c.m.). Where the solution was used, drops were introduced into the external meatus thrice daily, and it was then plugged with cotton-wool or petroleum jelly gauze.

Case 1.—M., aged 45. Bilateral. Duration 7 months. Organisms, *Staph. aureus*, diphtheroids, coliforms, and an unidentified Gram-positive coccus. 36,870 units (solution) in 7 days. After 5 days there was an improvement, and sensitive organisms were no longer present. Before treatment was finished, however, there was a relapse.

Case 2.—M., aged 56. Bilateral. Duration 2 years. Organisms, diphtheroids, coliforms, and *B. proteus*. 89,665 units (solution) in 22 days (twice daily only during final 7 days). Number of sensitive organisms diminished, but there was only improvement—not cure. Nineteen weeks later his improved condition was still being maintained.

Case 3.—M., aged 41. Right side only. Duration 35 years. Organisms, *Staph. aureus*, diphtheroids, and coliforms. 18,765 units in 8 days (solution). No sensitive organisms after second day. Cured in 5 days; relapsed 5 days later.

Case 4.—F., aged 23. Bilateral. Duration 5 months. Organisms, *Staph. aureus* and coliforms. 6,000 units in 22 days (ointment, applied twice daily). Complete cure. Discharged to use another 6,000 units. No relapse reported after 10 weeks.

Case 5.—M., aged 31. Bilateral. Duration 1½ years. Organisms, streptococci, *Staph. aureus*, *B. proteus*, and diphtheroids. 74,000 units in 14 days (solution twice daily only for last 5 days). Clinical cure by 5th day, but bacteriology still unaltered by 10th day.

Case 6.—M., aged 39. Bilateral. Duration 14 months. Organisms, *Staph. aureus*, *Strep. faecalis*, diphtheroids, and coliforms. 3,000 units in 15 daily applications of ointment. Cured. Relapsed 17 days later. A more resistant collection of organisms found. 6,000 units in 22 daily applications. Improvement but no cure.

Case 7.—M., aged 25. Bilateral. Duration 3 weeks. Organisms, *Staph. aureus* and coliforms. 6,000 units in 15 daily applications of ointment. Cured.

#### Commentary

These infections have all been mixed; and without exception part of each flora has been insensitive to penicillin. The incidence of incomplete cures and early relapses is therefore not surprising. Ointment is a simpler and more economical method of treatment than the solution, and appears to be equally effective.

#### Boils (5 Cases)

These were treated with sodium penicillin in lanette base, 400 units per g.

Case 1.—M., aged 31. Recurrent furunculosis of buttocks of 13 months' duration. Organisms, coagulase-negative *Staph. albus*. 21,000 units in 12 daily applications effected cure before end of treatment. Used a further 12,000 units after discharge. No relapse 12 weeks later.

Case 2.—M., aged 10. Boils on back of neck of 3 weeks' duration. Organisms, *Staph. aureus*. 4,080 units in 14 days (applied twice daily). Slight improvement only.

Case 3.—M., aged 65. Axillae chiefly affected. Duration 2 months. Organisms, *Staph. aureus*. 3,500 units in 2 daily applications. Cure, lasting now 11 weeks.

Case 4.—M., aged 15. Neck and chin. Duration 2 days. Organisms, coagulase-negative staphylococci. 6,090 units in 15 days (applied twice daily). Cured.

Case 5.—M., aged 24. Large discharging boils on buttocks. Duration uncertain (mentally defective). Organisms, *Strep. pyogenes* and *Staph. aureus*. 24,000 units in 15 daily applications. Healed. No new lesions.

#### Commentary

Patient No. 3, the only apparently spectacular cure, was recovering from existing lesions when treatment was started; the fact that no further lesions have appeared may be due to penicillin. These cases suggest that penicillin may possibly

be useful in stopping a series of recurrent boils. Probably the solution would have been more effective than the ointment, although more extravagant. Penicillin applied externally appeared to have no effect whatever on the evolution of an individual boil.

### Acne (3 Cases)

*Case 1.*—M., aged 23. Pustular acne of face, neck, chest, and back of 8 years' duration. Culture sterile. 15,000 units (sodium salt in lanette base, 400 units per g.) in 12 days (applied twice daily). Very slight improvement.

*Case 2.*—M., aged 22. Pustular acne of face, back, and chest. Duration 6 years. Organisms, *Staph. aureus*. 37,060 units (sodium salt in lanette base, 400 units per g.) in 34 daily applications to left side of back only. Improvement for first 10 days; thereafter i.s.q.

*Case 3.*—M., aged 40. Acne conglobata of 5 years' duration. Arms, chest, and back extensively affected. Organisms, *Staph. aureus*. 235,320 units in 29 days. Solution of calcium salt (1,000 units per c.cm.) was sprayed on 4 times daily. Cured. Gradual relapse began after 7 days.

### Commentary

Since greasy creams are in any event unsuitable for application to cases of acne, and since treatment in Case 3 was temporarily successful, it might have been better to use solution in Cases 1 and 2 also. The method is, however, extravagant. The value of penicillin in this condition remains uncertain. The acne bacillus is resistant to penicillin, and the response of the disease to treatment will depend presumably on the extent to which staphylococci are accountable for the suppuration in each particular case.

### Miscellaneous

The following results are recorded for the sake of completeness, but it is not possible to draw any conclusions of value from them. The ointment was used unless otherwise stated.

Two cases of generalized seborrhoeic dermatitis were treated: one failed to respond with ointment, but recovered temporarily when solution was sprayed on to affected areas; the other responded to ointment only in areas where secondary infection was marked. A third case, in which the disease was confined to the scalp, cleared up well when treated with ointment. (Staphylococcal secondary infection was present.) One small carbuncle which was discharging healed in 12 days under treatment with ointment. A case of Bockhart's impetigo accompanied by boils was improved, but the boils were hardly affected. A case of dermatitis repens (Crocker) failed to respond. Four cases of chronic ulceration of the lower limb of uncertain aetiology were all improved. Two cases of varicose ulceration were treated; one patient failed to respond, and the other, who was suffering from varicose eczema as well, was greatly benefited. One case of psoriasis, one case of herpes labialis, and one case of pemphigus vulgaris were unaffected.

### Summary

The treatment of 75 cases of skin disease by local application of penicillin is described.

The drug is of obvious value in sycosis barbae, impetigo, and blepharitis. It is also effective in some cases of chronic eczema with secondary infection and in some cases of otitis externa.

### REFERENCE

Florey, M. E., and Florey, H. W. (1943). *Lancet*, 1, 387.

*The World's Children* (published by the Save the Children Fund, 20, Gordon Square, W.C.1; 6d.) now reverts to its former character as a "journal of child care and protection considered from an international viewpoint." The more domestic news of the Fund, in whose interest the magazine is published, is relegated to an appended "Current Chronicle." International interests include an article on the United Nations Relief and Rehabilitation Administration, by Gladys Skelton. Sylvia Thompson expands her suggestion that the best war memorial would be the interchange of young people between the different countries to help to promote world understanding; and Lillian de Lissa, describing wartime care of children in the United States, stresses the eagerness of the Americans to profit by Great Britain's wartime experience in the nursery schools field. Elsa Castendyck discusses the causes of juvenile delinquency. The German system of food rationing is revealed in a table showing the provision of essential foods for various age groups of children. The effects of the war on the rising generation in Europe are seen through Swiss eyes by Dr. Georges Thélin of Geneva.

## THE LABORATORY CONTROL OF PENICILLIN TREATMENT

BY

LAWRENCE P. GARROD, M.D., F.R.C.P.

The bacteriological laboratory has very heavy duties in connexion with the clinical use of penicillin, and where cases are being treated it is strongly advisable that so much in the laboratory should be enabled to devote almost whole time to the necessary work. This work falls into three main categories: the preparation of solutions, etc., bacteriological diagnosis, and observation of the results of treatment by various *in vitro* tests.

The methods of preparing penicillin for clinical use employed in this and other present research centres are described in a forthcoming M.R.C. Memorandum, and cannot be given in detail here. Penicillin is supplied in the form of powder or tablets; solutions of various strengths have to be prepared from this, and sometimes diluted powders or creams. In the performance of this work two properties of penicillin should be constantly borne in mind. It is a very labile substance, liable easily to lose its activity under adverse conditions. It is also not an ordinary antiseptic, capable of destroying any bacteria with which it may become contaminated; on the contrary, there are many species quite unaffected by it which will not only remain alive in solutions of penicillin but may even decompose them, with consequent loss of activity. These two properties call for high standards of precaution in handling during preparation and for exceptional safeguards during subsequent use.

A refrigerator is the only suitable place to keep solutions and creams before and during use. We have also found it advisable that each patient under local treatment should have his own bottle of solution, owing to the danger of contamination in the ward: this has been known to occur by withdrawing the contents with a syringe and needle or tubing which has already been used for aspirating the lesion. Penicillin can easily become a vehicle of cross-infection, and surplus solution returned after use to the laboratory has occasionally been found grossly turbid owing to the presence of pus and living bacteria.

### Initial Bacteriological Diagnosis

Penicillin is effective only against certain bacteria, and it is therefore necessary to know the nature of the infection before embarking on treatment with any confidence in its result. In characteristic conditions having only one usual microbial cause, such as impetigo and sycosis, this may appear superfluous in routine treatment, but even here it may be advantageous, since it is advisable to know not only the species of micro-organism concerned but the sensitivity of the particular strain to penicillin; in some species, particularly staphylococci, this is variable. An exact but time-consuming method is to isolate the responsible pathogen in pure culture and inoculate broth containing various low concentrations of penicillin to determine the least which will inhibit growth. A much more rapid method, quite satisfactory for most purposes, which furnishes both a species and a sensitivity diagnosis from one primary culture, is Fleming's agar cup method. One or two circular holes are punched in a blood agar plate with a sterile cork-borer, and, after inoculation and spreading, a drop of weak penicillin solution (10 units and 1 unit per c.cm.) is pipetted into each hole. Penicillin diffuses into the surrounding medium, where its concentration varies inversely with distance from the cup; the width of the zone surrounding the cup in which no colonies appear is thus a measure of the sensitivity of the organism. In mixed cultures two zones are often evident—an inner containing no growth, and an outer containing colonies of only one more resistant species. Both for an expeditious diagnosis and for dealing with many cases this method is invaluable. The following observations on the sensitivity of different species have been made by this and other methods.

*Gram-positive Cocci.*—As previously reported by others, we have found occasional strains of otherwise typical *Staph. aureus* abnormally resistant to penicillin. This was sometimes

property of the original culture, but more often it developed during treatment, clearly owing to habituation; there was corresponding failure of clinical progress. No resistant strain of *Strep. pyogenes* or of *Pneumococcus* has been encountered. The widely varying susceptibility originally reported by the Oxford workers for both *Pneumococcus* and *Strep. viridans* is not borne out by our experience; no really resistant strain of either has been found. *Strep. faecalis* (enterococcus), on the other hand, is always highly resistant.

**Mouth Bacteria.**—Observations made mainly in connexion with work described in an earlier paper (p. 517) by Mowlem have led to the conclusion that the great majority of the very numerous bacterial species found in the mouth are penicillin-sensitive. This is of far-reaching practical importance, since it means that infections derived from or connected with the mouth are in general susceptible to penicillin treatment, just as those connected with the bowel are insusceptible owing to the prevalence there of resistant species. The flora of the mouth is highly complex and has been imperfectly studied; the following observations are therefore perforce of an elementary nature. In plates, both aerobic and anaerobic, inoculated with material from osteomyelitis of the jaw, from infected compound fractures of the jaw, and from infected gums, or with saliva, the only organisms ever found markedly resistant to penicillin as judged by the cup method have been *Moraxella albicans*, an occasional *Neisseria*, and *Haemophilus*. Whole groups of bacteria which are thus sensitive in doubtless varying but apparently adequate degrees are aerobic streptococci (including various types of *Strep. viridans*), anaerobic

**Mixed Infections.**—It has sometimes to be decided whether a mixed infection including sensitive and resistant bacteria is suitable for treatment. The latter are usually Gram-negative bacilli, and much appears to depend on whether they are active producers of penicillinase and may thus destroy the penicillin in the lesion. *Proteus* does not produce penicillinase, and combined infections by this organism and staphylococci have been treated successfully in this series; the cocci disappear, and although *Proteus* remains the condition improves, suggesting that the coccus has played the more important part in maintaining the infection. On the other hand, combined infection by a pyogenic coccus and a penicillinase-producing coliform bacillus may be quite unaffected; in one such case, the lesion being a cavity in which solution could be well retained, haemolytic streptococci persisted in undiminished numbers. That the reason for this was the destruction of penicillin by the coliform bacillus in the wound fluid was proved by repeatedly demonstrating that on withdrawal after 24 hours the penicillin content of this fluid was nil.

#### Examinations to Check the Results of Treatment

Swabs or other specimens have been obtained daily, and sometimes at longer intervals later, which were cultivated in order to follow the effect of treatment. When this is successful, immediately scantier growths are succeeded by total sterility. The results obtained in 60 miscellaneous cases treated locally are given in Table I. This includes only wounds (not skin diseases)—cases in which there was a simple infection by staphylococci or haemolytic streptococci, or both—and excludes

TABLE I.—Response to Local Treatment of Wounds

Nature of Lesion	No. of Cases	No. of Cases Infected with		Days before Negative Swab (No. of Cases)														No. of Cases developing Secondary Infection	
				Strep. pyogenes							Staph. aureus								
				Sir. pyog.	St. aur.	1	2	3-4	5-7	8-14	Failures	1	2	3-4	5-7	8-14	Failures	Ps. pyocyanea	Proteus
Superficial and accessible wounds (chiefly operations for plastic repair)	33	10	27	2	1	3	2	1	1	0	3	7	10	5	2	6	2		
Sutured wounds treated through tubes	11	4	11	2	1	—	—	—	1	1	1	2	3	1	3	4	—		
Sinuses	16	5	15	4	—	1	—	—	—	1	—	4	2	2	6	3	1		
Totals	60	19	53	8	2	4	2	1	2	2	4	13	15	8	11	13	3		

streptococci, anaerobic Gram-negative bacilli (*F. fusiformis* and many others unidentified), and various Gram-positive bacilli. The mixed and predominantly anaerobic flora often found in infections derived from the mouth is thus in general sensitive to penicillin, and the results of treatment are as would be expected from this.

**Actinomyces.**—According to the Oxford workers, *Actinomyces* is penicillin-sensitive and actinomycosis susceptible to treatment. We have examined 5 strains, determining their sensitivity by cultivation in a series of broth tubes containing falling concentrations of penicillin, an identical series being inoculated with the Oxford H strain of *Staph. aureus* as a control; the former series was incubated anaerobically for 10 days, during which time it is probable that some of the penicillin activity of the medium was lost. Two strains had approximately the same degree of sensitivity as the standard staphylococcus; they were obtained from cases of actinomycosis of the face, and both appear to have responded well to local treatment. Another, forming a much more compact and firm colony, was 8 times more resistant; the jaw lesion from which it was derived did not respond to local treatment with penicillin. A fourth strain, from a patient with thoracic actinomycosis who died of *Ps. pyocyanea* septicaemia during systemic penicillin treatment, was 4 times as resistant as the staphylococcus. The fifth strain grows normally only in concentrations tolerated by the staphylococcus, but sparsely and typically in concentrations up to 16 times greater; this case (jaw) has not been treated. The sensitivity of *Actinomyces* evidently varies, possibly to a greater extent than observations by this method reveal.

We have had no occasion to examine the sensitivity of strains of other susceptible bacteria, such as the various *Clostridia*, *B. anthracis*, and *C. diphtheriae*.

a series of cases with extensive bone involvement, such as old compound fractures (see Robertson, p. 519), in which we now know this method of treatment to be useless.

The variability of effect seen in Table I probably depends largely on the structure of the lesion, and thus on the feasibility of permeating it with penicillin completely and maintaining this condition. *Strep. pyogenes*, as would be expected from its greater sensitivity, tends to disappear earlier than *Staph. aureus*. Secondary infection with *Ps. pyocyanea* or *Proteus* often developed during treatment in these and other cases, and aroused a suspicion in some minds that penicillin not only fails to inhibit the growth of these organisms but actually stimulates it. Experiments to determine whether this is so are not complete.

#### Estimation of the Penicillin Content of Exudates

Since therapeutic effect depends on maintaining an adequate concentration of penicillin in the lesion, it is useful to know, whether this condition has been secured. If solution is being introduced into an abscess or other cavity, pus can be withdrawn before a further injection is made and its penicillin content determined. This is done by placing it in a cup in an agar plate heavily inoculated with the standard staphylococcus; growth is inhibited in a zone around the cup the width (radius) of which is a measure of penicillin concentration (concentrations of 100, 10, and 1 unit per c.cm. produce zones measuring 20, 12, and 3 mm. in width respectively).

Persistence is most regularly to be expected in closed cavities treated by aspiration and injection. This fact is illustrated by estimations of penicillin content in pus from empyemas so treated: in 14 specimens of pus withdrawn 2 days after the first injection the mean inhibition zone was 9 mm., and after 3 days (7 specimens) 7 mm. In one case pus giving a 6-mm.

zone was withdrawn 5 days after the last injection. Zones of 2 mm. have been observed after 9 and even 11 days, but their significance is doubtful, since pus containing no penicillin has been observed sometimes to produce this degree of inhibition.

Specimens of fluid from other lesions examined in this way total 192. Some of these were from abscesses treated by aspiration and injection with results comparable to those in empyema. The majority were withdrawn either from sinuses or from recent operation wounds sutured over a tube. Table II records the penicillin content in 106 such specimens; only those obtained one day after treatment are included, and others are excluded in which it appeared that penicillin was being destroyed by coliform bacilli.

TABLE II.—Zones of Inhibition produced by Fluids withdrawn One Day after Local Treatment with Penicillin Solution (usually 1,000 Units per c.cm.)

	No. of Cases giving Zones (in mm.) of					
	0	1-3	4-6	7-10	11-15	16-21
Sinuses ..	10	2	3	5	4	1
Wounds ..	18	11	5	5	10	32
Totals ..	28	13	8	10	14	33

Mechanical factors favouring retention again appear paramount in determining results. It is possible that the vascularity, or other properties of the tissue bordering a cavity have also some influence, but clear evidence of this has not been obtained.

#### Estimations of Penicillin Content of Blood

During systemic treatment the penicillin content of the blood should be estimated. This is possible only by determining the bacteriostatic power of the serum either for the patient's own organism or for the standard staphylococcus. All methods for doing this depend on using the undiluted patient's serum and dilutions of it in normal serum as a culture medium; a small inoculum of staphylococci grows in serum in the form of colonies, which may be counted if such cultures are made on slides, the cover-slip being sealed with petroleum jelly. Inhibition of growth in any given dilution may be either complete (no colonies) or partial (fewer colonies than in a normal serum control).

Dosage in this series of cases was uniform, 120,000 units a day being given to adults and a correspondingly smaller dose, approximately related to body weight, in children. The penicillin content of 37 specimens of blood from 13 patients receiving penicillin by intravenous drip or other continuous method of administration is stated in Table III.

TABLE III.—Numbers of Serum Specimens Bacteriostatic to Oxford H Staphylococcus in Different Dilutions

Bacteriostasis:							
Nil in pure serum ..	..	..	..	..	..	..	1
Partial in pure serum ..	..	..	..	..	..	..	5
Complete in pure serum ..	..	..	..	..	..	..	11
Partial in 1 in 2 serum ..	..	..	..	..	..	..	3
Complete in 1 in 2 serum ..	..	..	..	..	..	..	7
" " 1 in 4 serum ..	..	..	..	..	..	..	5
" " 1 in 8 or over ..	..	..	..	..	..	..	5

These variations cannot be fully explained, although one cause of a high titre may certainly be retention due to renal inefficiency; 3 of the 5 specimens listed as "1 in 8 or over" came from the case referred to also by Morgan, Christie, and Roxburgh (p. 515), in which repeated estimations (not listed here), after administration was stopped, showed long delay in excretion. A concentration giving complete inhibition in pure serum is probably adequate for full therapeutic effect, and *in vitro* tests (to be published later) have shown that the rate of death of staphylococci in blood containing penicillin is not accelerated by increasing the penicillin concentration within the range of 0.1 unit to 10 units per c.cm.

When three-hourly intramuscular injections are given, the blood concentration is known to rise rapidly after each injection, then to fall progressively until the next. Specimens obtained immediately before a dose was due gave no inhibition at all in 6 and partial inhibition in pure serum only in 3. A much greater number of such estimations must form the

basis of any judgment on this method of treatment; but to gain an idea of whether dosage is adequate must clearly be more difficult; and on theoretical grounds the maintenance of a steady level by continuous administration seems to me more likely to achieve full therapeutic effect.

#### Comment

This condensed account of laboratory work on cases of which are described by foregoing authors is no more than an interim report on a study still in progress. It is intended to present a picture of the nature and volume of work which is called for from the laboratory if penicillin treatment is to be directed intelligently and, still more, if its efficiency is to be improved. At the same time a few minor original observations are briefly reported which may be of some service to other workers.

The greater part of the technical work here described was carried out by Miss P. M. Waterworth. Her services and the equipment of the laboratory used were made available by the generosity of "Bundles for Britain," which organization provided a fund under the control of Mr. Rainsford Mowlem for laboratory work in connexion with his surgical unit.

## Medical Memoranda

### Reliability of the X-ray Diagnosis of Early Pulmonary Tuberculosis

The case cited by Dr. Sharpe in the *Journal* of Nov. 6, 1943 (p. 579) and the series of letters which followed have brought into prominence the important question as to how far x-ray films of the thorax can be relied upon in the early diagnosis of pulmonary tuberculosis. The following is a case in which a fatal miliary tuberculosis supervened shortly after the lungs were declared to be entirely free of evidence of infection by a reliable radiologist who has had great experience in reading radiographs. This x-ray examination was made while the patient was in hospital suffering from tuberculous meningitis.

An electric welder aged 21 was admitted to hospital complaining of severe headache. Clinical signs of meningitis developed, and laboratory findings confirmed the diagnosis. The radiograph of the chest taken while in hospital was negative. Death occurred on the thirteenth day after admission. Necropsy findings were: a typical Ghon lesion about 1 cm. in diameter lying immediately beneath the pleura in the upper part of the right lower lobe, the lesion involving a vessel of medium size; enlarged caseous glands at the root of the right lung; small caseous tubercles in the cerebral meninges, spleen, kidneys, and adrenals.

The questions which arise are how frequently cases are missed by the radiologist, and what type of lesion it is which fails to show up in the x-ray film. As to the first matter, Dr. Richards, radiologist to the Toronto General Hospital, has collected the statistics of active tuberculosis developing in enlisted men in Canada during the first two years of the war. He finds (*Amer. J. Roentgen.*, 1942, 47, 66) that 16 men who had negative x-ray films on enlistment developed active tuberculosis—a percentage of only 0.004. We are informed verbally by a urologist in charge of one district in Canada, however, that he has seen no fewer than four cases of tuberculous epididymitis in soldiers who must have passed the test of a chest radiograph. This means that a percentage which is not negligible is declared free from evidence of pulmonary tuberculosis after inspection by the radiologist.

#### LESIONS WHICH FAIL TO SHOW UP

As to the matter of the type of lesion which fails to show up in the x-ray film, we are inclined to believe that many localized cases of primary tuberculous infection are invisible in radiographs. For the sake of brevity we may refer to this primary tuberculous pulmonary lesion as the Ghon lesion. It is situated at the periphery of the lung immediately under the pleura, usually not at the apex, and it consists of a small area of caseous consolidation later surrounded by a rampart of fibrous tissue. Spreading from it is a chain of infected lymphatics terminating in a caseous gland in the hilum of the lung. It is a moot point whether this lesion—which is usually small, often less than 1 cm. in diameter—can be demonstrated by x-rays, especially if it be placed laterally and so hidden behind the ribs. When it becomes the seat of calcareous deposit it is more easily seen.

As to the matter of appearances in x-ray films which are suggestive of tuberculosis but which are not tuberculous in origin, probably every radiologist has seen suspicious lesions which disappear after a short time. Virus pneumonia of an

interstitial type and the rare condition of sarcoidosis both give pictures which may be confused with those found in tubercle.

The time which elapses between the exposure of susceptible persons to an open case of tuberculosis and the first radiological evidence of tuberculous disease is frequently three years or more in adults. This is the period of the Ghon lesion. During this interval the earliest evidence that a tuberculous focus is present in the body is the change in the allergic response to tuberculin. Another point of importance illustrated by the above case is that throughout the first few years of infection there is a tendency to bacillæmia, with resultant metastatic foci in various organs such as meninges, bone, kidney, and epididymis. It is remarkable how often necropsies are performed on cases of military tuberculosis without the pathologist being able to assign to one particular lesion the role of primary focus of infection, the fact being that it is a minute primary focus of the type indicated.

We are inclined to agree with Dr. Fawcitt (*Journal*, 1943, 2, 692) that there is no such thing as x-ray diagnosis but there is x-ray evidence, and that this fact is not yet fully appreciated. Nevertheless, mass radiography of recruits, schools, and nursing personnel is wonderfully reliable in spite of the occasional false negative and false positive.

JAMES MILLER, M.D.,  
W. D. HAY, M.D.,  
Department of Pathology,  
Queen's University, Kingston, Canada.

### Tuberculin Jelly Patch Test

**Other Tuberculin Skin Tests.**—Since the introduction of the Vollmer patch test in 1937 much experience of its advantages and disadvantages has been gained. On the whole, it is a satisfactory and comparatively simple method of performing a tuberculin skin test. There is a tendency, however, for the patches to become dry and the tuberculin inactive, with consequent inaccuracies in the results. This has been especially noticeable during the war years. Compared to the Mantoux intracutaneous test, it can be said that the Vollmer patch test with freshly prepared patches is at least 95% accurate.

**Tuberculin Jelly.**—Recently an opportunity has arisen for the carrying out of a series of tests with tuberculin jelly, prepared as follows:

Old tuberculin (tuberculinum pristinum)	..	..	95%
Inert adhesive .. .. .	..	..	5%

**Method of Application.**—The jelly is put up in small tubes, and after an area of skin between the shoulder blades has been carefully cleaned with acetone (for preference) a small portion of the jelly is pressed out on to the cleaned area. (I have found it more satisfactory to use a specific marking, which in my case has been the letter "V.") Without waiting for the jelly to dry, a piece of elastoplast about 1 in. wide and 2 in. long is used to cover the jelly and is allowed to remain on the back for the usual 48 hours. Meantime instructions are given that the child should not be bathed for this period, and after the removal of the plaster the back is viewed daily for several days.

**Reading the Test.**—A positive test is shown by an erythema or slight vesiculation of the skin in the shape of the marking used. A negative result is shown by a completely normal appearance of the skin area on which the jelly was applied.

**Results.**—Experience has shown that with the letter "V," the arms of which are 1/2 in. long, the reaction is equivalent to that of 0.1 c.c.m. 1/100 old tuberculin (intracutaneous Mantoux test). In a recent series of 100 (specially selected) children, to whose backs the tuberculin jelly was applied, both at the Hospital for Sick Children, Great Ormond Street, and the Children's Department, Westminster Hospital, in-patients and out-patients, the following results were obtained:

Result	Vollmer Patch	Mantoux	Tuberculin Jelly
Positive ..	32	35	35
Negative ..	68	65	65
	100	100	100

**Conclusions.**—It would appear that in this series tuberculin jelly was a more accurate method of performing the skin test than the Vollmer patch test. No local reactions of undue severity were recorded. Other advantages appear to be: (1) the much smaller cost of the jelly in comparison with the patches, which is a considerable item in out-patient departments and clinic work; (2) the jelly will keep indefinitely in the tubes and is therefore more suitable for the general practitioner who may use this test only at infrequent intervals.

I have to thank Mr. Drebbin, of Messrs. Allen and Hanburys Ltd., for supplying me with the jelly and for his helpful suggestions.

London.

DONALD PATERSON, M.D., F.R.C.P.

## Reviews

### AN ORNITHOLOGIST ON EVOLUTION

*Systematics and the Origin of Species from the Viewpoint of a Zoologist.* By Ernst Mayr. (Pp. 334, 26s. 6d.). New York: Columbia University Press; London: Oxford University Press

Darwin had a profound knowledge of systematics, palaeontology, and genetics, on all of which the theory of evolution rests. His successors cannot hope to cover so wide a field, though Dr. Huxley has very nearly succeeded in his recent *Evolution*. Dr. Mayr is an ornithologist, whose work has been largely in the present Pacific war zone, and his facts, like those of Wallace, are mainly drawn from the study of living animals and their geographical distribution. The book is absolutely first rate, and every naturalist will find much in it to interest him.

After a very full discussion of geographical variation, the author concludes that some geographical races may develop into species, though he cannot agree with Darwin that "varieties are incipient species," since very few are likely to reach specific rank. The essential step in species formation is the prevention of crossing between two races. Dr. Mayr believes that, in animals at least, this almost always occurs in the first instance through geographical isolation. This may cause such differences of behaviour that the new species will not mate when they get the chance, and simultaneously or later, physiological differences which render the hybrids inviable or sterile. Here he will not convince all readers, though he makes a strong case.

Medical readers will be interested to see that he divides the malaria mosquito *Anopheles maculipennis* without hesitation into six species, which are reproductively isolated from one another, and does not regard them as mere "biological races," even though the adult forms cannot as yet always be distinguished. The student of *Homo sapiens* in his and her infinite diversity will find Mayr's discussion of other "polytypic species," all of whose geographical races can breed together, of great interest. It would have been a wholesome discipline if Hitler on the one hand and some of the more extreme exponents of human equality on the other had been compelled to study the geographical races of some of the birds of New Guinea in order to obtain a biological background for their theories.

While Dr. Mayr's book is not for general consumption, it should be within reach of every student and practitioner of medicine who wishes to keep up with the present position of evolutionary theory on the one hand and zoological classification on the other, as well as every ornithologist. To the student of genetics it presents a vast array of problems, of which the simplest is to determine, for every geographical race described, how far its characters are due to heredity, and how far to environment. I for one am going to re-read it several times.

J. B. S. HALDANE.

### VASCULAR LESIONS AND TUMOURS OF THE SPINAL CORD

*Vascular Abnormalities and Tumours of the Spinal Cord and its Membranes.* By Roger Wyburn-Mason, M.D., B.Chir., M.R.C.P. (Pp. 195, 18s.) London: Henry Kimpton, 1943.

The relative rarity of the pathological lesions with which this volume is concerned must be largely responsible for their comparative neglect. Dr. Wyburn-Mason has been fortunate in having access both to the collection at the National Hospital and to cases coming under the care of neurosurgeons at several other centres. He has given a full, careful, and interesting presentation of his gleanings, which comprise 67 well-illustrated cases. This series represents a substantial addition to the literature, which so far contains little more than twice that number of cases. It will be profitably studied by those who are interested in these lesions, whether from the clinical or from the pathological aspect. The classification follows much the same lines as those previously outlined by Bailey and Cushing, and by Bergstrand. From the last-named, however, he differs in requiring a separate class for arterial anomalies and in including the cavernous angiomas with the telangiectases.



which are held—very credibly—to be precursors of the cavernous lesions. Bergstrand, it may be recalled, doubts the existence of racemose angiomas of purely arterial character. Wyburn-Mason, under the heading of arterial anomalies, describes aneurysms of the spinal arteries in association with coarctation of the aorta, and, further, anomalies associated with, or independent of, cardiac lesions. The latter are, however, unconvincing in the absence of histological verification.

The classification is marred by the inclusion of two dubious conditions—syphilitic aneurysm of the spinal arteries, and lymphangioma. Since these find no place in the author's extensive experience, and, moreover, are based on unsound pathological premisses, they would occupy a better perspective as footnotes than as chapter headings. It is surprising to read, on page 47, that attention is here being drawn to a clinical condition not previously mentioned in the literature—namely, spontaneous subarachnoid haemorrhage. This can hardly be what the author intended to convey, in view of his references to the literature in later paragraphs. His account of the symptomatology of this condition agrees well with that of Gowers.

The style and price of this volume are an agreeable surprise in a wartime production.

### LABORATORY TECHNIQUE IN TYPHUS

*Técnicas de Laboratorio en el Titus Exantemático.* By Prof. G. Clavero del Campo (Director del Instituto Nacional de Sanidad) and Dr. F. Pérez Gallardo (Médico de Sanidad Nacional). (Pp. 185; with 104 figures, 7 coloured.) Madrid: Imprenta de Prensa Española, 1943.

This interesting monograph was published as a sequel to the typhus epidemic which occurred in Spain during 1941-2. In an earlier volume by the same authors, which was also issued by the Spanish Health Directorate, an equally comprehensive review of the aetiology, clinical aspects, and prophylaxis of louse-borne typhus had been given. About half the present volume is occupied by the description of methods of isolating *Rickettsia prowazeki* by guinea-pig inoculation, by anal inoculation of lice, and by culture in the yolk-sac of the developing chick, and a further section deals with the isolation of the rickettsiae of murine typhus. There is a section on the Weil-Felix reaction, on agglutination with suspensions of rickettsiae, and on Giroud's intradermal test. In the remaining chapters the authors describe the preparation of the different types of killed typhus vaccine—namely, those made from rickettsiae grown in the louse-gut (Weigl), yolk-sac (Cox), rat-lung (Castaneda), and rabbit-lung (Durand and Giroud). Every detail of the various procedures described is fully illustrated by photographs and drawings, and readers with little knowledge of Spanish will find it comparatively easy to follow the text, thanks to the numerous and excellent illustrations.

In a foreword written by Prof. J. A. Palanca, Director-General of Public Health, an interesting account is given of the activities of the health department during the recent epidemic. This book should certainly be very helpful to laboratory workers who have had no previous experience of typhus but are likely to make contact with the disease during or after the present war.

### THE ARMY MEDICAL SERVICES

*R.A.M.C.* By Anthony Cotterell. (Pp. 116; illustrated. 6s.) London: Hutchinson and Co.

In *R.A.M.C.* Anthony Cotterell gives a vivid picture of the many-sided activities of the Army Medical Services. In his own words, "the main purpose was to describe a difficult job well done by all ranks in the R.A.M.C., from the generals who advise and plan down to the orderlies washing out the medicine bottles." His description might itself be described as a difficult job well done, for it is a most readable book. A large part is made up of actual experiences in the field, and the author has chosen his material well and is an excellent story-teller. It is natural perhaps that the treatment and evacuation of battle casualties should have the lion's share at the expense of other interesting features, but Mr. Cotterell has managed to cover a very wide field. The problems of malaria control, water supplies, camp hygiene, preventive inoculation, blood transfusion, methods of dealing with psychiatric casualties, the "lead-slinger," and many other special aspects are faithfully dealt with and fitted into their

place in the general plan. One would have liked to see section on the Q.A.I.M.N.S., but it is good to note the author's promise that the sisters are to have a volume of their own.

The doctor or medical officer reading this book may at times be irritated by paragraphs reminiscent of the style of *First Aid to the Injured* or *R.A.M.C. Training*, or, in the section on oral hygiene, of a Health Week leaflet, but it will be borne in mind that these explanations are interesting and helpful to others. The gratitude of N.C.O.s and men of the R.A.M.C. is due to Mr. Cotterell for showing that they have in full measure the hazards and hardships of war with their comrades in the more spectacular branches of the Services, and that they are no less entitled to be called soldiers though nominally protected by the Geneva Convention. If it helps to remove the impression, unhappily prevalent in some quarters and keenly felt by many a humble private, that every nursing orderly is "either a conchie or a crock," this book will do a great deal of good.

### Notes on Books

A Sixth Supplement to the *British Pharmaceutical Codex*, 1934, is published at 2s. 6d. by the Pharmaceutical Press, 17, Bloomsbury Square, W.C.1, by direction of the Council of the Pharmaceutical Society of Great Britain. It contains additions and amendments to the monographs in Part I and Part II, with amendments to formulae in Part III.

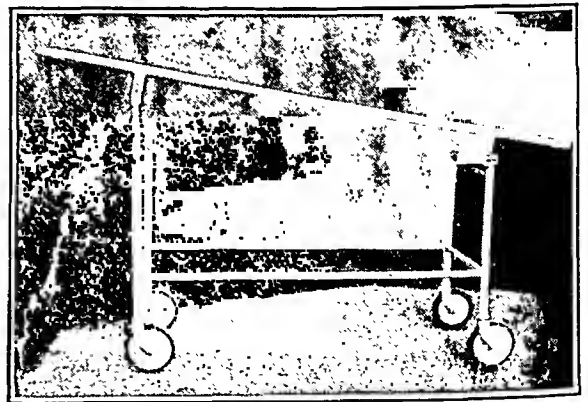
The County Accountants' Society (County Hall, Chichester) has published a booklet on *Classification of Patients under the Emergency Hospital Scheme*, prepared by the county accountant of Middlesex. It is believed that Mr. Rothwell's summary, which contains in handy form a complete classification of patients under the scheme, and gives useful information under each classification, will be of value to administrative and financial officers concerned with the scheme. The booklet has been nominally priced at 2s. 6d.

### Preparations and Appliances

#### MODIFIED TROLLEY TO MAINTAIN TILTING DURING TRANSPORT AFTER SPINAL ANAESTHESIA

Mr. T. B. MOUAT, F.R.C.S., surgeon, E.M.S., writes from Wharfedale Emergency Hospital, Sheffield:

After operation with light spinal anaesthesia, or in a shocked patient, transportation back to the ward in a safe head-down position is facilitated by a simple modification of the ordinary type of theatre trolley.



The two tubular supporting pillars at one end have been cut across at their upper ends and two slightly smaller tubes, which are hinged at their attachments to the under-surface of the table, are telescoped into the original table supports, where they are fixed, to maintain the desired tilt, by pins in holes bored through both tubes. The attachments of the pair of supporting pillars under the opposite end of the trolley must, of course, also be hinged to allow the top of the trolley to be tilted in this way.

Our thanks are due to Mr. Sidney Wright of the hospital workshop for his co-operation in carrying out the alteration.

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SATURDAY APRIL 15 1944

## TREATMENT WITH PENICILLIN

The therapeutic properties of penicillin were first disclosed in animal experiments by Florey and his co-workers<sup>1</sup> in 1940, and their first account<sup>2</sup> of succeeding essays in the clinical field appeared in the following year. These were the days when penicillin was being made only in the laboratory, and supplies sufficed for the treatment of only 5 cases of severe staphylococcal infection and a few of conjunctivitis and other local infections. The next report from Oxford,<sup>3</sup> nearly two years later—an interval during which both production and the quality of the product had been improved—added a further series of cases of staphylococcal septicaemia, osteomyelitis, and cavernous sinus thrombosis, all successfully treated, many cases of chronic sepsis treated locally, and further information about eye infections and the treatment of mastoiditis. These studies laid the foundations of penicillin treatment, and clearly indicated two things: that given systemically the drug will control septicaemia or other extensive and dangerous infections due to *Staph. aureus*, and that applied locally it is the perfect antiseptic when circumstances permit its continuous action. It should not be supposed that staphylococcal infections stand alone in being thus amenable to systemic treatment; they were chosen because the sulphonamides have so little real power over them. Haemolytic streptococci and pneumococci are even more susceptible to penicillin, but the infections which they cause are usually so relatively controllable by sulphonamide treatment that the use of penicillin for them was unjustified. From this point the story is taken up elsewhere than in Oxford, and several further specific uses for penicillin have been described in later papers. These include the treatment of burns, which has been studied by Bodenham<sup>4</sup> and by Clark *et al.*<sup>5</sup>; of septic infections of the hand, where according to Mrs. Florey and Williams<sup>6</sup> a small amount of penicillin will go a long way in preserving function and restoring it rapidly; and the treatment of battle wounds, recently reported on by Florey and Cairns.<sup>7</sup> These are the efforts of our own workers. Clinical study on an even larger scale has been in progress in the U.S.A., and we referred not long ago<sup>8</sup> to a preliminary report on the treatment of no fewer than 500 cases, many of which received systemic treatment; but details of many of the groups of cases included in this total have not yet been published. Much larger supplies of penicillin are available in America, and it is there that the treatment of both gonorrhoea and syphilis has been developed, as we noted in a recent issue.

A year ago, when supplies from commercial sources in England had reached sufficient proportions, some was placed at the disposal of the Medical Research Council, and through its Penicillin Clinical Trials Committee several centres were established for further therapeutic study. A report from one of these centres, taking the form of eight separate papers on different aspects of the subject, occupies the whole of the space devoted to original papers in this issue of the *Journal*. In their introduction Christie and Garrod define the policy of such a centre, and refer to the transition from all-embracing enthusiasm to caution in selecting cases with particular needs clearly in view, which is inevitable when supplies are limited. There is still not nearly enough penicillin available for treating all the cases even of a few conditions, such as staphylococcal septicaemia, in which the value of heavy systemic dosage is fully established. Since the purpose of the work was to break new ground rather than to exploit existing knowledge, such cases had often to be refused. It is nevertheless as well to warn those who will have greater opportunities in the future that even penicillin is no guarantee of cure in staphylococcal septicaemia. Apart from several cases of osteomyelitis in this series with a positive blood culture, all of which did well, there were 4 cases of septicaemia in which 2 patients died in spite of heavy and long-sustained dosage. The opportunity afforded by these and other cases undergoing systemic treatment was taken to study new methods of administration. Florey advocated originally a continuous intravenous drip and later single intramuscular injections at 3-hourly intervals. The disadvantages of the former are difficulty of accurate regulation, liability to thrombosis, and sometimes shortage of veins; of the latter, the ordeal for the patient who must submit to painful injections continued with inexorable regularity by night as well as by day for perhaps more than a week. The merits of both routes seem to be combined in the intramuscular drip described by Morgan, Christie, and Roxburgh, and these authors have also explored the possibilities of infusion via the bone marrow.

A policy at this centre has been to study further the treatment of infections of bone, and two papers deal with this from different aspects. In Robertson's hands the treatment of acute osteomyelitis by the systemic route had the almost uniformly favourable results which have already been reported. Early treatment appears to be essential, the least satisfactory case being one in which it was resorted to a full month after the onset. The account of attempts to treat chronic bone infections, whether haematogenous or due to compound fractures, and whether by local application in various forms or even by the systemic route, makes very different reading. It is indeed a record largely of failure, and surgeons and others who are clamouring for penicillin in order to treat cases of this kind may console themselves with this evidence that their deprivation may not be the misfortune they think. Robertson himself gives good reasons for these disappointing results, and contemplates changes in surgical technique which may improve them. Penicillin is not a magic elixir the mere instillation of which into a sinus or bone cavity will lead to healing. It can deal only with bacteria

<sup>1</sup> *Lancet*, 1940, 2, 226.<sup>2</sup> *Ibid.*, 1941, 2, 177.<sup>3</sup> *Ibid.*, 1943, 1, 357.<sup>4</sup> *Ibid.*, 1943, 2, 725.<sup>5</sup> *Ibid.*, 1943, 1, 605.<sup>6</sup> *Ibid.*, 1944, 1, 73.<sup>7</sup> *British Medical Journal*, 1943, 2, 755.<sup>8</sup> *Ibid.*, 1943, 2, 582.

which it can reach, and it cannot remove dead or irreparably damaged tissue. These findings may usefully be compared with Mowlem's experience in the treatment of osteomyelitis of the mandible. His practice here is to remove all the affected bone, leaving perhaps only a thin lingual plate to maintain continuity. It was formerly necessary to leave the wound open and allow it to granulate. He now closes it completely, having inserted two tubes through which the bone cavity can be filled with penicillin solution from above; infection is thus suppressed and rapid healing is secured. This is a new application of the principle first enunciated by the Floreys, with the new mastoid technique as their example, that septic wounds which are to be treated with penicillin must be sewn up in order to retain the solution. The success of the operation is clearly the effect of radical removal of affected bone, and perhaps nothing short of this will provide the answer to chronic osteomyelitis in other parts of the skeleton. The mandible has two advantages from this point of view: it is easily accessible and non-weight-bearing. Corresponding treatment of some of the long bones may well be surgically impossible.

Several papers deal wholly or in part with various infections of soft tissues. Fraser has begun a study of the treatment with penicillin of staphylococcal breast abscess, and it seems that aspiration of pus and injection of penicillin solution will sometimes replace operation, and usually hasten recovery. It has yet to be decided whether, as is hinted elsewhere in connexion with empyema, it may prove better policy to evacuate the contents of the abscess surgically and rely on penicillin to achieve and maintain subsequent sterility. Barron and Mansfield bring out several useful points in connexion with the use of penicillin in plastic surgery: it has evidently several uses here, as would be expected from the damaging part which pyogenic infection can play, and the usual full accessibility of the infection to treatment. Roxburgh, Christie, and Roxburgh describe the treatment of 75 cases of various diseases of the skin. This is almost a new field and evidently a promising one, at least in so far as the condition treated is due to infection by staphylococci or streptococci. That impetigo should be curable is no new thing, but penicillin seems to achieve this effect more quickly than anything else. That sycosis should be quickly controlled in a majority of cases is decidedly something new, and this achievement, should longer experience confirm it, will rank high among the minor benefits of the discovery of penicillin.

A final paper by Garrod gives an account of the extensive laboratory work entailed by fully controlled penicillin treatment. The necessity for this may well give pause to those who look forward to the wider availability of penicillin, since laboratory service on this scale is not everywhere available; but perhaps greater experience and more standardized methods of treatment may dispense with the need for at least some of this work. New observations reported are the variable sensitivity to penicillin of *Actinomyces*, with corresponding variations in the effects of treating several cases, and the susceptibility to penicillin of mouth bacteria generally, again reflected in the good

results in osteomyelitis of the jaw, a condition of which the flora, aerobic and anaerobic, may be complex. Actual instructions for the performance of laboratory investigations in connexion with penicillin treatment are not given for these the reader is referred to M.R.C. War Memorandum No. 12, the publication of which we noted last week.

We look forward to hearing further accounts of the work on this subject now in progress. The general principles are now understood, but specific new applications continue to be discovered. This is not merely a matter of thinking of something new to treat: it may involve devising a new method of application or a change of surgical technique to suit the altered circumstances created by penicillin. There is thus still room for enterprise, notably in special departments of surgery which so far have had little chance to try their hand with the new weapon.

### CUTANEOUS DIPHTHERIA

Diphtheria in cutaneous and other forms gave a lot of trouble to the Army in the Middle East during the war of 1914-18, and it is once more giving concern to medical officers on service. Major Bensted<sup>1</sup> described what was probably the first epidemic of faucial and cutaneous diphtheria among troops on a military frontier: the epidemic was brought under control by Schick-testing and active immunization. Cameron,<sup>2</sup> Muir,<sup>3</sup> and Marshall<sup>4</sup> describe outbreaks in Northern Palestine and in the Middle East in 1940 and 1941. Cameron tells of the Jewish children in Palestine near the camps with a considerable incidence of nasal, crusted, discharging sores, and refers to a local description by Bernfeld.<sup>5</sup> Lack of full laboratory facilities prevented the complete examination of strains of diphtheria-like bacilli found in the children or in military patients, but of the 40 cultures obtained from clinically accepted cases of diphtheria, 31 strains proved virulent on test. Some were reported avirulent, but the author points out that the suspension for animal tests was made in saline—a fluid noxious to diphtheria bacilli.<sup>6</sup> Cameron discusses whether contact with horses might account for infection, but he failed to find bacilli in the throat, nose, or skin of horses or in the fodder. Parish and Okell<sup>7</sup> found virulent *C. diphtheriae* in three of 13 swabs taken by Dalling from wounds in horses occurring in a military camp in Scotland. Cameron and Muir<sup>3</sup> treated their epidemic of cutaneous diphtheria by isolation, Schick-testing, and active immunization. Their observations agree in all important points with those of Bensted and the American Official History of the War.<sup>8</sup> Cutaneous diphtheria may complicate any form of wound, burn, blister, impetigo, eczema, Oriental sore, whenever faucial diphtheria prevails and the patient may infect his own skin. As skin lesions have been followed by severe paralysis, it is wise to give such patients

<sup>1</sup> *J. R.A.M.C.*, 1936, 67, 295.

<sup>2</sup> *Edinb. med. J.*, 1943, 50, 1.

<sup>3</sup> *Lancet*, 1942, 2, 720.

<sup>4</sup> *Med. J. Austral.*, 1942, 2, 14.

<sup>5</sup> *B. J.*, 1942, 2, 154.

<sup>6</sup> *B. J.*, 1942, 2, 73.

<sup>8</sup> *U.S. History of the World War*, 1928, 9, 259, Washington.

an immediate and substantial dose of antitoxin—e.g., 15,000 units. Swabbing of contacts, Schick-testing, and active immunization have, even under war conditions, given a rapid and satisfactory control of epidemics.

When the local lesion comes under medical care the crusts may be removed by saline packs or baths or with glycerin magnesium sulphate or hydrogen peroxide, revealing an ulcer with greyish, membranous slough. Dressings cut to fit accurately in the wound are valuable; hairs around the edge are removed and the skin protected from further infection. The rapidly forming granulations are carefully protected; scarlet red ointment and the aniline dyes have been much used. (Harries<sup>9</sup> gives a valuable review of cutaneous diphtheria.) Carrier rates of from 4 to 3% were observed by Cameron. The few persistent carriers were cured by tonsillectomy. H. Williams<sup>10</sup> recently described an unusual series of cases. Over a period of eight months 19 patients in a military hospital yielded positive cultures a few days or weeks after admission and were found to be suffering from diphtheria of the skin or eye. Six had conjunctival infections, and one patient suffered grave damage to both eyes. The 19 patients were transferred to the isolation hospital; all received antitoxin, and fortunately no paralysis developed. During the same period 17 cases of faucial diphtheria and one of diphtheritic rhinitis, including seven of the staff, came from the same military hospital. Williams suggests the need for more frequent bacteriological investigations of skin infections. Cameron and Marshall both stress the need for active immunization of troops in the Middle East. This plea comes also from Wheeler and Morton,<sup>11</sup> who describe a severe epidemic at Halifax in Canada. The diphtheria occurred there at much later ages than usual; in females the greatest incidence was in the 20-25 age group. The Halifax epidemic was presumably maintained "by the exchange of infection, between the soldiers, sailors, and visitors and their wives or sweethearts in the town."

It is not easy to see clearly the relationship between McLeod's types of diphtheria bacilli and the distribution of the disease. The Halifax outbreak was thought to be the first on the West side of the Atlantic due almost entirely to the gravis type. Murray<sup>12</sup> records a curious position on Witwatersrand in South Africa. Intermedius strains were never recovered from local cases of diphtheria; about 85% of local infections were due to mitis, and the case mortality was high—about 9%. Murray believes that with a high Schick-positive rate in the community and a low carrier rate among children the stage is set for an explosive outbreak at any time from the importation of a more virulent strain; he concludes that active immunization is urgently necessary. Since in certain districts the predominant type may alter from year to year and even from season to season, we obviously have still much to learn. The artificial immunization of some three millions or more of children in England during the past few years may result in disturbance of type distribution or even in the prevalence of types difficult to classify.

## CARE OF THE PREMATURE INFANT

One important way in which neonatal mortality can be reduced is undoubtedly by better facilities for the care of the premature infant. It is estimated that about half the deaths in the first month of life occur in the prematurely born, and experience has shown that organized effort can do much to improve the chances of the immature infant. The often-quoted Chicago figures bear this out, for coincident with a reduction in the neonatal death rate in that city from 37 per thousand live births in 1925 to 18 in 1940 there was developed a city-wide plan for dealing with the premature infant. In this country a start can be fixed in the year 1937, when a joint committee of the Royal College of Physicians of London and the Royal College of Obstetricians and Gynaecologists put forward a recommendation that the "5½ lb. or less" standard should be accepted as a working definition of a premature or immature baby "for the purposes of comparison of records." The next landmark is in the issue of a circular by the Ministry of Health to all welfare authorities, dated March 22, 1944, on the care of premature infants. This is based upon the recommendations of the Minister's Advisory Committee on the Welfare of Mothers and Young Children, and while it is quite clear that many of the suggestions cannot be put into effect at the present time because they involve staff and accommodation they give local authorities a clear lead in their planning for the future. First comes the "provision of accurate information"—namely, a means of securing notification by the simple device of having the weight of all newborn infants noted on the notification of births card when this is 5½ lb. or less. For the baby to be looked after in its own home importance is attached to certain details of accommodation, equipment, and expert services. A list of special equipment, to be lent by the authority when necessary, includes draught-proof cots, suitable clothing, hot-water bottles, electric blanket pads, special feeding-bottles, thermometer, and mucus catheters. A supply of expressed breast milk is also recommended when this is necessary. Specially trained midwives or health visitors are mentioned, and the services of a paediatrician are to be available. Home helps also come into the scheme. For immature babies born in hospital or admitted because of the need for institutional care the circular enters into important details as regards accommodation. Warm rooms with "cooling-off" facilities and regulated humidity receive recognition, and details of nursing staff are set out with the object of securing skilled care and continuity among the senior staff. A paediatrician is to be attached to all maternity units and his services made available for all special units for premature babies, a reform for which both obstetricians and paediatricians have been pressing. A special form of transport is mentioned, and the circular concludes with an important reference to the follow-up of infants "immediately" on discharge from hospital to their own homes. Action on the lines of the circular is long overdue, and it is to be hoped that authorities will lose no time in putting into effect as much as is practicable now.

## WARRINGTON YORKE MEMORIAL FUND

The late Prof. Warrington Yorke was a product of the Liverpool School of Tropical Medicine, and one of its most distinguished members. In addition to his jealous maintenance of the high standards set by earlier workers at the school he earned for himself an international reputation in the world of medical science, and his outstanding original work on trypanosomiasis, blackwater fever, the nematode parasites, and many other parasitic and tropical diseases has permanently enriched our knowledge of these

<sup>9</sup> Hurst, *Medical Diseases of the War*, 1943, chap. 25, London.

<sup>10</sup> *British Medical Journal*, 1943, 2, 416.

<sup>11</sup> *Amer. J. Publ. Hlth.*, 1942, 32, 947.

<sup>12</sup> *S. Afr. med. J.*, 1942, 16, 247.

subjects. In the latter part of his career, so untimely cut short, Yorke turned his exceptional energy and ability more and more to the elucidation of the mode of action and the therapeutic value of chemical compounds, especially in parasitic diseases. As a direct outcome of his pioneer work new potent weapons were forged against a number of diseases, in particular leishmaniasis and trypanosomiasis. These discoveries were of far more than academic interest; indeed, it may be said that Yorke's introduction of drugs of the diamidine series is making it possible to master kala-azar in those parts of the world where the disease is peculiarly resistant to the antimonial compounds. Just before he died he had initiated further studies in chemotherapy, and it was his aim to promote chemotherapeutic research in Great Britain to the front rank and firmly to establish Liverpool as one of its leading centres. To that end he laid a solid foundation on which to build.

The Council of the Liverpool School of Tropical Medicine feels that a fitting memorial to this remarkable man would be to place on a firm financial basis the recently created Chemotherapeutic Research Department, where the work he inaugurated will be continued in association with his name. To this end a Warrington Yorke Memorial Fund has been opened, and the Council believes that Yorke's many colleagues, friends, past students, and others who have benefited by the great advances which he helped to make in tropical medicine and hygiene during his forty years of service, will wish to be associated with this memorial. The Council of the School would welcome subscriptions, however small, which should be addressed to: The Honorary Treasurer, Liverpool School of Tropical Medicine, Chamber of Commerce, 1, Old Hall Street, Liverpool.

### SURGICAL SERVICE FOR INDUSTRY

The Birmingham Accident Hospital has completed its third year. It was a pioneer effort, at least on such a scale, and it has attracted observers from various parts of the country whose institutions have wished to profit from the Birmingham experience. Last year the number of new in-patients was over 2,000, and the number of day-ward cases 2,500. These latter are patients admitted to a ward for less than twenty-four hours, but requiring an anaesthetic, an operation, and a recovery period in bed. We can well believe that the short-stay ward is the busiest and the most expensive in such a hospital. In addition there were some 18,700 new out-patients, and nearly 3,000 new patients treated in the rehabilitation department. Altogether the total daily attendances number something like 400—an indication of the frequency of accidents, mostly minor no doubt, in modern high-pressure industry. The work of the out-patient departments is divided into three groups: fractures and the more serious types of injury; injuries without bone damage but including infections; and, finally, rehabilitation. For each of these groups there is an appointments system, so that waiting-time, especially to be avoided in an industrial hospital in war, has been greatly cut down. The complaint, however, is of shortage of medical staff. The medical staff numbers only ten, with three consultants. It is hoped that when the new out-patient department now being constructed is ready and equipped with new facilities it will be appreciated that the allotment of more medical staff to an institution of this kind would mean, among other things, economy of medical man-power.

One-sixth of the total floor space at Bath Row is devoted to special departments concerned with rehabilitation, meaning physiotherapy, physical training, and occupational therapy; and in all these the surgeons who have been

engaged from the first in the treatment of the particular case are present to supervise these later phases of recovery. Not everyone appreciates how individual a thing is restoration to fitness. This work does not lend itself to the construction of precise schedules. One man's corrective is another man's setback. The work calls for great adaptability on the part of the surgeon, of those who carry out his instructions, and of the patient himself. In industrial accidents rehabilitation and treatment are intertwined. They begin together on the day of the injury, and treatment ends with rehabilitation when the man is restored so far as possible to industrial and social capacity. Moreover, rehabilitation includes more than getting an injured limb back to full function. There may have been a more serious disturbance in the patient's social background, and, however effective the games instructor and the occupational therapist may be, they cannot achieve full restoration so long as the man is fretting over his domestic and economic problems. Therefore the social service department is as important as any in a rehabilitation centre.

Another participant in the work is the industrialist. An experiment has been undertaken by the Birmingham Accident Hospital in conjunction with the Austin Motor Company in which the firm has fitted up a workshop at its factory, under the supervision of the works medical officer, for the employment of disabled workmen. When the treatment of the men in hospital has reached a certain stage of recovery the rehabilitation methods can be stepped up to production level, using the same machines as in the factory, perhaps with some adaptations, and the man begins to feel that instead of playing at industry he is again a unit in the industrial organization. Up to the end of last year about 150 disabled persons returned to normal employment after passing through this special workshop. The scheme of a rehabilitation workshop attached directly to industry and at the same time closely co-operating with the hospital has been a success, and it is hoped that with the co-operation of other Birmingham industrialists it may be extended. The subscriptions to the hospital from industry during the year amounted to just upon £18,000; the City of Birmingham gave £10,000; and contributions on account of services amounted to £11,500 from the Hospitals Contributory Association and some £12,800 from the Ministry of Health; but there is an excess of ordinary expenditure over ordinary income of £4,000.

An industrial hospital offers fresh fields for research. The Medical Research Council has acknowledged this by establishing two research units in Birmingham. One of these is concerned with burns and is under the care of Col. Leonard Colebrook (whose letter in the *Journal* of March 4, page 342, on the first-aid treatment of thermal burns and scalds will be fresh in the minds of readers). The other unit, under Prof. A. A. Miles, is concerned with the bacteriological side of wound infection in industry. This unit has studied during the year over 5,000 swabs from more than 1,000 wounds, and on the basis of the survey, and with the co-operation of the hospital clinical and nursing staff, a new technique of wound dressings has been instituted. An eight-months research on the use of penicillin in the healing of wounds and various septic conditions has been completed during the year by Dr. Ethel Florey, and it is mentioned that about 1,000 man-days were saved by the treatment of 35 industrial cases with this preparation. But penicillin is not yet available in sufficient supply to be used in the hospital. The arrangement of these researches is another example of the enterprise shown in this field, and there is every advantage to be gained from a study of such problems on the spot—that is to say, in a hospital which keeps an open door for the daily victims of the industrial machine.



## Correspondence

### Reform in Medical Education

SIR.—Dr. Douglas Guthrie (March 25, p. 432) is right that the principle which is fated to co-ordinate our ever-multiplying medical specialisms need not be sought in modern psychology. Speaking generally, this latest "subject" (which emanated originally from the decadent great-city life of Greater Germany) is itself but another specialism, isolating a "psyche" from the rest of life. How then, asks Dr. Guthrie, are we ever to supply medical students with the first principles of the healing art? He thinks, by teaching them the history of medicine. I should greatly doubt, however, whether this will prove a solution, and, apropos, may I touch on some personal experience? Before the last war, being in general practice in Edinburgh, I devoted a lot of my spare time to a survey of the whole field of medical history, and even gave lectures on the subject. Incidentally I translated for the Loeb Classical Library one of Galen's most characteristic shorter treatises, and became very familiar not only with the vocabulary but with the outlook of this greatest synthetic medical mind of antiquity. I cannot speak too highly of the stimulating effect which this study and discipline, being grafted on my own daily experience of practice, had on my own mind, and how it deepened my appreciation of and love for the *ars medendi*. But I firmly believe that the average medical student of to-day would, by reason of his preliminary training, be incapable of profiting by lectures on this topic. To the large majority of these young men it would just prove another "extra subject" to be memorized along with all the other "facts" of an already grossly overloaded curriculum, thus fragmenting their minds more than ever. Only experience of general practice, and preferably of country practice, where the doctor is still known much more on his own responsibility than in the cities, can breed a mind capable of absorbing and profiting by the cultural side of medical humanism.

If the powers that be, including the framers of the present White Paper, were really, in the main, concerned with the health of our people and not, in the main, as they are, with making the world safe for bureaucracy, I would even now ask a favour of them. I would ask them to confine their legislative zeal to two enactments—one privative and the other constructive. From the National Health Insurance system I would ask them to cut out, by force if necessary, at least another 50% of this certificate-signing business which is now driving so many members of our profession desperate, if not melancholy mad. And the positive measure would be to make every young graduate begin his professional career by serving as an apprentice for two or three years to an established country doctor. This would be by far the most practical way of ensuring that "return to Hippocrates," with its synthetic and practical aim, which Dr. Douglas Guthrie and others so properly desiderate. It would rear a race of doctors of whom many, I believe, would eventually become capable of profiting by a study of the history of medicine. Such, however, should not be lectured to overmuch. They would need only to have their attention directed to the valuable material available, when, I am convinced, they would grasp it with open arms. Also they would grasp it each in his own way—which, after all, is the best kind of individualism.—I am, etc.,

North Queensferry, Fife.

A. J. BROCK.

### Shock Treatment of Mental Disorder

SIR.—Dr. Kalinowsky's very wise letter on this subject (April 1, p. 453), and the previous correspondence, once again raise the primary issue—are there in fact any diseases of mind *qua* mind? Is mind, whatever and wherever it is, capable of disease? Or are the abnormalities of speech and behaviour, at present so often regarded as being evidences of purely mental disease, in fact due to structural or biochemical defects in the nervous system, including the brain? In other words, are they really dependent upon the condition of the cells, tissues, or secretions by which mind—under any hypothesis

as to its nature and locality—can only, in this everyday turns feed and express itself?

The true In the absence, for instance, of post-mortem obsec visual and a knowledge of the action of the responsible spirid.14 io. the speech and behaviour of a man suffering from cHence, syphilis might well seem—and did probably once seen the be a purely mental disease, approachable only by psycholover, methods. But research has come to show that the anti-s of behaviour, the grandiose ideas, the decaying standardat a personal cleanliness, are in fact due to structural change a to some extent curable or at least preventable by appropri. It treatment of the invaded or threatened tissues. Other examplth can be readily thought of.

It May it not therefore be possible that the less gross aberrations of speech and behaviour associated with such conditions as schizophrenia, melancholia, hysteria, and the great group of anxiety and other neuroses are similarly due to structural or biochemical defects in nerve and brain tissue, relatively small perhaps and at any rate not yet discovered? We do not know the exact means whereby shock therapy can apparently transform and bring back to normal—at least for a time—aberrations of speech and behaviour. But it is difficult to believe that its action can be other than organic—an effect upon tissue and material processes.

To accept this view is not to decry the value of psychiatry, although it may challenge the foundations upon which some people base it. Thus A may have been bullied in youth, had dominating parents, and been shut up in a dark cupboard as a punishment. But he does not develop either an inferiority complex or claustrophobia. B, who has had the same experiences, does. The difference between them may still be explained by some relative defect in B of nerve or brain tissue or biochemical adjustment. But, pending the discovery of this, the psychiatrist can do a very great deal in providing B with a sane outlook on his handicap and a crutch to mitigate it. Just, however, as the anxiety and irritability so often associated with hyperthyroidism disappear after a successful thyroidectomy, so in future—if the possibility is acknowledged and sought for—may the anxiety neuroses and many other hitherto supposedly purely mental affections become removable by an appropriate treatment of material cells, tissues, or secretions.—I am, etc.,

London, E.C.1.

H. H. BASHFORD.

\*. But the problem remains—how does the psychiatrist provide "material cells, tissues, or secretions" with "a sane outlook"?—Ed., B.M.J.

SIR.—In his recent letter from New York (April 1, p. 469) Dr. Kalinowsky, while agreeing that convulsion therapy promotes accessibility to later psychotherapy, still maintains that the latter is of secondary importance. From the purely utilitarian standpoint he is correct, though he himself expresses disappointment at the empiricism with which the treatment remains enshrouded. I write now to offer certain suggestions and to draw attention to certain facts which seem to throw light upon the *modus operandi* of electrical convulsion treatment (E.C.T.).

There are two facts which will be generally admitted by all exponents of the method: first, that some degree of amnesia is to be expected, at least for a time; secondly, that there is a tendency for the patient to relapse, a tendency seemingly inherent though not invariable. In the writer's opinion these two different tendencies are in a measure inversely related. Dr. Kalinowsky correctly stresses the more striking success of E.C.T. in the psychotics rather than the psychoneurotics, pointing out that it is precisely where psychotherapy is most applicable that E.C.T. relatively fails. Now, it is the degree of insight, or, in other words, of conscious inner perception, of the trouble which distinguishes the psychoneurotic from the psychotic patient. In short, the greater the degree of higher conscious perception the less is the response to E.C.T. Here we have an array of facts—which incidentally could be added to—which seemingly all point in one direction—namely, towards the view that the production of amnesia is closely related to the improvement which ensues. The degree of amnesia produced doubtless varies according to the degree of consciousness which pre-existed in the psychical system

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ssible. This artificially produced accentuation  
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the widening of consciousness.

Further investigation these findings and views are  
they will clearly preclude the hope that E.C.T. is  
d ever likely to further scientific understanding of  
d and its processes. Nevertheless, I still hold the view  
n E.C.T. we possess the most generally applicable, and  
efore upon the whole the most valuable, method of treat-  
nt in vogue in psychiatry to-day.—I am, etc.,

Warlingham.

WM. H. SHEPLEY.

### Vaccination against Smallpox

SIR.—In the annotation on vaccination against smallpox (*Journal*, March 18, p. 399) it is stated that "ordinarily a single linear scratch one-quarter inch long is sufficient." In the recent epidemic in Edinburgh the officially issued instructions were: "The actual vaccination should consist of three parallel strokes  $\frac{3}{4}$  in. long and  $\frac{1}{4}$  in. apart." This reveals a very pronounced difference of opinion among authorities. I find that in Price's *Practice of Medicine* (4th ed., 1934) it is stated that "the degree of protection afforded against smallpox is in some degree proportional to the extent of the vaccinal lesion, and the resulting scars should, together, cover an area of not less than half a square inch. Hence the advice always to make at least two insertions and preferably four." In the 1942 epidemic in Glasgow the scarification officially prescribed was "three strokes  $\frac{3}{8}$  in. long and  $\frac{1}{8}$  in. apart."

In the above-mentioned annotation the writer, after saying "ordinarily a single linear scratch one-quarter inch long is sufficient," goes on to say that "in the presence of an outbreak of variola major three well-spaced incisions may be made to give a more solid immunity." It is difficult to follow his reasoning. Surely in any case—whether in the presence of an outbreak of variola major or not—the highest possible immunity should be one's aim.

After the lapse of more than 100 years since Jenner's discovery it seems strange that there should be no general agreement as to the best way of making the inoculation.—I am, etc.,

Tunbridge Wells.

E. WEATHERHEAD.

\*\* The general decline in the acceptance of vaccination, the mild character of smallpox then prevalent in this country, and the occasional occurrence of post-vaccinal encephalitis led the Committee on Vaccination to issue an Order in 1929 directing public vaccinators to make a single linear insertion, which was calculated to protect against the less virulent virus and unlikely to be followed by untoward sequelae. In the absence of an outbreak of variola major, however, 2, 3, or 4 insertions are advisable in order to give a greater degree of immunity, for collected data about smallpox in vaccinated persons indicate that the degree of protection is proportionate to the area of scarring.—Ed., *B.M.J.*

### Vitamin D in Rheumatism

SIR.—Your annotation on the subject of vitamin D in rheumatism calls to mind a problem in the mechanism of that disease which caused me some difficulty at the time. I had formed a satisfactory hypothesis to account for the similarity between the agents which brought about temporary cure in leprosy—I was looking after some lepers at the time—and those used in rheumatism. This hypothesis was severely shaken by an account which reached me of the work of Dreyer and Reed with vitamin D in rheumatism (1935).

For those who are unfamiliar with the treatment of leprosy it is necessary to state that many agents which are known

to cause a recession of skin lesions in leprosy are similar or identical with those reported to cure rheumatism. As example, intravenous T.A.B. vaccine has its advocates in leprosy. Sometimes a more severe shock—intravenous milk, or dyestuffs of some kind, or a large quantity of salicylate—is used in leprosy. Gold and sulphur injections are popular in the treatment of both diseases. Intercurrent infectious diseases have similar beneficial effects in both leprosy and kala-azar, for example, in leprosy being typhoid and measles or acute hepatitis in rheumatism. In seeking the mechanism of such cures the study of rheumatism, where clinical observation has been more extensive and more accurate, offered great promise.

The one factor which I found common to all the cures that cure rheumatism is that which I have labelled *debility* (1942). Whether it is induced by the accidental trauma of falling down and fracturing a femur or by the more deliberate and calculated procedure of "bone forage" does not matter much, provided it is really severe. Whether a patient gets jaundiced or pregnant the beneficial effects on her rheumatism are the same. So far as his rheumatism is concerned it is a matter of indifference whether the patient suffers from gold poisoning with, say, 5% mortality, or atophan poisoning with 45% mortality; in both cases, whether he lives or dies his rheumatic lesions fade. On the surgical side Leriche started with quite a plausible theory to justify parathyroidectomy or sympathetic ganglionectomy. But the theory was exploded by Simon and Weill, who got the same magical results from a mock parathyroidectomy.

It was becoming evident to me that in leprosy and in rheumatism if you knocked the patient about sufficiently you broke down his resistance—of which the lesion in either case is the anatomical expression—with at least temporary good results. On the medical side the more poisonous the drug the better the result, and by raising the dose it is possible to make the pharmacological properties of all drugs converge to a point where they repress the lesions of rheumatism or leprosy. The surgeon who finds, or imagines he finds, sufficient reason for a major operation to cut out the parathyroid, or pretend to cut it out, to excise the gall-bladder or uterus or other septic focus, to chisel away a piece of tibia, or to remove the lumbar sympathetic ganglia, appears to achieve really good results. But the operation must be a major one. Brutality, it seems, yields better dividends than sympathy and sanatorium regimen in the treatment of rheumatism.

At this stage of my observations I was confronted with an account of the work of Dreyer and Reed with vitamin D in rheumatism. Here, it appeared, was the vitamin which controlled calcium metabolism being used to restore the diseased bone to a state of healthy resistance. This was rather disconcerting from my point of view. The report which I had read like your own account, made no mention of dosage. Park (1938), reviewing the toxicity of vitamin D with special reference to its use in rheumatism, considers that 200,000 units daily is the maximum safe dosage. To achieve results in rheumatism, as I might have guessed, the dosage has to be pushed, in some cases, to 1,000,000 units a day.—I am, etc.,

Albury, Guildford.

WILLIAM HUGHES.

### REFERENCES

- Dreyer, I., and Reed, C. I. (1935). *Arch. Phys. Ther.*, 16, 537.  
Hughes, W. (1942). *Ann. rheum. Dis.*, 3, 89.  
Park, E. A. (1938). *J. Amer. med. Ass.*, 111, 1179.

### The "Extra Pharmacopoeia"

SIR.—I am sorry that Mr. Linstead finds it necessary to protest on behalf of the Pharmaceutical Society against my review of the latest edition of Vol. II of the *Extra Pharmacopoeia*. The most serious part of his letter is the suggestion that my duty was not done conscientiously, and that I deliberately looked for material to give spice to my criticism. Now, I have been using the *Extra Pharmacopoeia* as a book of reference quite regularly for the last seven years, and recommending it warmly to others. I may not know much about it, but that is not because I am unfamiliar with the book. If I boil down the main complaint of my review and put it forward in the most serious manner, I would say that the two volumes are largely spoilt by the inclusion of information of no interest or importance. This amounts to something like 60% of the

tal information in the books. The presence of this matter greatly reduces the accessibility of the remaining 40%, which consists of first-rate material most carefully collected. Here again I would draw a distinction between analytical methods and information about new medicines. The former is very well done, while the latter is much less well done. I expect the main trouble lies with the size and shape of the book. The printing is far too small. Further, although a great deal of work has been done in preparing the book, not enough thought has been given to the general arrangement. The layout of these two volumes needs to be completely recast.—am, etc.,

YOUR REVIEWER.

### Characteristics of Vision in Fine Work

SIR,—The interesting study (March 18, p. 387) by Ida Mann and Dorothy Archibald of a selected group of women employed on extremely fine work draws attention to certain characteristics of vision which are of special importance for the comfort and success of close workers. These characteristics, and in particular the stereoscopic sense and muscle balance at the near point, are not revealed by the reading of Snellen's types, which is sometimes the only test made in the factory when, indeed, any visual selection test at all is applied. The group studied by the authors came into being, as do many similar groups, "by a process of natural selection," and there is reason for believing that much time is now wasted in giving preliminary training to persons who ultimately prove unsuitable for fine work.

Similar groups of persons employed on fine work were studied by Weston and Adams in a series of investigations made for the Industrial Health Research Board during the period 1927-9, the results being published in three reports.<sup>1-3</sup> Their primary aim, however, was to test the value of applying a theoretically probable measure by which the exacting demands made by the work upon the capacity for accommodation and convergence—even when the work is well lighted—would, in effect, be reduced to comfortable limits. This consisted in giving the workers, including those found to be emmetropic and free from phorias, special spectacles with suitable convex lenses and prisms base in.

The groups studied were employed on various fine processes, including linking (hosiery), mounting lamp filaments, and inspecting steel balls for minute flaws. Though most of the workers had long experience and said they were able to do the work without eye-strain, almost without exception, after using the spectacles for some weeks, they reported feeling more comfortable at work and less tiredness of the eyes after the day's work. In nearly every case there was also an increase, often substantial, in their output when the glasses were worn. As might be expected, this increase was generally proportionately greater for persons having errors of refraction or muscle balance, which were also corrected by the glasses supplied, than for persons needing no such correction. Nevertheless, in one process the average increase found was as much as 26% for "normal" persons. The findings in these studies show that the process of natural selection only eliminates the grossly unsuitable individuals. Others, whose characteristics are not so good as they should be—and might be with suitable assistance—carry on with fine work for years, and become so habituated to the strain it occasions that they cease to realize and admit it as such until working without it is experienced.

In their study Mann and Archibald obtained actual dimensions of the task object and the viewing distance in order to establish, on a basis of analysis and measurement, the standard of acuity required for the work. It is encouraging to note this application of scientific method to the problem involved. As yet, a similar procedure has been followed too rarely in dealing with the problems of vision in industry. It was, however, the basis of proposals put forward by Beutell (1934)<sup>4</sup> for determining necessary values of illumination (and, as Lythgoe showed (1932),<sup>5</sup> visual acuity is a logarithmic function of illumination), and subsequently by Weston<sup>6, 7</sup> in connexion with standards of both lighting and vision for industry.

Unfortunately, an easily made slip in calculating the size of the retinal image considered by the authors leads them to give a value which is ten times the true size. The error lies

in the conversion of the dimension of the gap between turns of the spiral filament from inches to millimetres. The true size of the image of this gap is 0.00025 mm., and the visual angle is 3.125 in. The authors mention the angle 24.14 in. as being usually given for the limit of resolvability. Hence, instead of the retinal image of the gap being larger than the resolvable limit, it is actually well below it. However, "Sberrington has found that osmic-stained nerve fibres of 4  $\mu$  diameter are visible to the naked eye,"<sup>8</sup> and, viewed at a distance of 250 mm., an object of this size would give a retinal image of 0.00027 mm. and a visual angle of 3.39 in. It may thus be just possible to see the gap between turns with the naked eye, but certainly the unpractised eye sees a filament of the kind described simply as a single thread and not as a spiral. Using the loupe the authors mention (magnifying about 8 diameters), the image of the gap would be enlarged sufficiently to subtend the limiting angle quoted by them—i.e., about 24 in.

This error, in so far as it affects the authors' conclusion regarding the acuity required for the work, means that a standard better than 6/6—in fact, the best possible—is desirable. There is, however, some doubt whether the detail taken as the criterion of the fineness of the work is really that which the worker normally attempts to discriminate with the unaided eye. Two turns of wire in contact would produce a dark spot in the coiled thread, and, since the diameter of the wire is given as 0.00057 in., such a spot, when viewed at a distance of 250 mm., subtends an angle at the eye of about 25 in. It is probably this, and not the regular gap between two turns of the spiral, which is the "critical" detail. Even so, it remains true that the highest acuity is needed if the work is to be done satisfactorily, and mostly with the unaided eye.

However, it may be inferred from the investigations cited above that even emmetropes with good muscle balance in near vision would derive benefit from the use of convex glasses with suitable prisms for this exacting visual task.—I am, etc.,

London, W.C.1

H. C. WESTON.

### REFERENCES

- 1 Weston, H. C., and Adams, S. (1927). *The Effect of Eyestrain on the Output of Linkers in the Hosiery Industry*. Ind. Fatigue Res. Board, Rep. No. 40.
- 2 ——— (1928). *On the Relief of Eyestrain among Persons Performing Very Fine Work*. Ind. Fatigue Res. Board, Rep. No. 49.
- 3 ——— (1929). *Further Experiments on the Use of Special Spectacles in Very Fine Processes*. Ind. Health Res. Board, Rep. No. 57.
- 4 Beutell, A. W. (1934). "An Analytical Basis for a Lighting Code," *Illuminating Engineer*, 27, 5.
- 5 Lythgoe, R. J. (1932). *The Measurement of Visual Acuity*, Med. Res. Cncl. Spec. Rep. Ser. No. 17.
- 6 Weston, H. C. (1933). *The Relation between Illumination and Industrial Efficiency: 1. The Effect of Size of Work*, Joint Rep. of Ind. Health Res. Board and the Illumination Research Committee.
- 7 ——— (1943). "Proposals for a New Lighting Code," *Trans. Illum. Eng. Soc.*, 8, 2.
- 8 ——— (1943). *Oxford Ophthalmological Congress*.
- 9 Parsons, Sir J. H. (1927). *An Introduction to the Theory of Perception*, p. 185, Cambridge.

### Intelligence and Season of Conception

SIR,—Mr. Penman (April 1, p. 471) points out that Fitt and others have shown that there is an association not only between season of conception and intelligence but also between season of conception and such things as stature, weight, hand-grip, and infant mortality. But he is in error in supposing that this is an objection to the argument of my paper (March 4, p. 320). It is, on the contrary, just what would be expected, because it is well known that these things are positively correlated. What is true of one is likely to apply to all. Mr. Penman might like, however, to have a few figures illustrating these associations from the group of children who provided the data. The correlation between intelligence and stature in a sample of about 800 was of the order of +0.2. In regard to the association between intelligence and early death figures are available for three samples: (1) the brightest 4%; (2) the median 4%; (3) the dullest 8%. The results are as follows:

	Group 1	Group 2	Group 3
Average number of living full sibs ..	1.95	3.54	5.63
Average number of dead sibs ..	0.13	0.32	0.53
Average number of stillbirths ..	0.03	0.10	0.17

\* When all mothers have passed the age of 50

In view of the method of ascertainment the true family size is given approximately by the number of sibs, omitting

in each instance the child who brought the family into the experimental group. Thus the mothers of the dumbest children have 2.6 times as many living children as the mothers of the brightest. But they had 4.0 times as many who died before the observations were made and 5.6 times as many stillborn children.

The superiority of winter children demonstrated in the mass studies is to be ascribed to the slight tendency for more intelligent parents to have proportionately more children conceived at that time. Moreover, it is likely to be found that this applies to physique as well as intelligence. It is, of course, possible that this larger effect might mask a smaller one due to a direct seasonal influence on the mother or the developing child. Should this prove true the effect could be in either direction, and, to hazard a guess, it would not be surprising to find (if season of conception does have any direct influence) that for the child of any particular pair it is spring-summer conception which is the more favourable. In this matter it is the less intelligent (and those of poorer physique) who approach more closely to what must be presumed to be the remnants of the natural rhythm. It is difficult, however, to imagine any convincing proof of a direct effect due to season of conception which does not depend on showing that children conceived during a particular season are superior to their brothers and sisters conceived at another.—I am, etc.,

London.

J. A. FRASER ROBERTS.

### Chronic Pulmonary Catarrh in Childhood

SIR,—In the words of Chevalier Jackson "all is not asthma that wheezes." Taylor (April 1, p. 453) has described a condition in children simulating asthma which he calls "chronic pulmonary catarrh." It is probably the commonest pulmonary condition met with in children who almost invariably give a history of previous lung infection such as pneumonia, measles, or whooping-cough. The condition in the lung is probably comparable to chronic tonsillar infection with cervical adenitis, with which it is often associated, and methods of treatment outlined by Taylor must be tried in an attempt to prevent the attacks occurring while the chest cage is soft and easily deformed. These can best be given at an open-air boarding-school, but unfortunately, owing to lack of accommodation in these schools at the moment, length of stay is usually confined to six months or less. This is quite useless for these "chesty" children, who immediately revert to their attacks on returning home. Although the trouble may not start as a psychological problem, it soon becomes one if the child remains at home in the surroundings of over-anxious parents. I would like to see a sufficient number of open-air boarding-schools established to accommodate these children during their scholastic years, when I believe a high percentage would have few or no further attacks, and be launched on the world with healthy well-formed chests.—I am, etc.,

London, N.W.

C. ELAINE FIELD.

### Marriage and Parenthood

SIR,—Now that the country is becoming alive to the importance of the family unit it is time that the medical profession concerned itself more positively with the prevention of marital disharmony. There are two periods in marriage when much may be done: at the beginning and after the first child is born.

While we pay much lip service to the importance of suitably adjusted partners we do little to encourage their creation, so that far too many marriages go wrong through lack of preliminary teaching. Adequate marriage preparation—which should include the medical examination of both partners, an assessment of their psychological approach to marriage, the state of the hymen, suitable contraceptive advice when desirable, and, above all, education in technique—ought to be taken more seriously by the profession, for there can be little doubt that the seeds of much future unhappiness are often sown in the early months of marriage through ignorance and misunderstanding.

Many conditions such as dyspareunia, impotence, premature ejaculation, and frigidity could be prevented or minimized by a little helpful advice and consideration at this stage. Young people must be encouraged to seek this advice, and the doctor has both a responsibility and an opportunity for much con-

structive work in this field. More and more couples are asking for help, and yet it is no uncommon thing to find cases which are mishandled and no constructive advice is given. The assurance that all will come right in the end; the suggestion that one or other contraceptive, of which the doctor has read or heard good reports, will be an adequate safeguard; the rapid and often painful examination of the hymen or, occasionally, even the refusal to make such an examination, are neither sufficient nor helpful, and cast an unnecessary slur upon the whole profession. Over and over again one hears people say that their doctors are not interested in these matters.

After the first baby has arrived the couple have various adjustments to make. The problem of effective contraception may present itself for the first time; the resumption of coitus often needs consideration and sympathetic help; the achievement of a mutually satisfactory sex life and the emotional adjustments between mother, father, and child call for careful guidance. While much time is often spent on the problem of mother and child, little is given to those of the husband and wife. Beyond telling the woman that her sex organs have "gone back" to their normal position, that she must take care of herself and not have another child for several months, little constructive help is given. As a result many of the difficulties already enumerated develop or become accentuated. Adequately dealt with all may be well; ignored or glossed over an accumulation of difficulties may create a state of disharmony which will take longer to resolve or even become impossible to correct.

The work of probation officers, matrimonial courts, and such organizations as the Marriage Guidance Council shows conclusively that many of these conditions could have been prevented by adequate medical help and effective re-education thereby not only preventing much physical and psychological injury but saving the marriage and establishing happiness in the home instead of discord.

If the profession would take these matters more seriously and help young couples at these critical periods of their lives many marriages could be saved and the whole stability of family life strengthened. In addition, and as a preliminary to marriage preparation, we must see to it that young people both in the home and in school and youth organizations, are presented with a positive attitude to sex and marriage through effective education in the psychological, physical, and ethical aspects of sex.—I am, etc.,

London, W.1.

EDWARD F. GRIFFITH.

### Eye Signs of Anaesthesia

SIR,—I have often seen references to eye-rolling and other movements of the eyes in connexion with inhalation anaesthesia, but have never noticed any eye movements described as nystagmus. I am interested to notice in Dr. E. V. Slaughter's letter (March 25, p. 434) his observations on the development of occasional coarse oscillations.

I have had the opportunity to watch the eyes of children who are being anaesthetized in the upright position with ethyl bromide. In these cases one invariably finds that a tri-vestibular nystagmus develops just before full anaesthesia is reached. This vestibular nystagmus is almost always in the vertical plane, and the slow phase may be in either direction. Very occasionally it is slightly oblique. The eyes pass into conjugate deviation, usually in the direction of the slow phase before coming to rest in a central position, as described by your correspondent. Now, all nystagmus of a vestibular pattern must be the result of irritation of the vestibular system; hence the drug employed must irritate either the vestibular centres or tracts, the vestibular nerve, or the labyrinth itself. Skoog of Lund has shown that vestibular nystagmus can be produced by anaphylactic substance, carried direct to the vestibular centres, in the guinea-pig.

Perhaps the anaesthetists could make a careful investigation into these eye movements to see whether vestibular irritation is not apparent with all inhaled anaesthetics. This irritation must take place at a fairly constant level of anaesthesia, and I feel that there is some justification for looking on certain eye movements as an indication of the depth of anaesthesia.—I am, etc.,

Glasgow.

TOM O. HOWIE.

## Obituary

We regret to announce the death on March 26 at Weston-super-Mare of Dr. GEORGE SAMUEL POLLARD in his 85th year. He was a J.P. for the county of Somerset, had practised in Midsomer Norton and its neighbourhood for 43 years, and was a greatly esteemed member of the Bath and Bristol Branch of the B.M.A., which he joined as long ago as 1885. Dr. Pollard had his professional training at Guy's Hospital, and took the M.R.C.S.Eng. in 1882 and the L.R.C.P.Ed. in 1884, after which he was medical registrar at the Seamen's Hospital, Greenwich. He started practice at Midsomer Norton in 1885, and besides his work as a busy general practitioner he held the post of M.O.H. for the urban area and was for 23 years medical director of the Paulton Hospital. He was also medical officer to Downside Abbey and School. His many activities, professional and other, were commemorated in 1929 when a public presentation was made to him at the time of his retirement: the record is too long to be printed here; few doctors in active practice could have accomplished so much in so many directions. In the British Medical Association Dr. Pollard did good work, mainly in his own county, but many years ago he was for a time a member of the Central Council. He had held office as vice-chairman and chairman of the Bath Division and served on its executive committee. He was a member of the Bath and Bristol Branch Council for 10 years in all and president of the Branch in 1922-3. He celebrated his golden wedding in 1940, and Mrs. Pollard survives him.

Dr. ARTHUR BRIGGS DUNNE, J.P., died on March 27 at Barnby Dun, near Doncaster. He took his B.A. at Cambridge in 1891 and did not begin the study of medicine until some years afterwards. His clinical training was in Leeds and Liverpool. He qualified in 1899, took the Cambridge M.B., Ch.B. in 1902 and the D.P.H. a year later. At Leeds he won the McGill scholarship in surgery and he was called to the Bar by Lincoln's Inn. During the South African War he served as a civil surgeon with the S.A. Field Force, and after his return to England became senior resident medical officer to the City of Liverpool Isolation and Smallpox Hospital. In 1911, after a period as senior school medical officer to the City of Nottingham, he was appointed medical officer of health to the Doncaster Rural Council; in the same year he became M.O.H. for the Bentley Urban District and in 1915 for the Adwick-le-Street Urban District. In 1920 Dr. Dunne was appointed a West Riding magistrate and thereafter attended regularly on the Bench. He retired from his public health posts five years ago.

ALEXANDER ANNAND GREY CLARKE died on March 29 after a short illness at the early age of 34. He was born in India, educated at Marlborough College, and took the B.Sc.Lond. in 1929 when he was aged 19. He then proceeded to Jesus College, Oxford, where he studied forestry, but later became a medical student at St. George's Hospital. After qualification he held the post of casualty officer and house-surgeon at the hospital, took the M.B., B.S. degrees, and was commissioned as surgeon lieutenant, R.N.V.R., early in 1939. On mobilization at the outbreak of war Dr. Clarke was posted to H.M.S. *Courageous*, in which he was serving when his aircraft-carrier was torpedoed and sunk in September, 1939. He was rescued after some two hours in the sea, and subsequently senior naval officers paid tribute to his courage and devotion to duty in dealing with casualties among the survivors. A few months later Dr. Clarke developed meningitis, following recovery from which he was invalided from the Service. He then devoted himself to neurology and psychiatry, and after acting as assistant medical officer at Swansea and Littlemore (Oxford) Mental Hospitals, he took the Diploma of Psychological Medicine in 1941. Early in 1942 he was appointed medical registrar to the West End Hospital for Nervous Diseases, London, where he continued to work until his last illness. He was also an acting assistant physician to the Midday Memorial Hospital as well as to psychiatric clinics for children in the Surrey County area. Dr. C. Worster-Drought writes: Alex Grey Clarke was an ideal colleague, a loyal friend, and an enthusiastic worker. His attractive personality, his charm of manner and ready smile will be greatly missed by all his fellow-workers and his patients. He was profoundly devoted to neurology and was especially interested in the more recent therapeutics of early psychoses. Only last year (in conjunction with Dr. F. Prescott) he contributed a paper on the mental and physical manifestations of vitamin B deficiency to the *British Medical Journal*. With his far from robust constitution, the amount of time and energy Alex Clarke put into his work, as well as reading for higher examinations, without doubt lowered his resistance to the

infection which cut short a most promising career and one the medical profession could ill afford to lose.

We regret to announce the death of Dr. JAMES DUNLOP WILLIAMSON, M.D., D.L., J.P., a noted figure for many years in the medical and civic life of Belfast. Born at Aghadowey, Co. Derry, Dr. Williamson qualified in 1886 in the old Royal University of Ireland, gaining the degrees of M.D., M.Ch., M.A.O. Two years later he took up general practice in Belfast, later joining the staff of the Ulster Hospital for Children and Women, of which he remained the consulting physician till his death. His long and distinguished period of service to the City of Belfast began in 1900 when he was elected a Councillor. He became High Sheriff and in 1941 deputy Lord Mayor. He served for many years on the Public Health, Tuberculosis, and Maternity and Child Welfare Committees of the Corporation, and his interest in public health led to papers on sanitation and sewage purification. His services to Belfast were recognized when he was made a Freeman of the City a short time before his death. Dr. Williamson had been a member of the British Medical Association for 56 years.

Prof. Grey Turner writes: Dr. FRED B. LUND, who has recently died in Boston, was one of the more senior surgeons of that city, for he was born in 1865 and graduated from Harvard in 1892. For many years he had been associated with the Boston City Hospital and was well known for the work he did in connexion with that institution and his devotion to its welfare. Fred Lund was of a scholarly type and was particularly fond of the study of the history of healing. He made several contributions to the societies and the medical press on historical subjects, and his paper on "Paracelsus," which appeared in the *Annals of Surgery* for October, 1941, will remain as an evidence of his learning and interest. Just recently he informed me that once again he was reading the works of the Venerable Bede, and I looked forward to the opportunity of acting as, his guide on a long-contemplated visit to the home of that great pillar of early English learning at Jarrow-on-Tyne. He loved this country and was very happy indeed in making acquaintance with those parts of England and Scotland with which he had become familiar through our literature, and was longing to be spared to make just one further visit. Lund accompanied the Society of Clinical Surgery of America to this country in 1910 and acted as its reporter, and from then onwards he kept in friendly touch with many of the leading surgeons of Great Britain. In his home city he took a great interest in the medical societies and had been president of both the Massachusetts Medical and the Boston Surgical Societies. To the *Transactions* of these bodies he often contributed, and as a rule on some historical subject. Lund was an original Fellow of the American College of Surgeons and a member of several of the societies: he also took a great interest in the *New England Journal of Medicine*. He was a great host and loved to entertain his friends, and liked nothing better than to show visitors from this side the venerable parts of Boston, of course never forgetting the ether theatre in the Massachusetts General.

## Medical Notes in Parliament

### EDUCATION BILL

#### Medical Inspection and Treatment

In Committee on the Education Bill on March 23 the House of Commons examined Clause 46 (Medical Inspection and Treatment of Pupils). Mr. Linstead moved to add "dental and optical" where the clause referred to "medical." The country as a whole would long suffer from a shortage of dentists. There were only 650 medically qualified ophthalmic practitioners for over 5,000,000 school children. Many defects of vision were missed. That raised the question whether the services of sight-testing opticians should be used to supplement the services of the ophthalmologists. Dr. HADEN GUEST supported Mr. Linstead provided that if people not medically qualified were to make examinations this should be regarded as a provisional arrangement.

Mr. BUTLER said the school medical services would be better if there were more doctors, but they had to suffer from the needs of the Armed Forces. In many areas it was the practice for an optician to attend with the ophthalmic surgeon when children's eyes were examined. Opticians were not doctors, and he must insist that the general examination of children for eye troubles should be done by ophthalmologists and not by somebody solely concerned with the making up of prescriptions. Captain PRESCOTT said he was informed that inspection of eyes in the school was often now done by a nurse or even by a



teacher. There were 7,000 opticians and they would be of great value if employed, at least in part, for this purpose. Mr. BUTLER reaffirmed that the Ministry could not substitute opticians for ophthalmologists in important cases. They were used and would continue to be used.

Mr. Linstead withdrew his amendment.

Sir E. GRAHAM-LITTLE moved and withdrew an amendment which proposed that the Act should not be construed as imposing an obligation on any parent to submit his child to medical examination or treatment. On this Mr. Butler remarked that compulsory inspection was a novelty, but one to which he attached particular importance. He proposed and the House accepted an amendment to provide that if the parent of any pupil gave to the authority notice that he objected to the child's availing himself of any medical treatment the pupil should not be encouraged or assisted so to do.

On the motion that Clause 46 stand part of the Bill, Dr. HADEN GUEST suggested that Mr. Butler should insert later a provision that a medical inspection should be made not fewer than three times in the school career. He also asked Mr. Butler to consider the possibility of a new clause to give the school medical officer the opportunity to inspect the child's home conditions if he thought its state arose from something within the home. It was important to see that there was adequate sleeping accommodation for the child. In the course of his duties he had often unofficially entered homes and had never been refused by parents. Mr. BUTLER said the Government preferred to leave the Bill as drawn. A large majority of the children were covered in some way in the routine of inspections in a normal year before the war. The Government did not think it right to impose an extra duty on the school medical officer to go into people's homes. Under Clause 73 a school doctor could go into the home of a child having a disease so serious that it was impossible to educate the child at school.

Sir E. GRAHAM-LITTLE asked what would be the position of the family practitioner if the arrangements in this clause were carried out. If the inspection and treatment of children from 2 to 18 was to be the function of the school medical officer, without any reference to the family practitioner, an unfortunate position would arise. So great a step in the medical treatment of children should not be taken until Parliament had further knowledge of what would happen to the general health service.

The House then agreed to the clause.

#### *Position in Non-Maintained Schools*

During the continued discussion on March 28 Mr. EDE moved an amendment to Clause 73 to make arrangements by which the proprietor of any non-maintained school could secure the benefits of medical inspection and treatment. Dr. HADEN GUEST said there was no doubt that some small private schools badly needed the medical inspection and treatment, and also some public schools. He asked what steps the Board of Education proposed to take to see that there was such inspection in these schools.

Mr. EDE pointed out that the Bill gave the Board the power, for the first time, to inspect the kind of schools Dr. Haden Guest had mentioned. If they found that a school was being used, as it sometimes was, in order to object to such things as medical inspection and treatment—he was now talking of the worst types of private schools—that might be one of the items on which a report could be made by the Board. They would expect the proprietor of the school, within the limit of six months allowed, to make such arrangements as were necessary to secure the benefits of medical inspection for the pupils attending his school. Similarly, if meals were not provided where they should be, the same kind of machinery would be brought into operation. Dr. HADEN GUEST asked if it would be possible for a school to refuse to have medical inspection, and Mr. Ede replied that if it did, that might very well be a ground, under the Private Schools Clause, for bringing it before the tribunal, with a view to having the school closed. The amendment was agreed to.

#### *Vaccination*

On Clause 74 (which makes supplementary provisions with regard to medical inspection and treatment) Mr. VIANI moved an amendment to ensure that nothing in the Bill should be used for ascertaining the vaccinal condition of the children or their condition in respect of any other form of inoculation, for securing the performance of such inoculations, or for the imposition of mass radiography or any other medical procedure. He said there was considerable apprehension among many parents about the powers which were being conferred on the Board of Education in regard to medical inspection and treatment. There was nothing like unanimity of opinion, even in the medical profession, about vaccination and inoculation. Dr. HADEN GUEST expressed the hope that the Minister would not accept the amendment, which was so widely drawn that it would create considerable difficulties. Mr. MESSER expressed

the hope that the Board would consider the advisability ensuring that medical examination should include mass radiology.

Mr. EDE said that the amendment was not necessary. Nothing would be done under the clause or in the Bill to compel a child to be vaccinated or inoculated, or to undergo any of the other procedures mentioned in the amendment, without the consent of the parent. The amendment was withdrawn.

#### *Malnutrition in Occupied Countries*

The ARCHBISHOP OF CANTERBURY, in the House of Lords March 15, asked for information about the supply of food enemy-occupied countries. He said that what had been done in Greece had probably saved the lives of 2,000,000 people. He proposed that in Belgium the Allies should supply the medical requirements to prevent serious deterioration of health. He understood that vitamins were treated as medical supplies, and that it was possible to pass them through, whereas dried milk was treated as food. In Poland it seemed that children up to the age of 3 were tolerably well fed, in order that they might be German citizens in future. In Greece 1,800,000 children needed swift help; in Holland about 300,000; in Poland 3,500,000; in Czechoslovakia 1,600,000; in Yugoslavia 2,100,000. These were figures for young children.

Lord HORDER said clinical examination of refugees reaching this country or Lisbon showed conditions only produced by prolonged malnutrition, including hunger oedemas. The calorific value of a day's food required for health was 2,480. In September, 1943, the basic daily ration in Belgium was about 1,260 calories—about half the ration in that country during the war of 1914-18. In France the calorific value at the end of 1943 was about 1,080. Children in Belgium under 6 years received supplements. These were withdrawn at 6. Adolescents from 14 to 21 were suffering most. Adults, according to a large investigation of the Liège Polytechnic, had lost 20 to 34 lb. weight, and protein substances in the blood showed a fall of from 20 to 50%. Pregnant women showed a drop of 80% in the normal weight gain, and infants at birth an average drop in weight of 2.2 lb. Students, nurses, and hospital personnel showed malnutrition. In Belgium, between December, 1941, and February, 1943, the rise in the incidence of tuberculosis was 58.5%. Fulminating pulmonary tuberculosis was to-day experienced in Belgium, France, and Greece. He understood the Nazis had not prevented the food supplies sent to Greece from reaching the people for whom they were intended. Why not try elsewhere?

The EARL OF SELBORNE, replying for the Government, said that the Government had endeavoured to mitigate the effect of the blockade to its allies. It had taken vitamin D off the contraband list. Occupied Europe was one economic unit and was worked by the Germans as such. Therefore he knew no reason why relief should be confined to Belgium. In that country in 1914 the death rate per 1,000 was 14.14. By 1918 it was 20.82. In 1939 it was 14.14; in 1942 it was 14.3. For the first half of 1943 deaths were at the rate of 13.0 per 1,000, although the Germans had deported the strongest and healthiest section of the community. In 1929 the infant mortality rate in Belgium was 104 per 1,000; in 1939, 73 per 1,000; and in 1942, 78. It was impossible for anybody in Europe, or in any other country, to control the distribution of food to necessitous cases. Could a reasonable man doubt that the Germans would avail themselves of the amount of food going into a country in order to manipulate the basic ration so that the benefit of the imported food rebounded to them? Allied experience in Greece had not been such as to encourage the British Government to think that control of that kind would be easy to administer in other parts of occupied Europe. But if circumstances allowed the British Government to mitigate the lot of its allies without injuring its war effort, it would gladly take advantage of the opportunity.

#### *Maternity Accommodation*

Mr. WILLINK stated, in the course of a reply on March 30, that in 1938 there had been in England and Wales 11,500 maternity beds. To-day there were 15,500 and also 2,500 emergency maternity beds. In addition, 500 other beds had been approved. The beds available before the war took approximately one-third of the births. Those at present available took one-half of them. That was equal roughly to the all-over increase in demand.

#### *Serving Doctors' Practice Losses*

On April 4 Sir E. GRAHAM-LITTLE asked the Secretary of State for War if he was aware that many doctors on joining the Forces in 1939 lost their practices which, in many cases, they had purchased with the aid of loans, charges on which they had to meet out of Service pay; and if he would give an assurance that in such cases compensation would be paid after the war equal to the pre-war value of their practices. Sir

IN ANDERSON, who replied, said: Losses of this nature affect many different sections of the community are among the stressing consequences of a war such as that in which we are now engaged, and I clearly could not single out one particular class of case for exceptional treatment in the manner proposed.

#### Increase in Illness among Women Civil Servants

On April 4 Mr. BARTLETT asked the Secretary to the Treasury what extent information in his possession corresponded with the common experience of medical practitioners that there had recently been an increase of illness among women civil servants due to fatigue; and whether he would be prepared to authorize heads of Departments to exercise discretion in suitable cases for the reduction of hours in modification of instructions given at a time when the national crisis was in its most acute stage. Mr. ASHETON: Owing to shortage of staff complete annual sick rate returns for the Civil Service are not available. Such information as I have shows definite increase in sick absence over pre-war rates, and on the whole greater increase for women than for men, but the increase varies in different sections and localities, and is not, over all, very great. Heads of Departments have discretion in regard to hours, but, in view of the acute and increasing man-power shortage, they are not able to reduce hours generally.

#### Notes in Brief

Mr. Peat stated on March 2 that during recent weeks there had been a substantial increase in the supply of sulphathiazole available or civilian use. Production should now be adequate to enable all prescriptions to be met. It was now available, on a prescription, to everybody.

Mr. Willink proposes to issue a summary report of the Ministry of Health for the year ending March 31, 1944, but is unable at present to indicate the date.

The number of doctors in the *Medical Register* at the end of last year was 71,882. This figure includes many who are not normally resident in the United Kingdom or who have retired from practice, as well as those registered, temporarily or otherwise, by virtue of Empire or foreign qualifications.

In the House of Lords on March 1 the Income Tax (Offices and Employments) Bill and the Disabled Persons (Employment) Bill received the Royal Assent.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In England and Wales notifications of measles and whooping-cough showed the greatest fluctuations, with totals higher than last week's by 531 and 218 respectively.

The rise in whooping-cough was general throughout the country, but was especially marked in Essex and Flint, where the total notifications exceeded those of last week by 31 and 24. The increase in measles was most noticeable in the south, especially in Kent, Isle of Wight, London, and Sussex, whose total notifications exceeded those of last week by 111, 84, 77, and 35 respectively. Durham also recorded a big rise—47—over last week's total. In Lancashire the notifications of measles dropped by 64. The total notifications of cerebrospinal fever were 14 more than last week, and the incidence of this disease is at its highest level for the past year.

There were 5 more cases of dysentery: during the past seven weeks the notifications have averaged 243 per week. The largest returns were those of Lancashire 62, London 32, Derbyshire 32, Surrey 26, Middlesex 16, Essex 11, Yorks West Riding 10.

Two cases of smallpox have been reported in Pudsey, Yorkshire.

In Scotland there were rises of 19, 32, and 34 in the total incidence of dysentery, measles, and scarlet fever, but a fall in incidence was reported for whooping-cough 26, and diphtheria 13. The 136 cases of dysentery were only 5 below the very high total of six weeks ago. The largest returns were: Lanark County 36, Glasgow 36, Edinburgh 15, Dumfries County 15, Dundee 12. The only large local variations in the incidence of measles were increases in the towns of Greenock of 35, and Paisley of 26, and a decrease in Glasgow of 33.

In Eire rises in the notifications of diphtheria by 24, and of measles by 78, were recorded. The rise was general throughout the country except in Dublin C.B., where measles declined by 37 cases.

### Week Ending April 1

The returns of infectious diseases in England and Wales during the week included: scarlet fever 2,450, whooping-cough 2,141, diphtheria 724, measles 2,643, acute pneumonia 1,277, cerebrospinal fever 86, dysentery 309, paratyphoid 0, typhoid 5, smallpox 1. Deaths from influenza numbered 32.

No. 12

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or not return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	101	13	16	6	4	101	8	31	3	5
Deaths .. ..	—	1	1	—	—	—	2	2	—	—
Diphtheria .. ..	666	32	174	107	41	816	37	207	91	25
Deaths .. ..	10	—	5	4	—	21	2	1	—	—
Dysentery .. ..	274	32	136	—	1	92	10	37	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	—	—	1	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	1	—	—	—
Erysipelas .. ..	—	—	43	21	3	—	—	50	15	13
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	4	—	—	—	—	18	—
Deaths .. ..	52	5	12	13	3	56	5	3	15	7
Measles .. ..	2,757	363	377	374	5	19,561	1,329	718	—	117
Deaths .. ..	—	—	1	6	—	18	6	5	—	—
Ophthalmia neonatorum .. ..	82	3	21	1	2	96	5	27	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	6	—	—	—	—	1	—	3	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,270	86	11	7	8	1,505	80	12	16	—
Deaths (from influenza) .. ..	44	2	4	2	1	73	7	2	1	—
Pneumonia, primary .. ..	—	—	270	38	—	—	—	281	33	9
Deaths .. ..	—	70	18	26	—	—	—	19	15	—
Polio-encephalitis, acute .. ..	2	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	7	—	—	—	—	4	—	—	1	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	3	21	—	—	—	1	5	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia* .. ..	170	10	22	4	2	191	7	10	2	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,389	169	281	29	82	2,185	156	262	53	39
Deaths .. ..	1	—	—	—	—	4	—	—	—	—
Smallpox .. ..	1	1	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	9	—	—	11	3	6	—	5	5	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	7	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,244	222	104	94	11	1,982	186	224	75	32
Deaths .. ..	10	4	6	—	—	19	1	1	2	—
Deaths (0-1 year) .. ..	451	63	84	58	28	469	55	62	40	42
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	5,500	1,028	631	325	160	5,269	889	606	252	143
Annual death rate (per 1,000 persons living) .. ..	—	—	14.5	21.2	—	—	—	13.7	16.6	—
Live births .. ..	7,467	859	959	446	274	6,410	786	897	410	349
Annual rate per 1,000 persons living .. ..	—	—	19.5	29.1	—	—	—	18.3	27.0	—
Stillbirths .. ..	257	28	31	—	—	252	19	37	—	—
Rate per 1,000 total births (including stillbirths) .. ..	—	—	31	—	—	—	—	40	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## The Services

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held on Friday, April 28, at 3 p.m., at the Medical Department of the Navy, 64, St. James's Street, London, S.W., to elect six Directors of the Fund.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Capt. S. D. Stock, R.A.M.C., in recognition of gallant conduct in carrying out hazardous work in a very brave manner.

### CASUALTIES IN THE MEDICAL SERVICES

*Wounded.*—Temp. Lieut.-Col. G. S. N. Hughes, I.M.S.; War Subs. Capt. J. W. R. Battram, R. A. S. Gibb, B. C. M. Palmer, R.A.M.C.

*Prisoners of war.*—Temp. Major P. V. MacGarry, R.A.M.C.; Acting Major E. L. Ellis, R.A.M.C.; War Subs. Capt. J. E. A. Bartlett, D. Benson, C. F. Campbell, G. M. Davies, T. E. Marshall, C. R. Robson, and R. D. Taylor, R.A.M.C.; Lieut. J. Markowitz, R.A.M.C.

*Died on active service.*—Lieut.-Col. F. A. Roddy, R.A.M.C.

## Universities and Colleges

### UNIVERSITY OF EDINBURGH

#### Chair of Public Health

As briefly announced in the *Journal* of April 1 the University Court has appointed to the Bruce and John Usher Chair of Public Health Prof. F. A. E. Crew, M.D., D.Sc., F.R.C.P.Ed., F.R.S., in succession to Prof. P. S. Lelcan. Since 1928 Prof. Crew has occupied the Chair of Animal Genetics; in recent years he has devoted attention to the problems of social biology and social medicine, and his appointment to the Bruce and John Usher Chair marks an important new development in medical teaching and research in Edinburgh.

For many years after the Public Health Services became an established feature of national administration, the orientation of these services was mainly towards prevention of the specific infectious diseases, and the teaching of public health in the medical schools became centred on environmental hygiene and the control of infection. While the medical undergraduate must be taught the elements of these subjects, instruction in the technicalities of public health practice is a subject for postgraduate study, and in recent years the need for a different approach to the study of health in the undergraduate curriculum has been appreciated. The developments in the health services forecast in the Government White Paper indicate that medicine must play an ever-increasing part in the future social life of the people, and a new outlook has emerged under the designation Social Medicine. It is not enough to protect the public individually and collectively against the epidemic diseases, but health of body and mind must be created and preserved by all possible means. Many adverse factors in modern society, particularly among the industrial population, are playing a tremendous part both directly and indirectly in causing ill-health and unfitness. Advances in knowledge of nutrition in relation to social conditions have revealed certain of these factors. The facts recently brought to light on infant mortality in Scotland are a tragic reminder of the existence of such adverse conditions in the social life of the people.

In the future medical curriculum in Edinburgh it is proposed to develop the teaching of these aspects of medicine—namely, social biology, social medicine, and positive health. The task of developing such teaching has been entrusted to Prof. Crew, who will bring to his future academic work a wide knowledge of biological science, on the principles of which all health studies must be based, and a deep interest in the problems of social biology and medicine. Along with this new teaching on health the undergraduate will receive instruction as before in the elements of environmental hygiene, public sanitation, and the control of communicable diseases. By arrangement between the University and the Corporation of Edinburgh, the Medical Officer of Health, Dr. W. G. Clark, and the staff of the Public Health Department of the City will undertake the main part of this teaching in co-operation with the new professor; and in the postgraduate curriculum for the D.P.H., Dr. Clark and his staff will be responsible for all the technical instruction in public health practice and administration. The teaching to be undertaken by Prof. Crew and that of Dr. Clark will be complementary, and both courses together will form the basis of future teaching in Edinburgh in the wide field of health and social medicine. In creating and developing this University School of Health other academic departments will contribute, such as those of Child Life and Health, Tuberculosis, Psychiatry, Social Study.

### ROYAL FACULTY OF PHYSICIANS AND SURGEONS

At a meeting of the Royal Faculty of Physicians and Surgeons Glasgow held on April 3, the President, Dr. James H. MacDonn, in the chair, the following were admitted Fellows of Faculty (Physician): W. S. Bell, M.B., T. G. Brown, M.B., D.P.H., P. Peacock, M.B., W. N. Rogers, M.D., W. T. Strauss, M.D.

The following were admitted Fellows of Faculty *qua* Surgeon G. B. Mair, F.R.C.S.Ed., G. H. Stevenson, F.R.C.S.Ed.

## Medical News

The London Jewish Hospital Medical Society and the Jewish Emergency Medical and Dental Association will show a film entitled "Red Army Medical Service" in the Hastings Hall at B.M. House, Tavistock Square, W.C., on Sunday, April 16, at 3 p.m. Speakers: Prof. S. Sarkisov (Russia), Prof. Samson Wright, and Mr. Ingram Lindner.

A meeting of the London Association of the Medical Women's Federation will be held at 26, Portland Place, W.1, on Tuesday, April 18, at 7.45 p.m., when Dr. Neville Goodman will speak on "Problems of Health in Europe." Medical guests are invited. A meeting on the White Paper is being arranged for May.

The British Institute of Radiology will hold a meeting of medical members in the Reid-Knox Hall, 32, Welbeck Street, London, W.1, on Friday, April 21, at 2.30 p.m. On April 22 at the same hour Dr. J. Blair Hartley will read a paper on "The Future of Radiology in Obstetrics."

A Diagnosis Section meeting of the Faculty of Radiologists will be held at the Royal College of Surgeons of England, Lincoln's Inn Fields, W.C., on Saturday, April 22, at 10.30 a.m., when papers will be given by Major D. C. Eaglesham, R.C.A.M.C., on "Observations on Opaque Myelography of Lumbo-sacral Disk Herniations," and Dr. A. M. Raekow on "Some Problems of Appendix Radiology," to be followed by a discussion.

The Food Education Society will meet on Monday, April 24, at 3 p.m. at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., to hear a public lecture on "Food and the Teeth" by Sir Norman Bennett.

The spring meeting of the British Orthopaedic Association will be held in Leeds on Friday and Saturday, May 12 and 13. The morning session (9.15 a.m.) on Friday—to be held in the Physiology Lecture Theatre at the Medical School—will be devoted to papers read by Leeds men. In the afternoon (2 p.m.) there will be a clinical demonstration at the Infirmary by members of the staff. On Saturday (9.15 a.m.)—again in the Physiology Lecture Theatre—a business meeting will be followed by the reading of short papers by medical officers in the American and British Armies.

There has been formed a Polish Medical Association in the United Kingdom with its seat in London. At a general meeting held on March 26 in the Great Hall of B.M.A. House, to which about 400 Polish doctors now in this country were invited, the following were elected: Hon. President, Dr. George de Swiet; Chairman of Council, Dr. C. Meissner; Secretary, Dr. B. Jedlewski. The address of this organization is B.M.A. House, Tavistock Square, W.C.1.

The Council of Management of Preston Hall, British Legion Village, Maidstone, Kent, has appointed Dr. J. Douglas Robertson D.Sc., Ph.D., M.R.C.P., F.R.S.Ed., as clinical pathologist to the British Legion sanatoria, and Mr. A. T. Fripp, F.R.C.S., as visiting orthopaedic surgeon in connexion with the new wing at Nayland Sanatorium, which will accept female patients with non-pulmonary conditions for treatment.

Major Sir Brunel Cohen has given £1,000 towards the cost of a x-ray unit at Nayland Sanatorium which was taken over by the British Legion on May 1, 1943. It is proposed to establish the unit in the new treatment centre which will be built as soon as permission is obtained for its erection. Sir Brunel Cohen has for long been identified with the work of the British Legion in this country, is Treasurer of the British Legion, a former Member of Parliament and himself a severely disabled ex-Service officer from the last war.

Lord Nuffield and the Trustees of the Nuffield Foundation have authorized grants amounting to approximately £9,000 to the Potato Research Scheme. The production of varieties resistant to disease is work of the highest importance to this country, and other countries in the Empire need varieties suited to their conditions. Scientific work has shown that these diverse qualities desired must be sought among potatoes indigenous to Central and South America. A very large collection of such types, wild and cultivated, has been formed at the School of Agriculture, Cambridge, and scientific investigation of them started.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Antology Western*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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### ANY QUESTIONS?

#### More about the Rh Factor

**Q.**—I have a patient aged 30 whose first child was normal in all respects. Her second baby died of haemolytic disease of the newborn. She was advised by her doctor at that time not to have any more children. She is keen to have another child, and I feel that there is an even chance of its being born normal, and should it show any signs of haemolytic disease it stands a very good chance of survival as a result of recent advances in our knowledge. What advice should I give?

**A.**—If the father is heterozygous (Rh<sup>rh</sup>) there should be an equal chance that any subsequent pregnancy will produce an Rh-negative normal baby, although the birth of a normal child immediately after one suffering from haemolytic disease is said to be uncommon. If the father is homozygous (Rh<sup>rh</sup>) every child born subsequently will be affected; the first child was normal because the mother had not then developed sufficient anti-Rh agglutinins to produce haemolysis. Help in determining the genotype of the father may be obtained by testing their child, since, if it is Rh-negative, the father must be heterozygous. If, however, the child is Rh-positive, further help can be obtained by determining the father's Rh subgroup: this St serum agglutinates the red cells of 80% of people, including all negative people and all those (48%) who are heterozygous; therefore the remaining 20% of people whose red cells are not agglutinated must be homozygous (see article by G. L. Taylor and R. R. Race in the *Journal* of Feb. 26, p. 228). Actually, since 38% of people are homozygous this test will discover over half of them, but it can be carried out in only a few laboratories.

Should the parents have another child and it develops haemolytic disease of the newborn, the immediate prognosis would be a good one if the child were given prompt and adequate transfusions with Rh-negative blood, but we do not yet know whether such treatment will prevent the occurrence of kernicterus or cirrhosis of the liver. In previous years, when regard was paid only to ABO grouping, kernicterus occurred in about 8% of cases; but evidence should be forthcoming in 2 or 3 years' time to show whether this incidence is diminished by the use of Rh-negative blood. The possibility that the child may develop kernicterus or cirrhosis must be clearly understood by the parents should they decide to have another child, but the risk that haemolytic disease may manifest itself as hydrops foetalis is so small that it can be disregarded.

#### Oiling Blankets

**Q.**—May I have details of the technique of oiling blankets to prevent the disturbance of fluff, dust, etc., or alternatively a reference where this is given? What I have in view is avoiding such contamination of the air in the operating theatre.

**A.**—Recent work has shown that blankets may be grossly contaminated by droplets expelled by streptococcal and staphylococcal throat and nose carriers, and that, during bed-making or when the bed is merely being tidied, the dried bacteria-containing droplets are raised into the air and may produce infection by inhalation or by falling on susceptible tissues such as open wounds or burns. A contaminated blanket brought into the operating theatre with a patient may therefore be a means of infecting intentional wounds. The fluff of blankets is also the chief contributor to the dust of hospital wards. Van den Ende and his colleagues (*Lancet*, 1941, 1, 716) had found that spindle oil, a crude liquid paraffin, could when rubbed into wooden or lino-covered floors prevent bacteria-infected dust being raised into the air during sweeping. This principle was applied to textiles, at first using purified liquid paraffin in white spirit, and later "technical white oil" with an emulsifying agent which allowed an oil-in-water mixture. Recipes for the preparation of these oil emulsions may be found in the report by van den Ende and Thomas (*Lancet*, 1941, 2, 755); a ready-made oil emulsion, olinol No. 1, is available from the Manchester Oil Refinery Ltd.

In practice 20% of the oil emulsion is added to the last cold-water rinse in the washing machine. The blankets are treated for 20 minutes, when they are transferred to the hydro-extractor, from which the oil-in-water effluent may be salvaged for further use. Though they now contain 3 to 5% of oil, the treated blankets can scarcely be differentiated from unoiled blankets. Besides the physical adsorption of dust particles, the oiled blankets may, depending on the emulsifying agent, be bactericidal as well as bacteria in moist droplets. In any case the oiling of blankets and other textiles will reduce by 99% the number of bacteria liberated during vigorous shaking. Blankets in constant use need to be re-oiled once a month, but not necessarily after sterilization, which, incidentally, should be done at a pressure not exceeding 5 lb. in order to avoid damage to the wool. Further technical improvements will doubtless increase the practicability of using oiled bed-linen for preventing dust-borne infection.

#### Fore and Aft

**Q.**—What are the modern views on the relation (if any exists) between the pelvic viscera or the abdominal contents and the pharynx and its accessory structures? Some thirty years ago, when I was a student, we used to be told about a "prostatic cough," due, I understood, to some kind of influence of an enlarged prostate on the cough mechanism. I have also seen references to a similar cough produced by some uterine conditions, and to "fullness in the head," rushing and roaring noises in the ears, and other slight but not necessarily insignificant symptoms produced by distension of the colon and other forms of constipation. Is all this imaginary or subjective, or has any anatomical connexion, conceivably by way of the circulatory system or the autonomic nervous system, been demonstrated between the pelvic viscera or the abdominal contents and (a) the cough mechanism or (b) the ear and its accessory structures? Or perhaps one might put it: Has any anatomical connexion been demonstrated between the upper and lower ends of the alimentary canal and their accessory structures?

**A.**—No special connexion of the kind is known. Cough is not a common symptom of prostatic disease, and it would suggest that the lesion had led to uraemia. Widespread effects may be produced by distension of the rectum—salivation, nausea and vomiting, mental depression, restlessness, mental haziness, and inability to concentrate. The power of ocular accommodation may be reduced, and measurable changes such as distension of veins and oedema have been described in the retina. These effects show that the rectum is an unusually sensitive organ, and that when it is stimulated a strong stream of impulses flows into the central nervous system and radiates over a considerable area. Sudden death has occurred from distension of the uterus with bland fluid in the attempt to produce abortion. All this indicates that reflex disturbances occur when the pelvic viscera are stimulated, but it does not indicate any special anatomical connexions. An endocrine relationship appears to exist between the nasal mucosa and the sexual organs. Female monkeys show a cyclical activity of the nasal mucosa which is synchronous with the periodic swelling of the sexual skin, and oestrogens have been used in the treatment of atrophic rhinitis. This relationship has some bearing on the phenomenon of vicarious menstruation.

#### Pregnancy and Tuberculous Spine

**Q.**—Is it advisable for a woman aged 32 years, who had tuberculosis of the spine, to marry? And if so, is it advisable for her to have a child? The person concerned was regarded as "cured" about twelve years ago. What is the probability of a recurrence under normal living conditions? Is either of the above factors likely to have any effect in increasing probability?

**A.**—There is undoubtedly a tendency for bone tuberculosis to become active during pregnancy. I know of a case of tuberculosis of the dorsal vertebrae, treated by bone graft some years previously, in which a fatal miliary tuberculosis developed at the end of pregnancy; and I have hearsay knowledge of three other somewhat similar cases. On the other hand, there are many examples of women with old-standing Pott's disease of the spine who have passed uneventfully through pregnancy and the puerperium. Much depends upon the time that has elapsed since there has been clinical or radiological evidence of active disease. To forbid pregnancy in every circumstance will cause needless unhappiness and may lead the patient to feel that her mission in life has remained unfulfilled. On the other hand, to ignore the danger is equally reprehensible. In this case, if twelve years have elapsed since there was evidence of activity (this should include radiological examination), it seems reasonable to allow a pregnancy, other things being equal. The patient must be made to realize the paramount importance of regular adequate rest and of good diet during her pregnancy; milk intake should be specially liberal in order to prevent a possible fall in blood calcium.

The above remarks must be taken only as a general guide. Without full knowledge of the patient, her general condition, her personal circumstances, and so forth, it is not possible to give either a plain "Yes!" or an emphatic "No!"

**Puerperal Fever and Streptococci**

**Q.**—It has usually been supposed that a case of scarlet fever in a household constitutes a danger to a woman who is about to be or has been confined in that household, because of the danger of puerperal fever. Is there any evidence that the causative haemolytic streptococcus in puerperal fever is in fact one of the types causing scarlet fever? It has been suggested that the response to sulphanilamide treatment in puerperal fever and the lack of response to such treatment in scarlet fever indicates a difference in the causative organism.

**A.**—There is no doubt that any haemolytic streptococcus causing scarlet fever or streptococcal tonsillitis is capable, given the opportunity, of producing infection in the genital tract of a parturient woman. The common scarlatinal strains—Griffith's Types 1, 2, 3, and 4—have all been isolated from cases of puerperal infection, and, of course, some of the affected patients develop scarlatinal rashes. Therefore, when a woman acquires a streptococcal puerperal infection, inquiry should be made about any sore throats in the household, and all family contacts as well as the attendant midwife or doctor should have nose and throat swabs examined for haemolytic streptococci.

The failure of scarlet fever to respond to sulphonamide therapy is due to the fact that it is essentially a toxæmia accompanying a local throat infection, whereas puerperal sepsis is an invasive infection of the uterus by the haemolytic streptococcus, and this type of streptococcal infection (compare, for example, erysipelas) is particularly amenable to treatment with sulphanilamide.

**Vaccination and Encephalitis**

**Q.**—Is there any danger in revaccinating young adults? Was there not a scare some years ago when several cases of encephalitis followed revaccination? Is this danger great? How can it be avoided?

**A.**—Encephalitis is a very rare complication of vaccinia. The Committee on Vaccination (1928) reported an incidence in England of 1 : 48,000, and in Glasgow during 1942, when about half a million persons were vaccinated, the incidence was approximately 1 : 70,000. It occurs almost entirely after primary vaccination, although 1 of the 7 Glasgow cases recorded by Anderson and MacKenzie (*Lancet*, 1942, 2, 667) was a woman aged 41 who had been successfully vaccinated in infancy. Children over 5 and young adults are the age groups principally affected. There is no evidence that the encephalitis is associated with any special batch or preparation of lymph. Its greater frequency in England and Holland from 1923 to 1928 suggests that there may be a certain epidemicity in its occurrence. No conclusion has been reached as to whether the encephalitis is caused by the original virus—it follows other virus infections, particularly measles and mumps—or is due to the activation of a latent virus. Symptoms, varying from severe headache and drowsiness to deep coma, usually develop within 7 to 14 days after vaccination, and recovery, when it occurs, seems to be complete without sequels. Convalescent serum or antivaccinal horse serum may be used for the treatment of severe infections. Avoidance of the complication can best be effected by avoiding primary vaccination in school-children and adolescents. If this is impossible, a single linear insertion instead of multiple insertions should be carried out in such cases.

**Atrophic Rhinitis**

**Q.**—A man of about 40 has had atrophic rhinitis for the past 20 years. I would be grateful for suggestions regarding treatment.

**A.**—The most satisfactory local application is glycerin containing 25% of glucose. Benians showed that the organism associated with atrophic rhinitis does not grow in carbohydrate, which encourages the growth of the harmless *Staphylococcus albus*. This answers well when applied in practice, but crusts should be removed.

**Trichomonas vaginalis**

**Q.**—Is infection by *Trichomonas vaginalis* becoming more common? How is it usually acquired? Is it limited to the vagina in females? Are male subjects liable to infection? How is it recognized? What is the best treatment?

**A.**—There is no doubt that infestation by *Trichomonas vaginalis* is either becoming much more common or is being diagnosed more frequently. It seems probable that gynaecologists and venereologists are on the lookout for it much more nowadays than formerly. It is not known how it is acquired, but some regard it as venereal in origin. Apparently it is often present in the normal vagina, but gives rise to symptoms mainly when the pH is about 6 (normal 4-5). It is usually limited to the vagina in females, but may affect other parts of the urogenital tract, especially the urethra. Males are liable to infestation, but the condition is either not common or rarely gives rise to symptoms.

Lister and Lees found *Trichomonas vaginalis* in 4% of 400 consecutive cases (excluding syphilis) attending a V.D. out-patient department and in 16% of 105 cases of diseases of the genito-urinary

system (excluding gonorrhoea). The diagnosis depends on demonstration of the organism. This is done by means of microscopic examination of: (a) moist films, preferably with the dark-ground microscope; (b) cultures; (c) films stained by Leishman's method. The first is probably the most satisfactory method for anyone but an expert.

Treatment consists in producing conditions unsuitable for the growth of the organism. In the male alkalization of the urine by means of sodium bicarbonate by mouth often suffices, but in female various other methods are usually required. These include silver picrate in the form of powder for insufflation and pessaries; tablets of pentavalent arsenic for insertion in the vagina, combined with alkaline douches, or "negatol" in the strength of 2½% for douche and 100% for painting.

**Eczema in a Child**

**Q.**—What treatment can be given either locally or generally to a child of 2½ years suffering from eczema? The lesions are present on the flexor aspect of both legs (in popliteal space), and also on the flexor aspect of elbows and wrists. Lesions are areas of redness and at times covered with scales, at present dry. Various ointments have been tried without any success. The child is well fed, looks well, and has no other defects.

**A.**—The variety of eczema described is met with in children of an allergic disposition. General treatment recognizes their highly strung make-up and aims at a placid environment. Cod-liver oil may be given with advantage, and in many cases residence by the sea, and, in suitable weather, sea bathing, are beneficial. A 6% crude coal-tar paste is usually well tolerated, but should be employed only for a limited time. In view of the nervous make-up, attempts at desensitization are best avoided.

**LETTERS, NOTES, ETC.****Thumb-sucking**

Mr. W. STUART THOMSON, L.D.S., L.R.C.P.Ed. (Edinburgh), writes: With reference to the treatment suggested for the habit of thumb-sucking in your issue of Feb. 19 (p. 277), I should like to criticize very strongly the advice that the child be given a sweet to chew before going to sleep. I quite appreciate that our knowledge of the cause of dental caries is incomplete. Nevertheless, I believe that the large majority of dental surgeons who have studied this subject are agreed that the principal activating cause (or even sole activating cause) of dental caries is the lodgment of fermentable carbohydrate around the teeth. The very worst possible time for carbohydrate to be lodged around the teeth is when the subject is asleep and Nature's cleansing mechanism is at a minimum. Need I say more except to admit that I regret I am unable to offer a suitable substitute for the bedtime sweet?

**Treatment of Sciatica**

Dr. E. BRAUER writes from Spennymoor, Co. Durham: With great interest I have read Sir Arthur Hurst's article on the treatment of sciatica. To the measures enumerated, however, I would like to add one which I have employed with a very high degree of success indeed. It is that of vitamin B<sub>12</sub> injections. I have given vitamin B<sub>12</sub> in all cases of what I diagnosed as neuritis—facial, intercostal, etc.—and, since I regarded sciatica, correctly or not, as neuritis I have used it for this condition as well. I have given it near or far away from the painful region, in the arm or leg, and have nearly always seen good results. Such results, I think, are more than simply due to faith in the treatment; owing to very poor facilities in this area for physical therapy, such as radiant heat, etc. I have not combined this treatment with any of these measures, so that the results cannot be attributed to them. Nor did I make the patient usually rest in bed, except in very severe cases and then only for 2 to 3 days. The results were very rapid, and the patient were fit for work within a fortnight to 4 weeks from the onset of the sciatica. I believe that all cases of what I might call idiopathic sciatica respond to vitamin B<sub>12</sub> therapy; those which showed no improvement at all I regarded as due to causes mentioned by Sir Arthur Hurst, such as prolapse of the nucleus pulposus, etc. I must mention that I find vitamin B<sub>12</sub> in the treatment of neuritis only effective when given parenterally. If given by the mouth the active antineuritic principle seems to be very much diminished or not almost lost in the alimentary canal. To obtain quicker results I have recently used the concentrated ampoules of 25 mg. per c.cm giving 3 to 6 injections daily or on alternate days.

**Infectious Jaundice: A Correction**

Dr. A. M. McFARLAN writes: I find that in your issue of April your report of the discussion on the aetiology of infectious jaundice quotes me as having said: "The laboratory studies included various examinations which excluded the possibility that it was an outbreak of virus disease." This is of course nonsense, and I can only suppose that your reporter misheard what I said about examination excluding Weil's disease and common bacteriological infections of respiratory or alimentary tracts.



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## THE AETIOLOGY OF POST-ARSPHENAMINE JAUNDICE

BY

J. BEATTIE, M.D., D.Sc.  
*Bernhard Baron Professor. R.C.S.*

AND

J. MARSHALL, M.B., M.R.C.S.  
*Major. R.A.M.C.*

(From the Bernhard Baron Research Laboratories, Royal College of Surgeons of England)

Damage to the liver parenchyma, with or without icterus, can occur at any stage of untreated syphilis, acquired or prenatal. Icterus is rare in early acquired syphilis, and when it appears is usually coincident with secondary manifestations, original or relapse. The liver biopsy findings in cases of jaundice in untreated secondary syphilis are indistinguishable from those seen in cases of post-arsphenamine jaundice. Liver material from untreated secondary syphilitics who show no clinical signs of liver damage is quite normal. Jaundice in untreated cases, though of some interest, is of less importance than the icterus which appears after arsenical treatment has been started. This type of jaundice, frequently referred to as "post-arsphenamine jaundice," differs from the jaundice of untreated early syphilis in certain respects. In the latter type the use of arsphenamines in treatment is, in our experience, without danger and leads to a rapid clearing of the icterus. This is not so in the case of post-arsphenamine jaundice. Although many cases have been described in which arsenical treatment has been continued through post-arsphenamine jaundice, we are convinced that such a policy is dangerous. The administration of arsenic before clinical and biochemical recovery in some such cases has produced alarming evidence of increased liver damage. Milian (1934), who believed that the delayed jaundice of arsphenamine treatment is due not to the drug but to a hepatic recurrence of syphilis, continued to treat 75 cases with arsphenamine, and claimed satisfactory results in 66. Of the remainder, 11 were intolerant and 4 died.

Goodman and Gilman (1941) thought that jaundice during arsphenamine treatment "may be due to one or a combination of the following factors—the drug, syphilis itself, or intercurrent infection. The evidence is convincing that many cases represent attacks of non-specific catarrhal jaundice occurring in patients whose livers are subjected to the added insults of syphilis and an arsenical." Mitchell (1943), reporting on jaundice in syphilitics under treatment in the Canadian Army in Great Britain, suggested that jaundice is due to "the association of two hepatotoxic agents—the arsenic and the agent or toxin of infectious hepatitis in patients under arsenotherapy." These two opinions imply that the infectious hepatitis or non-specific catarrhal jaundice (other synonyms—toxic hepatitis, non-spirochaetal epidemic jaundice, simple jaundice, acute catarrhal jaundice) associated with arsenical treatment in syphilitics is identical with that which produces jaundice so frequently in the normal population and which has become so prevalent in recent years.

### Two Types of Hepatitis

It is necessary to emphasize the fact that there are apparently two types of hepatitis occurring during arsenical therapy: (a) an early type which is usually mild and appears within the first two weeks after the first injection of the drug has been given; and (b) a late type which may appear at a variable time after starting treatment, but usually becomes obvious between the 12th and 17th weeks of treatment.

The early type is most commonly seen in intensive arsenotherapy (five-day or twenty-day), but it can occur during the standard treatment course of weekly or bi-weekly injections of an arsenical. The manifestations vary from an increase of urobilinogen excretion to a slight degree of actual icterus of conjunctivae or skin, but are always short-lived. It has been suggested that the cause of this condition may be a direct arsenical damage of the capillaries somewhat analogous to that found in haemorrhagic encephalitis following intensive arsenical treatment. The late type usually appears, as has been stated above, between 12 and 17 weeks after the initiation of arsenical treatment, whether by the intensive or the standard methods.

The pathological pictures and laboratory findings in these two types are different. In the early type there is an increase in the total blood cholesterol, cholesterol esters, and blood phosphates, with "bile thrombi" and cholangiolitis in liver biopsy specimens (Gutman and Hanger, 1941; Naunyn, 1919). The late type shows a marked alteration in the liver cells, ranging from swelling to necrosis with varying degrees of fibrosis (Dible and McMichael, 1943; Dible, McMichael, and Sherlock, 1943). The serum bilirubin values are higher than normal, and may be as high as 49.5 mg. per 100 ml. (in a non-fatal case in our series).

The type with which we are here concerned is the late or delayed type of jaundice which occurs in patients suffering from early syphilis who are being treated with neoarsphenamine by the routine British Army method. This anti-syphilitic treatment consists of weekly injections of 0.6 g. of neoarsphenamine for ten weeks, followed by an interval of four weeks, when a similar second course is given. Third and fourth courses of treatment are given, but a four-weeks rest is interposed between each two treatment courses.

### Syphilis and Arsenicals as Causal Factors

The three factors which Goodman and Gilman (1941) suggest as being responsible, either singly or in combination, for post-arsphenamine jaundice are syphilis, the arsenicals, and an attack of non-specific catarrhal jaundice. There is no pathological evidence to support Milian's view that the delayed jaundice of the type under consideration is due to syphilis of the liver (Dible and McMichael, 1943). The organic arsenicals used in the treatment of syphilis are, however, hepatotoxic. They can produce liver damage in experimental animals, and are almost certainly responsible for the early type of jaundice occurring in intensive arsenical treatment (Lloyd Jones and Maitland, 1943). If they were solely responsible for post-arsphenamine jaundice it might be expected that the incidence of jaundice would remain fairly uniform from year to year. Before the war and up to the spring of 1941 the experience of one of us (J. M.) in clinic practice showed that the incidence of jaundice was about 2 per 100 new cases of early syphilis under treatment. Although there was no change in the scheme of treatment, dosage, type, and manufacturers of the drug, the

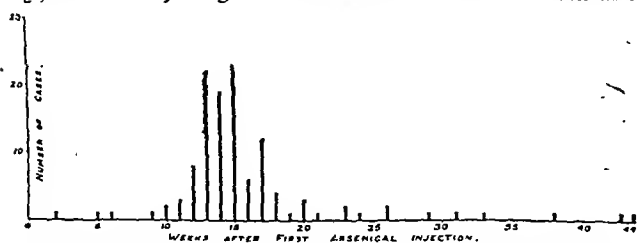
incidence rose steadily during 1941 and 1942, until in one clinic (M.I.H.) 46% of treated cases developed jaundice.

The possibility that owing to wartime conditions there might have been some alteration in the toxicity of the drug used was considered. This hypothesis was discarded early when it was discovered that other clinics whose jaundice incidence was lower were using the same drugs and in some cases the same batches of drugs from the same manufacturer. Drugs from different manufacturers and different batches of the same drug were tried in this clinic, but the incidence was not significantly affected whatever drug or batch was used. As Curtis (1942) had observed that an increase in the amount of drug used (from 7.5 to 13 g. in thirteen weeks) increased the jaundice incidence from 7-8% to 25-30%, it was thought that a reduction in the dose of arsenical from 5.85 g. to 4.05 g. over a period of ten weeks might show a significant decrease in incidence. In certain clinics where the reduced dosage was used no such decrease was observed during an adequate period of observation. When arsenoxide was given by bi-weekly injection instead of neoarsphenamine once weekly there was again no significant drop in incidence, although the total amount of arsenic was very much reduced.

The above evidence suggested that although syphilis and the arsenicals can produce liver damage they cannot be responsible alone for the increase in jaundice observed in our clinic (M.I.H.). Ruge (1927) made the observation that in the German Navy the incidence of jaundice in syphilitics bore a definite relation to the incidence of infective (non-spirochaetal) jaundice in the general population. When the incidence rose in the non-syphilitics a parallel rise occurred in the syphilitics. Stokes, Ruedemann, and Lemon (1920) noted a similar phenomenon. The present rapid rise in the incidence of jaundice among syphilitics in this country has been observed over a period when infective hepatitis was becoming increasingly common in the general population. There would thus appear to be good reason for considering the third possibility of Goodman and Gilman's—namely, an infective factor.

#### The Role of Infection

The complete records of 119 male cases of early syphilis who had received all their antisyphilitic treatment at one clinic (M.I.H.) were available. The time interval between the attendance at the clinic when the first arsenical injection was given and the time of onset of jaundice was determined for each patient. A graph showing the number of cases of jaundice in each week following the first injection was prepared (see Fig.). The array ranged from the 11th to the 44th week after



Graph showing number of M.I.H. cases of post-arsphenamine jaundice occurring in each week of antisyphilitic treatment. (Total cases, 119.)

the first arsenical injection. The median lay in the 15th week. Of the 119 cases, 90 (76%) occurred during the 12th to 17th weeks (inclusive).

If it be assumed that some infective factor was transmitted from patient to patient, the latent or incubation period of most of the cases would appear to be between 12 and 17 weeks. The wide limits of the incubation period and the presence of 20 cases occurring after longer periods might be explained by assuming that infection did not take place until some injection later than the first. Some of the remaining 9 cases which occurred before the 12th week may not be late or post-arsphenamine jaundice, but may be examples of the early type discussed above.

It seemed unlikely that the disease was spread by contact, as is infective hepatitis, but that the spread occurred through inoculation of an infective agent when arsenical injections were being given. Bigger (1943) has pointed out that imperfect

sterilization might be responsible for leaving in the syringe infective material which could then be passed into the next person injected by the same syringe and needle. The incubation period in our cases of post-arsphenamine jaundice was probably between 80 and 100 days, which was about three times as long as that determined by Pickles (1939), Edward (1943), and Ford (1943) for infective hepatitis in non-syphilitic in which there was no possibility of transmission by inoculation.

The length of the incubation period and the possibility that an infective agent had been transmitted by inoculation suggests that post-arsphenamine jaundice might be identical with the jaundice which occurs after the administration of human blood products or of yellow fever vaccine containing human serum (Findlay *et al.*, 1937, 1938, 1939; MacNalty, 1938; Proper, 1938; Soper and Smith, 1938; Beeson, 1943; Memorandum by Medical Officers of the Ministry of Health, 1943; Morgan and Williamson, 1943; Steiner, 1944). Although the possible incubation periods recorded by these various observers are not identical the median for each series of observations falls within or slightly before the period in which the greater number of our cases of post-arsphenamine jaundice occurred (76% of cases between the 12th and 17th weeks). While this evidence is highly suggestive it is not sufficient to prove the complete identity of post-arsphenamine jaundice with the types following the use of human blood products. It does, however, appear to separate all these types of jaundice from the epidemic form of infective hepatitis such as described by Pickles.

An attempt has been made to obtain some precise information on the method of transmission of the disease. It was suggested by MacCallum early in 1943 that if transmission of the infective factor in post-arsphenamine jaundice was due to inoculation of infective material contained in imperfectly sterilized syringes, then if each patient were given a syringe at the beginning of his treatment and received injections only by that syringe after proper sterilization the transmission of infection ought to be eliminated. It was decided to treat 10 early syphilitic cases and to give each patient a new and unused syringe for his exclusive use for all his injections. (The syringes for this experiment were provided by Dr. MacCallum.) Such syringe and needles were washed and boiled both before and after each injection. Because of postings to units away from the Command only four of the ten were observed beyond 120 days after the first treatment. No case of jaundice appeared in this group in spite of the fact that the patients were in contact for about the first 14 days of treatment, and subsequently at least once each week, with men who later developed post-arsphenamine jaundice. One of the four men under observation proceeded on leave and received two arsenical injections at another clinic from syringes used to inject other patients. The syringes were not boiled after being used for previous patients, but had been rinsed with sterile water followed by 70% alcohol, and were given a further rinse in distilled water. This man developed jaundice later. The relevant data are given below:

Patient S			
Date of first injection	at "S" clinic	May 26, 1941	
" " second " "	" " "	Sept. 2	
" " first symptom of liver damage	" " "	Nov. 8	
" " icterus	" " "	Nov. 27	
Interval between first injection at "S" clinic and first symptom of jaundice	" " "	83 days	

This series, though short when taken in conjunction with Bigger's experiments, is strongly suggestive of blood transmission. The single case of jaundice after a probable accident infection might establish the latent or incubation period for post-arsphenamine jaundice as being about 12 weeks. It suggested, too, that patients transferred from V.D. clinics, where the incidence of jaundice was low, to M.I.H. clinic, where the incidence was high, might, if they developed jaundice, show some evidence that their infection took place at the latter clinic. Eight men were traced who had such histories. Details are given in Table I.

All these cases have time intervals between the first injection at M.I.H. clinic and the onset of jaundice which fall within the range of 12 to 15 weeks—precisely the range within which the greater number of cases of jaundice appeared in the large series of 119 patients. If it be assumed that the exact incubation period is 12 weeks from inoculation of the infective material (as occurred in the single case described above), then only

TABLE I

Case	Date 1st As Inj.	Date 1st As Inj. at M.I.H.	Date Appearance of Icterus	Days from 1st Inj. to Icterus	Days from 1st Inj. at M.I.H. to Icterus
Fr. G	26/ 3/42	13/ 8/42	1/12/42	250	110
M	17/ 4/42	22/ 8/42	9/12/42	236	109
N	2/ 8/42	16/10/42	30/ 1/43	181	106
L	12/ 1/42	18/11/42	21/ 2/43	405	101
S	29/ 9/42	20/11/42	17/ 3/43	141	89
F	7/ 8/42	3/ 1/43	20/ 4/43	256	107
D	27/11/42	25/ 2/43	4/ 6/43	190	99
	17/10/42	26/ 2/43	7/ 6/43	233	101

portion of the patients are infected at the first injection, but the chances of becoming infected are greater with each successive injection. This would explain the shift in the median to the 15th week in the long series, the large number of cases occurring up to the 17th week after the first injection, and the sporadic cases up to the 44th week.

### "X" and "Y" Diseases

The disease described by Pickles, Edwards, and Ford had an incubation period of about 28 to 30 days and was transmitted by contact with a person who was infective. In post-arsphenamine jaundice and in homologous-serum jaundice the incubation period is about three times as long and transmission is by inoculation of the infective material. These considerations suggested the possibility that there were two diseases—an "X" disease, i.e., infective hepatitis—and a "Y" disease, including post-arsphenamine jaundice and jaundice following the injection of human blood products as described above. Clinically and biochemically it has not been found possible to differentiate these diseases. When biopsy specimens from the liver are taken the pathological appearances have been shown to be common to each type of disease (Dible, McMichael, and Sherlock, 1943).

Assuming that two diseases do exist and that the infective factors are different, immunity conferred by one disease might not protect against the other. Pickles, in a private communication, is of the opinion that the immunity conferred by an attack of jaundice (infective hepatitis) is "as complete as that conferred by an attack of measles." His records contain only one instance of a possible reinfection. It would appear that there is but a remote chance of a reinfection with X disease. In our series of 105 cases of X disease no instance of a reinfection could be traced. There were no clinical relapses in this series. By analogy it might be expected that an attack of Y disease would confer similar immunity.

At one hospital (M.I.H.) 280 cases of jaundice were treated in the jaundice ward and one as an out-patient. All were syphilitics. Of this group seven developed a second attack of jaundice. The relevant data are given in Table II.

TABLE II

Case	1st Inj. As	1st Symptom of Jaundice	Interval between 1st Inj. and 1st Symptom (days)	2nd Attack of Jaundice began	Interval between Attacks (days)	Interval between Discharge from Hospital and Date of 2nd Attack (days)
H	9/12/41	26/ 1/42	48	29/ 6/42	154	137
M	9/ 7/42	9/11/42	123	1/ 3/43	112	98
B	14/ 8/42	22/ 2/43	192	29/ 7/43	157	119
L	29/10/42	8/ 3/43	130	5/ 5/43	58	50
C	12/12/42	21/ 3/43	99	22/ 5/43	62	33
E	13/ 5/43	10/10/43	150	3/11/43	24	7
Fs.	8/ 6/43	11/ 9/43	95	11/10/43	30	11

Patients E and Fs. were most probably examples of true relapse caused by untimely celebration of their discharge from hospital. There was no evidence that, either immediately before or during their stay in hospital, they had been in contact with a case of infective hepatitis or a person who subsequently developed the disease. Patients C and L had been seen at weekly intervals between their discharge from hospital and their second attack of jaundice. They were apparently quite fit during the interval and were on full duty. Arsenical injections had not been resumed. There was thus a possibility that their second attack was due to an infection with X disease after their discharge

from hospital. Contact with known cases could not be proved. Cases H and M could not have been reinfections with Y disease as they had received no injections of any kind at the hospital or elsewhere until four weeks before their second attack, when arsenical treatment was resumed. Toxic hepatitis due to the arsenical itself was ruled out as there was no supporting evidence to justify this possibility. There remained a possible infection with X disease, but again an attempt to trace contacts failed. Patient B's case was exactly similar to those of Patients H and M except that he resumed arsenical treatment only two weeks before the second attack. If the two patients who had a simple relapse be omitted there are left five possible examples of infection with X disease out of a total of 281 cases. This gives a possible "infection" rate at this hospital (M.I.H.) of 1.8%.

At another hospital, B, the patients under treatment in the jaundice ward included some who had X disease (infective hepatitis) and others with Y disease (post-arsphenamine jaundice). At no time did the ward contain only one of the two diseases. During a period of six months 80 cases of Y disease and 40 of X disease were treated. While there were no relapses or reinfections in any of the cases of X disease five so-called relapses occurred in Y-disease patients. An analysis of the time of appearance of the relapses showed that they fell within a period lying between the 30th day after admission to hospital and the 30th day after discharge. As it was possible in this group to be certain of full clinical and biochemical recovery, and as all had shown no abnormal response to test doses of neoarsphenamine, the presumption is that these cases were true infections with X disease and that such infections were contracted while in the ward. The "infection" rate was therefore 6.3% as compared with 1.8% in the other hospital (M.I.H.).

In Hospital B the cases of X disease occurred exclusively in U.S. Army personnel, while the Y cases occurred almost exclusively to British Army personnel. An analysis of the U.S. Army cases showed that all had received yellow fever inoculations at least eight months before they developed jaundice in England. Of the 40 cases 5 had developed jaundice within four months after their yellow fever inoculations and while still in the U.S. If it be assumed that post-vaccinal yellow fever jaundice is Y disease, then this disease did not confer immunity against an attack of X disease. That the second attack was X disease was proved by evidence of contact with cases of X disease 28 to 30 days before the second attack began.

The evidence so far is suggestive that an attack of Y disease does not immunize against X disease. It might be expected that an attack of X disease does not immunize against Y disease. Of the 360 cases of Y disease in both hospitals evidence of an attack of jaundice preceding the syphilitic infection was obtained in only 6 cases. The time interval between the attack of presumably X disease and the attack of Y disease varied between 10 years and 18 months. The evidence to support a diagnosis of X disease was not good, as it was impossible to secure a history of contact with other cases of jaundice, except in two of the six cases.

The recent large-scale epidemics of post-vaccinal yellow fever jaundice and of infective hepatitis ought to provide in the near future more convincing evidence than has been produced here on whether or not there are two diseases each of which provides no immunity against the other.

### Summary of Present Evidence

The evidence at present available may be summarized as follows:

X disease, or infective hepatitis, has an incubation period of about 28 to 30 days and is transmitted by contact. It can exist in a form in which icterus never appears but which is apparently sufficient to confer immunity against reinfection.

Y disease, whether late post-arsphenamine jaundice or homologous-serum jaundice, has an incubation period of 80 to 100 days and is transmitted by inoculation of infective material (blood, serum, or plasma).

An attack of Y disease presumably confers no immunity against X disease.

Evidence that an attack of X disease confers no immunity against Y disease is scanty and incomplete, but is suggestive.

Relapses of Y disease have been explained mostly on the grounds of an infection with X disease.

psychologies of the academic type and noticing how their authors ignore or merely hint at the existence of such stupendous and fundamental biological phenomena as those of hunger, sex, and fear, I should not disagree with, let us say, an imaginary critic recently arrived from Mars, who should express the opinion that many of these works read as if they had been composed by beings that had been born and bred in a belfry, castrated in early infancy, and fed continually for fifty years through a tube with a stream of liquid nutriment of constant chemical composition. To put it drastically, most of our traditional psychologists are about as useful for purposes of understanding the human mind as an equal number of dissertations on Greek statuary would be to a student eager for a knowledge of anatomy. Such a student at once learns that the object of his investigation, the human animal body, is very largely composed of parts offensive to the aesthetic sense, but this does not deter him from studying them as thoroughly as other parts. The typical psychologist, who might be expected to study his material in the same scientific spirit, does nothing of the kind, but confines his attention to the head and the upper extremities and drapes or ignores the other parts.

"Now I believe that the psycho-analysts are getting down to brass tacks. They have discovered that the psychologist's game, which seems to consist in sitting down together or with the philosophers and seeing who can hallucinate fastest or most subtly and clothe the results in the best English, is not helping us very much in solving the terribly insistent problems of life. They have had the courage to dig up the subconscious, the hotbed of all the egotism, greed, lust, pugnacity, cowardice, sloth, hate, and envy which every single one of us carries about as his inheritance from the animal world. These are all ethically and aesthetically very unpleasant phenomena, but they are just as real and fundamental as our entrails, blood, and reproductive organs. In this matter, I am glad to admit, the theologians, with their doctrine of total depravity, seem to me to be nearer the truth than the psychologists. I should say, however, that our depravity is only about 85 to 90%.

"In nothing is the courage of the psycho-analysts better seen than in their use of the biogenetic law. They certainly employ that great biological slogan of the nineteenth century with a fearlessness that makes the timid twentieth-century biologist gasp. But, making all due allowance for the extravagant statements of Freud and Jung and their disciples, any fair-minded student of human nature is compelled to admit that there is a very considerable residuum of accurate observation and inference in their accounts of the dream, of the perversions of the nutritive and sexual instincts, of the erotic conflicts and repressions, and of the surviving infantilisms. . . .

"To me one of the most striking indications that the psycho-analysts are on the right road is the fact that many of their theories have such a broad biological basis that they can be applied, *exceptis excipiendis*, to a group of animals so remote from man as the insects. This has not escaped Jung, who calls attention to the striking analogies between the nutritive caterpillar stage and human infancy, the chrysalis and the period of latency, and the imaginal butterfly and puberty in man. There are even cases of repression and sublimation as in the workers of social insects, and did time permit I could cite examples of multiple personality or of infantilisms—that is, larval traits which survive or reappear in the adults of many species. Insects undoubtedly sleep. Do they dream? If they do, what a pity that we shall never be able to apply the Freudian analysis to the dream of that symbol of sexual repression and sublimation, the worker ant!

"But these are trivial considerations. The great fact remains that the work of the psychiatrists is beginning to have its effect even on such hidebound institutions as ethics, religion, education, and jurisprudence, and that the knowledge that is being gained of the workings of our subconscious must eventually profoundly affect animal no less than human psychology, since the subconscious is the animal mind."

#### Psychology

Now let us turn to one other field close to that of psychiatry where differences from psychiatry may serve for the purpose of definition. As physiology is to the practice of medicine, psychology is—or should be—to the practice of psychiatry. In the history of medicine the investigation of the normal did not precede the study of the abnormal. The abnormal has revealed the normal as the exception illustrates the rule. Similarly, psychology as the study of the normal function of the organism has received much from psychiatry. Indeed, the whole method of experimentation in so far as it creates artificial conditions produces in some degree illuminating abnormalities. As a source of knowledge the abnormal precedes the normal.

There are psychiatrists who would be content to describe psychiatry as medical psychology, just as there are physicians who insist that medicine is physiology applied to disease. Though in theory psychology should play this role and thus

be the handmaiden to psychiatry, she is in reality a very green-haired girl with almost as much to unlearn as to acquire before she becomes indispensable to the psychiatrist. Patience rather than dismissal is indicated; for even now psychology, especially when well grounded in biology and physiology, is valuable. Already psychology gives real though limited service in mental testing, conditioned reflex research, localization studies, and in certain selective procedures like the Rorschach test.

#### A Summary

To summarize the foregoing: Human beings are not merely collections or assemblies of collaborating organs. They have functions and capacities characteristic of organisms as a whole and appropriate for individuals living in indispensable contact and collaboration with other human beings. What they do we call conduct or behaviour (and equally important, what they manage to keep from doing). Psychiatry is the field of study which concerns a very wide range of disorders, defects, or inadequacies of behaviour of these individuals. It has been wisely said that life's aim is an act, not a thought. In the same sense it is not merely mental phenomena that constitute the material of psychiatry, but that blend of instincts, emotions, thoughts, and feelings and physiological states which eventuates in conduct—in action or the inhibition of action. It is true that conduct will be affected by physical, chemical, or other disturbances in some part of the machinery of the body—e.g., bullet wounds, metabolic disorder, alcohol, bacterial disease. But it is also true that we witness disturbances for which we can find as yet no cause so simple and objective, where mood and motivation, emotions and instincts, and the faculties of adjustment to reality appear to be in conflict or disorder; and these derangements also are the task of the psychiatrist.

#### The Status of Psychiatry

Now for a few comments upon the status of psychiatry and I am done. Since 1880 medicine as a whole has profited immeasurably from two broad lines of study—bacteriology and cellular pathology. The one explained a host of diseases as due to invading micro-organisms, the other described in analytical terms of separate organs and organic disease the phenomena shown by sick people. There has been for the past fifty years, however, something approaching neglect of the patient as a person. Let me quote from a first-rate physician—Louis Hamman of Baltimore.

"To the specialist, psychiatry is another specialty operating in a contiguous but separate domain. To the internist, it is a vital and integral part of his work. Indeed, I find it impossible to formulate a clear expression of the relation of psychiatry to medicine, so intimately and inextricably are they bound together. The physician studies and practises psychiatry continuously, even when he protests that he has not the least knowledge of formal psychiatry. It is the chief instrument of his success, even though he may practise it unconsciously. . . .

"In spite of this growing importance it is the subject about which medical students know least and the one in which their training is most deficient. The reasons for this slighting treatment of psychiatry are many; I can mention only a few of the outstanding ones.

"1. The General Lack of Appreciation of the Importance of the Subject.—When I was a medical student psychoneurotics were objects of ridicule and contumely, not of serious study and sympathy. The patient with no gross lesion to justify his many complaints was neglected and avoided. The worst insult that could be cast at a fellow-student was to call him neurasthenic. After careful observation had established the fact that a patient had no organic disease professional relations were supposed to be at an end and he was dismissed with some reassuring remark as, 'There is nothing whatsoever wrong with you; your troubles are imaginary; go and forget them,' or even more curtly with a placebo and the ardent hope that he would never return. With the passage of years this brusque attitude has become somewhat softened, and yet essentially it is still the attitude of many physicians. The mind always seeks precise classification and is never more pleased than when experience can be snugly labelled. . . .

"In order to furnish tangible evidence of the important part psychiatric problems play in the practice of medicine I have reviewed the records of 500 consecutive patients who consulted me. To give the figures any value I must explain that my practice covers the whole field of internal medicine and that patients come to me or are sent to me chiefly for diagnosis. I have no reputation as a psychiatrist nor am I even suspected of having unusual interest or

talent in that field. Not one of the 500 patients consulted me on account of an overt psychiatric condition. . . .

"Among the 500 patients there were 116 (23%) without any discoverable organic cause for the symptoms of which they complained. In addition, there were 56 (11%) presenting minor organic lesions but with symptoms which could not possibly be explained by the lesions alone. In a word, one-third of the patients suffered solely or predominantly from functional disorders."

Strictly speaking, it might be stretching a point to say that all of these functional disturbances were due primarily to psychiatric disorders. Nevertheless, if you are willing to define the province of psychiatry as the broad field I have outlined, then surely the problems of these patients are of interest and concern to psychiatrists. For instance, a man otherwise well and competent suffers from very distressing digestive symptoms whenever he is worried, or for other reasons under nervous strain. Shall we consider this a psychiatric problem? I think we undoubtedly must, since here psychic influences play the chief role in disturbing the balance of the vegetative nervous system. What is commonly called the spastic colon invades the psychiatric field more prominently than it does the gastro-enterological.

With steady insistence psychiatrists have laid stress upon the whole personality of any and every patient—their own and those in every medical specialty. Psychiatrists, despite their isolation in asylums, despite inferior recruitment to their ranks and the taboo and horror associated with insanity, despite the time required for making their diagnoses, and despite their isolation from experimental methods and the fact that laboratory animals do not appear to develop psychiatric conditions (except Pavlov's experimental neurosis)—despite all these handicaps psychiatrists are nearer to adequate discharge of their duties than they have ever been before. For the first time man studies his own conduct dispassionately and in terms of cause and effect—not devils and disasters. Cannon's work upon the physiology of the emotions, the exceptional growth of neurophysiology, thanks to Sherrington and to new instruments of registering the changes of electrical potential in nerves, the stimulus of Freudian theory, of Pavlov's work on reflex behaviour, and the steady extension of scientific methods of study of psychiatric patients, are some of the factors in the progress of psychiatry.

Much remains to be done. Kolb of the United States Public Health Service reported that in 1939 \$200,000,000 was spent on mental diseases, yet not 1% of it for research. One child in every 20 in the United States will at some time of his life be in hospital for mental disease, and another child in the same 20 will at some time be psychiatrically disabled but not hospitalized. There are probably 6,000,000 feeble-minded persons of all grades in the United States, 80 to 95% at large in the population, 100,000 alcoholics and drug addicts, between 800,000 and a million mentally diseased, and 400,000 epileptics. There are more hospital beds devoted to psychiatric cases than to all other forms of disease. Ninety per cent. of the cost is at public expense. And in the face of the dislocation, loss, and sorrow in the families of the mentally disordered the statistician remains mute.

We are indebted to the Editor of the *Menninger Clinic Bulletin* for permission to republish this article.

Mr. Sydney Lamb was appointed secretary and organizer of the Liverpool Hospitals Council—now the Merseyside Hospitals Council (Inc.)—early in 1927, having already achieved notable success in Sheffield, where as secretary of the Hospitals Joint Council he increased the annual contributions from employees and employers by over £100,000 in five years. From this post of general secretary of the Merseyside Hospitals Council Mr. Lamb is about to retire. Starting in Liverpool with a rather small office, he worked indefatigably to make the "Id. in the E" principle an integral part of everyday life on Merseyside. To-day he controls a large organization which enables workers and employers to make their own contribution towards a complete hospital service—one of the most comprehensive in Britain. It assumes responsibility for the hospital service of a million Merseyside workers and their dependants, and has an annual income of £420,000. Among the many important posts held by Mr. Sydney Lamb was the office of general secretary and treasurer of the International Hospital Association, which took him to many of the great capitals and cities of both Europe and America. In 1941 he became honorary secretary of the British Hospitals Contributory Schemes Association.

## OCULAR SYNDROME IN ONCHOCERCIASIS

BY

J. GRAHAM SCOTT, M.D., D.O.M.S., B.Sc.

Major, R.A.M.C.

*Onchocerca volvulus* (the blinding filaria) is commonly found in certain parts of West Africa and America. It produces keratitis and iritis. Strong, Sandground, Bequaert, and Ochoa (1934) found microfilariae in affected eyes. Hisette (1932, 1938) described choroidoretinitis, retrobulbar neuritis, and optic atrophy in cases of onchocerciasis. Luna (1918, 1919) had previously described keratitis punctata onchocercosa due to filarial toxins.

It is proposed to describe cases in which (1) oedema of the upper lid, (2) proptosis, (3) ciliary flush, and (4) oedema of the optic nerve occurred as unilateral phenomena in two patients with onchocerciasis, and to suggest that a lymphatic block directly due to microfilariae or indirectly due to filarial toxins (as in Calabar swelling) is an explanation of the four symptoms.

### Case I

This case is that of a Gambian soldier, and is believed to be the first case of onchocerciasis described in a Gambian, it being uncommon among them. He was admitted to hospital on Dec. 31, 1942, complaining of a painful watering right eye. He had previously enjoyed good health and had experienced no trouble with his eyes until the day before admission. When admitted vision was 6/5 R., and 6/5 L. The right eye was watering and had a slight ciliary flush. The media were clear and the fundi normal. The case was diagnosed as early uveitis and treated with atropine 1% and hot-spooning 4-hourly. The next day the upper lid of the right eye was swollen and there was slight but definite proptosis.

Examination of the general and central nervous systems presented no abnormality on this or on any subsequent occasion, other than the eye signs to be described. The cerebrospinal fluid and white cells were normal. Radiographs of sella, sinuses, and orbits were normal. Blood films, day and night, revealed no microfilariae. A triple-centrifuged specimen of blood revealed a few *A. perstans*, a very common microfilariasis in West Africa. A snip of conjunctiva showed no microfilariae. The Kahn precipitation test was positive (+). (This is a common finding in a yaws-infected population.) Blood pressure was 100/70. The urine had no albumin or sugar.

In five days the proptosis became less, but the right fundus showed blurring of the disk. Next day vision was 6/36 R., 6/6 L. The lower half of the right disk was covered with exudate. The oedema of the upper lid and the proptosis gradually faded during the next 14 days, but the right fundus slowly developed a low-grade oedema, with swelling of the nerve head of 1 or 2 dioptres. The upper temporal veins became veiled with exudate, and a few flame-shaped haemorrhages developed round the disk at 10 and 7 o'clock. The macula remained within normal limits till the thirteenth day, when it slowly developed a complete star reflex. Fields were as follows. Right: depressed, with enlarged blind spot but no central or other scotomata; 1/1000 white gave 5 degrees field; 5/1000 gave 25 degrees field. Left: normal. Colour test (pseudochromatic): two mistakes right eye; normal left eye.

19th Day.—Temporal veins less veiled and oedema of nerve head subsiding. Vision: 6/24 R., 6/6 L.

33rd Day.—Right fundus returning to normal. Fan reflex at macula persists. Vision: 6/18 R., 6/6 L. Fields show no central scotoma for 1/1000 white or 5/1000 colour. Patient has been having 1% atropine and heat t.i.d. to the right eye and pot. iod. gr. 5 t.i.d. by mouth. After a provocative injection of 0.45 g. N.A.B. the Kahn reaction was "doubtful positive," and a course of 10 weekly injections of 0.60 g. N.A.B. was given.

60th Day.—Vision: 6/5 R., 6/5 L. The left fundus had been normal throughout, and the right fundus showed slight cuffing of vessels on leaving the disk and a faint fan-shaped reflex at the macula. The haemorrhages had been absorbed, and only a slight fullness of the upper lid remained. On the 75th day a slit-lamp became available. One microfilaria was seen in the right and left anterior chambers. There was no K.P., and the right cornea presented a few nebulae in the substance of the cornea. Blood films showed no microfilariae by day or by night.

90th Day.—One or two microfilariae have been seen in both eyes on most days since first noted. The course of N.A.B. is now finished. Vision: 6/5 R., 6/5 L. The right fundus is within normal limits. Patient discharged.



It was possible later to withdraw a microfilaria from the anterior chamber; this was found on staining to be *Onchocerca volvulus*. A skin snip showed many microfilariae (*O. volvulus*), although no nodules could be felt. The right eye showed one fresh yellow speckled opacity in the cornea, which I have seen only in cases of onchocerciasis.

The patient was seen again in 5 and 7 months. He was well and had no trouble with vision or with pain in the eyes despite the presence of microfilariae in each anterior chamber. The fundi were normal, except the faintest veiling of the margins of the right disk.

### Case II

The second case was admitted on July 3, 1943, with a painful swelling in the right axilla, mild oedema of the right upper eyelid, and ciliary flush. The axilla was incised and cleared in a normal fashion. The right eye, however, soon became closed with oedema of the upper lid, and proptosis developed. Both fundi remained normal, but vision dropped line by line over a period of 10 days from 6/9 on admission to 1/60. The right eye was painful with lachrimation. Radiographs of the orbits were normal. The Kahn reaction was negative. Central nervous and other systems were normal. The patient was unable to co-operate in perimetry. Day and night films showed scanty microfilariae (*A. perstans*), but a skin snip had many *O. volvulus*, and typical nodules were felt over the right and left iliac crests. No microfilariae were seen in either anterior chamber, but fine dots of pigment were observed on the posterior corneal surfaces.

On the 17th day vision was 6/12 R., 6/5 L.; oedema of the lid was lessening and proptosis and ciliary flush had cleared. On the 27th day vision was 6/5 R., 6/5 L. Slight fullness of the right upper lid remained. The right fundus was normal throughout, except for a transitory haziness on the 7th day, so the neuritis in this case was retrobulbar.

### Discussion

The syndrome presented by these two soldiers is not a familiar one in general ophthalmic practice. In the cases described the diagnosis must rest on probabilities, since no single finding was sufficient to establish the diagnosis beyond doubt. The presence of oedema of the upper lid, proptosis, ciliary flush, and optic neuritis indicates a lesion behind the eyeball. The probable causes are (a) haemorrhage, (b) tumour, (c) infection, (d) congestion.

(a) Haemorrhage can be excluded by the absence of subconjunctival ecchymosis.

(b) Tumour is improbable in view of the complete recovery, and lack of other signs pointing to neoplasm or cyst.

(c) Infection (i.e., an orbital cellulitis or a cavernous sinus thrombosis) is not supported by the findings. The absence of a history of previous sinus trouble, the healthy appearance of the orbit on x-ray examination, and the normal white cell count are against orbital cellulitis. The absence of a primary lesion on the face or in the mouth is against cavernous sinus thrombosis. A syphilitic optic neuritis is not commonly unilateral, and in the absence of choroidal changes and unequal pupils this diagnosis is improbable, especially in view of the negative Kahn in the second case. The group of demyelinating diseases has to be considered. Disseminated sclerosis is the commonest cause of a unilateral retrobulbar neuritis, but does not produce proptosis. Furthermore, this disease is very uncommon on the West Coast. Dr. H. Thomas has neither seen or heard of a case in 16 years' medical service on the coast, and Dr. Carmichael Wilson has seen only one case in Nigeria 18 years' service. Neuromyelitis optica and Schilder's disease are ruled out by the subsequent history of the cases.

(d) Congestion can be venous or lymphatic. Venous congestion is ruled out by the absence of early fullness of the retinal veins. The association of lymphatic swelling and filariasis is well recognized in elephantiasis, although the mechanism is not quite clear. The filariae in most cases are *Wuchereria bancrofti*, but Strong reports cases due to onchocerciasis. Calabar swelling, an anaphylactic oedema, is associated with *Loa loa*, so there is a precedent for suggesting that onchocerciasis can produce lymphatic swelling. A direct block of the retrobulbar lymphatics by a host of microfilariae is possible, but since microfilariae are well tolerated as a rule by the tissues this is not considered likely. More probable is the theory that an anaphylactic oedema can be produced in the orbit as a result of *O. volvulus* toxins, and that such an oedema is the explanation of the syndrome of oedema of the optic nerve and of the upper lid, with proptosis and ciliary flush.

### Summary

Two cases with proptosis, oedema of the lid, ciliary flush, and oedema of the optic nerve associated with onchocerciasis are described. One is believed to be the first case of onchocerciasis reported in a Gambian. It is suggested that the cause of the syndrome is an anaphylactic oedema caused by *Onchocerca volvulus*.

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### BIBLIOGRAPHY

- Duke-Elder, Sir S. (1940). *Textbook of Ophthalmology*, 3, 3437.  
 Hisette, J. (1932). *Ann. Soc. belge Méd. trop.*, 12, 433.  
 — (1938). *Amer. J. trop. Med.*, 18, Supp., 58.  
 Luna, R. P. (1918). *Amer. J. Ophthalm.*, 3 s., 1, 122.  
 — (1919). *Ibid.*, 3 s., 2, 793.  
 Stilt, E. R. (1941). *Tropical Medicine*, vol. 2.  
 Strong, R. P., Sandground, J. H., Bequaert, J. C., and Ochoa, M. M. (1934). *Onchocerciasis, with Special Reference to the Central American Form of the Disease*, Cambridge, Mass.

## THE NERVOUS COMPLICATIONS OF INFECTIVE HEPATITIS

BY

F. GRAHAM LESCHER, M.C., M.D., M.R.C.P.

Physician to the Derbyshire Royal Infirmary, and to the General Infirmary, Burton-on-Trent

The nervous complications which may arise during the course of infective hepatitis are by no means common. They occur occasionally in spirochaetosis icterohaemorrhagica, but they seem to be even rarer, judging from the literature, in the epidemic form of infective hepatitis.

### Nervous Complications of Weil's Disease

Apart from such conditions as mild headache, restlessness, delirium, convulsions, and coma, which are due more likely to the general infection than to any actual involvement of the nervous system, the nervous complication most often met with in Weil's disease is that of meningitis. Yet, judging from reports of cases in the literature, this is of comparatively infrequent occurrence, despite the writings of some French physicians. Meningitis occurred, for instance, in only 3 of the 40 cases of this disease reported by Davidson and Smith (1936).

Meningitis may occur in Weil's disease with or following the jaundice. It may even be the prominent feature in this infection, the jaundice and haemorrhages being slight or even absent—"spirochètose méningée anictérique" of Costa and Troisier (1916, 1917). The cerebrospinal fluid is under pressure, and it may be clear or opalescent, with a fibrinous clot which forms on standing. There is a pleocytosis, with a predominance of the polymorphonuclear variety in the graver cases, lymphocytes in the less severe. Spirochaetes may be found in the fluid, and if the latter is injected into suitable animals jaundice and haemorrhages will generally occur. Eleven cases of meningitis of leptospiral origin, proved by the inoculation into guinea-pigs of the patient's blood or cerebrospinal fluid, have been reported by Costa and Troisier. Cochez and Fichet (1933) have published an account of three similar cases with, however, no obvious signs of jaundice. Inoculation of the urine, blood, and cerebrospinal fluid into guinea-pigs caused jaundice and haemorrhagic lesions in the liver and lungs, and spirochaetes were found in the livers. Agglutination reactions against *L. icterohaemorrhagiae* were positive in the sera of all three patients. These authors emphasize the following additional clinical signs as particularly characteristic of this disease: mild meningeal signs, labial or palpebral herpes, and conjunctival infection. Troisier and Boquien (1933) have examined a number of case histories of patients suffering from meningitis of leptospiral origin, accompanied with, or without, jaundice. Schöffner and Walch-Sorgdrager (1940) had, up to 1936, collected 25 case reports of meningitis from among 312 Dutch patients suffering from Weil's disease. According to their experience, meningitis is commoner in this infection without jaundice; so it seems advisable that serological tests should be carried out in all cases of non-pyogenic meningitis in which the aetiology is obscure. According to the reports of most

authors, nervous symptoms tend to appear during the acute phase of the disease, although Davidson and Smith (1936) and Jurgatroyd (1937) have each reported a case of Weil's disease in which meningitis occurred at least four months after the jaundice.

Recently I have seen a patient with Weil's disease in whom the illness started with violent headache and vomiting. Two days later jaundice appeared. On admission to hospital there was slight stiffness in the muscles of the neck. The cerebrospinal fluid was under increased pressure and was pale yellow in colour. It contained 5% neutrophils and 25% lymphocytes, and 80 mg. of protein per 100 c.c.m. The gold curve was normal. No spirochaetes were found in the fluid. There was marked hepatic and renal impairment. Nevertheless this patient made a good recovery, both clinically and biochemically.

Whereas in Weil's disease meningitis may not be quite so uncommon as is generally supposed, yet the involvement of the nervous parenchyma itself is decidedly rare. Mortensen (1940) was able to find only four cases in the literature in addition to one of his own. Two of these patients suffered from peripheral neuritis in the lower limbs, the others with myelitis. His own case was one of jaundice which at first was thought to be due to Weil's disease; but the serological reactions were abnormal, so that it was more likely to be due to an infection with a leptospira of a different type. Three weeks after the beginning of the illness signs of meningitis appeared, together with a transitory flaccid paralysis of the lower extremities. The patient made a good recovery. The same author has found in the literature the reports of a few cases of Weil's disease with paralysis of the third, sixth, and seventh cranial nerves.

### Nervous Complications in Epidemic Hepatitis

Nervous complications seem to be uncommon in epidemic hepatitis, although perhaps if a special watch were kept their occurrence might be found to be more frequent than the literature would suggest. As in leptospiral infections, the least uncommon of these nervous complications is meningitis.

Fliessinger (1924) has reported the case of a young man who developed meningitis. Less than a week after the onset jaundice appeared. He was thought to be suffering from Weil's disease, but spirochaetes were never found in the blood, nor in the urine or cerebrospinal fluid; and although inoculation of some of the patient's blood into a guinea-pig caused the death of the animal, jaundice did not occur, nor were haemorrhages or spirochaetes found in the internal organs. The patient's serum did not agglutinate leptospirae. Among the 300 cases of epidemic hepatitis of which an account was published by Ford (1943) there was only one that showed signs of meningitis. Waring (1943) has reported a case of his type of hepatitis in which meningitis started five days after the onset of jaundice. The cerebrospinal fluid was opalescent and under increased pressure. There were 544 cells per c.m.m., chiefly lymphocytes, together with an increased amount of globulin. This patient made a good recovery.

Lemierre, Lhermitte, and Bernard (1929) have related an interesting case of a young man who complained of acute abdominal pain and vomiting for which no cause was found on laparotomy. Shortly afterwards acute painful flaccid paralysis developed in the lower limbs, to be followed in a short time by a similar condition in the upper limbs. The right trigeminal and facial nerves then became affected, together with loosening and falling out of the teeth. Meanwhile, jaundice developed, which progressed until death occurred from asphyxiation due to paralysis of the muscles of respiration. At necropsy areas of degeneration were found in the trigeminal, vagal, and hypoglossal nuclei; also in the anterior horn cells of the spinal cord. But although the liver was enlarged, no appreciable changes were found. Lemierre has reported a case of a patient who developed spastic paraplegia during an attack of epidemic jaundice.

Lelong and Bernard (1935) have had under their care during a local epidemic a girl of 14 suffering from infective jaundice. Four weeks after the beginning of her illness polyneuritis developed in the upper and lower limbs, starting distally and spreading upwards. Serological tests to leptospirae were negative; nor was the organism found in any of the body fluids. Complete recovery eventually took place. Newman (1942), describing an outbreak of infective hepatitis, noted the occurrence of mild meningitis and neuritic signs in some patients; while Brain (1943) has reported the occurrence of convulsions, hemiplegia, and mild polynuritic signs which preceded the onset of epidemic jaundice. Out of 170 patients suffering from epidemic infective hepatitis studied by Cameron (1943) in Palestine, only five showed nervous complications. Two developed mental disturbance, which was attributed to hepatic insufficiency. In the other three patients temporary ocular difficulty with accommodation occurred. All made a good recovery. No case of meningitis was seen by that author.

Judging from the various accounts of cases published in the literature and from one's own experience, the prognosis of nervous complications in infective hepatitis seems to be good.

### Two Cases of Epidemic Hepatitis with Parenchymatous Disease of the Nervous System

**Case 1.**—A housewife aged 28 was admitted to the Derbyshire Royal Infirmary on Jan. 28, 1943, complaining of weakness of the arms and legs, together with jaundice. At the time there was an epidemic of jaundice in the town. She had not come into contact with chemicals nor did she use hair-dye or cosmetics. She was accustomed to an ordinary mixed diet and showed no signs of dietetic insufficiency. On the night of Jan. 7 she went to bed with a cold and headache. The next day she complained of numbness and weakness in the fingers, then in the hands and forearms, and shortly afterwards in the feet and legs. A week later jaundice was noticed. The urine was dark in colour; there was no diarrhoea, and no alteration of colour in the stools.

On examination she was a well-nourished woman; cerebraation was good, there was no anaemia, and jaundice was pronounced, being more so on the face, chest, and abdomen than on the lower limbs. The lower edge of the liver was felt three fingerbreadths below the costal margin. The spleen and lymphatic glands were not enlarged. There was a marked symmetrical weakness and wasting of the muscles of the hands, forearms, and to a lesser extent of the arms and shoulder-girdles, together with loss of reflexes. A similar condition, though less pronounced, was present in the lower limbs. A slight degree of objective sensory loss was found over the hands and feet. The functions of the bladder and rectum remained unaffected. Nothing abnormal was found in the other systems. On most evenings for the first three weeks after admission her temperature was raised to between 99 and 101° F. The urine contained bile pigment but no bile salts. About the seventh week a small amount of albumin was present for a short time. The cerebrospinal fluid was examined two days after admission. It was yellow in colour, but showed nothing else abnormal. The blood contained 4 mg. of bilirubin per 100 c.c.m. The serum gave negative agglutination tests to *L. icterohaemorrhagiae*. The leucocyte count was never over 9,000 per c.m.m. The jaundice cleared up within about six weeks of admission, and a month later the polyneuritis had improved sufficiently for her to leave hospital, and to attend for treatment as an out-patient. Subsequently she made a complete recovery.

**Case 2.**—An R.A.S.C. driver aged 24 was admitted to hospital in Persia during Feb., 1943, suffering from epidemic hepatitis. He was told me that this condition was common in that country. He was discharged to duty eight weeks later. On April 28 he suddenly felt giddy and sick and complained of headache. On readmission to hospital the next day he was feverish and drowsy. A few days later, on waking up, he was unable to move his left upper limb, and his left leg was weak. On examination he was found to have a left hemiplegia of the upper neurone type, together with a left homonymous hemianopia. Nothing abnormal was observed on examination of the rest of his nervous system, nor in his cardiovascular or any other system, with the exception that his blood pressure was only 100/55. Two weeks later the cerebrospinal fluid pressure was normal, although the pressure was not given. The Wassermann reaction in the blood and cerebrospinal fluid was negative. The white cell count in the former was 10,500 per c.m.m. Nothing abnormal was ever discovered in the urine. He was invalided home and admitted to the Derbyshire Royal Infirmary last September. He still showed signs of a left hemiplegia with left homonymous hemianopia, although both are now improving.

### Discussion

From the paucity of the sporadic reports of nervous complications occurring during infective hepatitis, it can be argued that there may be a possibility of coincidence and that two separate diseases may coexist. On the whole, however, the probability is that the hepatitis and the complications in the nervous system are but two phases of the same disease. It is, of course, well known that certain pathogenic viruses, such as that of poliomyelitis, have a selective action on the nervous tissue. Other viruses, such as those causing measles, chicken-pox, mumps, atypical pneumonia, etc., may under certain circumstances infect the nervous system. Now, although definite proof that epidemic hepatitis is caused by a virus infection is still lacking, yet during the last few years evidence that it is so caused has been accumulating. Thus, if this assumption be correct, it is not unreasonable to suppose, or even to expect, that nervous complications could occur in some of those who suffer from epidemic jaundice. Another possibility is that lowered resistance of the liver in infective hepatitis may predispose to infection by the same or a different virus in other parts of the body. During the past

year, for instance, I have seen herpes develop in several patients who were suffering from infective hepatitis.

Judging by the analogy of the affinity of the *Spirochaeta pallida* for nervous tissue even in the early stage of syphilis, it is not unreasonable to assume that the nervous system may also be affected by other spirochaetes, such as *L. icterohaemorrhagiae*, during the course of its invasion.

If the association of nervous complications with infective hepatitis is kept in mind, it may be found that this combination, especially in cases in which the jaundice is not obvious, is not so uncommon as is at present supposed. Therefore, all cases of so-called "aseptic meningitis" of doubtful aetiology, or polyneuritis without obvious cause, should be carefully scrutinized for the presence of latent jaundice. The association of jaundice with nervous complications may possibly be further exemplified by such a condition as progressive lenticular degeneration (Wilson's disease), in which cirrhosis of the liver and a varying degree of jaundice occur together with involvement of certain parts of the brain, especially the corpus striatum.

### Summary and Conclusions

The occurrence of nervous complications in Weil's disease and in epidemic hepatitis has been discussed.

Meningitis is the nervous complication most commonly met with in both diseases.

Disease of the nervous parenchyma, though it does occur, is rare in both infections.

Meningitis occurring in a patient suffering from Weil's disease has been described; also two cases of epidemic hepatitis, in one of which polyneuritis developed. In the other, hemiplegia, presumably due to an encephalitis, occurred within a few weeks of the attack of epidemic hepatitis.

While the possibility of coincidence has been kept in mind, the probability is that the hepatitis and the nervous complications are but two phases of the same disease.

This combination may be found to be not quite so uncommon as was formerly supposed, especially if the presence of latent jaundice is looked for in all cases of infective nervous disease of doubtful aetiology.

### REFERENCES

- Brain, R. (1943). *Proc. roy. Soc. Med.*, 36, 320.  
Cameron, J. D. S. (1943). *Quart. J. Med. (N.S.)*, 12, 139.  
Cochez, P., and Fichet, F. (1933). *Presse méd.*, 41, 646.  
Costa, S., and Troisier, J. (1916). *Bull. Mém. Soc. méd. Hôp. Paris*, 40, 1802.  
— (1917). *Presse méd.*, 25, 189.  
Davidson, L. S. P., and Smith, J. (1936). *Quart. J. Med. (N.S.)*, 5, 263.  
Fiessinger, N. (1924). *J. Practiciens*, 38, 773.  
Ford, J. C. (1943). *Lancet*, 1, 676.  
Lelong, M., and Bernard, J. (1935). *Bull. Mém. Soc. méd. Hôp. Paris*, 51, 1749.  
Lemierre, A., Lhermitte, J., and Bernard, E. (1929). *Ibid.*, 45, 457.  
Mortensen, V. (1940). *Lancet*, 1, 117.  
Murgatroyd, F. (1937). *British Medical Journal*, 1, 7.  
Newman, J. L. (1942). *Ibid.*, 1, 61.  
Schüller, W. A. P., and Walch-Sorgdrager, B. (1940). Quoted by Mortensen, loc. cit.  
Troisier, J., and Boquien, Y. (1933). *La Spirochétose Méningée*, Paris.  
Waring, J. (1943). *British Medical Journal*, 2, 228.

## SURGICAL PROBLEMS IN FORWARD AREAS

BY

GUY BLACKBURN, M.Chir., F.R.C.S.

Major, R.A.M.C.; Surgeon to a Field Surgical Unit

The scope of surgery in forward areas has advanced in recent years to more than life-saving measures and heroic ablations, often in vain. In their place there is, it is true, major surgery with a high proportion of amputations; but resuscitation, chemotherapy, and new views on after-treatment have altered the principles and results out of all recognition. Difficulties, of course, remain that experience alone can solve, and when not to operate and when not to evacuate are among the most striking. Evacuation, indeed, controls the whole problem; and familiarity with the mode of transport and distances involved should be an essential part of a forward surgeon's information. Many a successful technical procedure has been ruined by premature evacuation, many a wounded man set back further by a long ambulance ride than improved by the resuscitation not long preceding it. Cases of burns and thoracic and abdominal injuries illustrate this point well.

The surgeon in forward areas has admittedly the easiest task in one respect, for the field is new ground, surgically

speaking, and the line of approach determined by the wound agent. The position of the wounded man at the time of injury and the type of missile may, however, modify this appreciably. Buttock wounds, in particular, demonstrate this fact, no more than 10 to 15% involving the peritoneal cavity. With regard to the type of missile, coincident blast is a complicating factor, too easily forgotten, as that of the lower lobes of the lung in wounds of the upper abdomen. Gross external with less internal damage by mortar wounds is less likely to mislead than the converse with shell or rifle wounds. In all types, however, the through-and-through wound may well be the problem. This, *par excellence*, is the wound to be left alone, especially when of the "gutter" type in subcutaneous tissues. Wounds of the right upper quadrant of the abdomen, involving the liver only, may also fall into the same category.

### The Abdomen

Abdominal wounds, in general, are still prognostically the worst, an all-in mortality of 50% being my experience. That of numerous surgical colleagues in the North African campaign: This is high, perhaps too high; but many of the factors determining it are beyond the surgeon's control. The interval between receipt of injury and operation is still the most important, and it is reasonable to suggest that every hour after six is more serious than two before it. Civilian figures for mortality of operations for perforated peptic ulcer provide a close parallel. (In the abdominal injuries dealt with by me in forward areas 10 to 12 hours was the average time between wounding and operation.)

Once the patient reaches the operating centre, however, many problems arise—perhaps more in the five or six days after operation than at the operation itself. Given blood instead of plasma, which is no substitute in cases with mesenteric bleeding, the decision and moment to operate are not, as a rule, difficult to determine. The approach then is in the line of the entry wound, and a buttock wound, for example, should be explored first before proceeding to deal with the intraperitoneal damage complicating it. At times, as a result, laparotomy will be found unnecessary; for abdominal rigidity with these, as with thoracic wounds, may easily be found misleading.

The importance of searching the alimentary canal from stomach to rectum has been stressed by numerous observers, and a patient too ill to stand this is too ill for operation. The exceptions are few enough to ignore. With this proviso, the plan should then be clear, and the task usually involved is exteriorization of the large gut and suture or resection of the small. The higher the lesion, of course, the better the prognosis. Even then, however, coincident injuries to other parts of the body may turn the scale, as it has been the exception rather than the rule to have to deal with a single wound. Too often, in fact, the wounded man provides an operation list in himself.

This raises the interesting subject of abdomino-thoracic wounds, which account for 20% of all wounds of the abdomen. These are more serious on the left than on the right side, but experience has shown that they are not necessarily grave than simple wounds of the abdomen. The abdominal injury in these cases is likely to be high and the bowel may be intact, the liver or spleen being the only viscus damaged. Simultaneous renal injury may occur—one notable case in the series under discussion necessitating nephrectomy, splenectomy, and closure of a large pleural defect, without untoward result. A successful cholecystectomy and duodenal repair has also been done for a right-sided abdomino-thoracic injury.

Post-operative continuous gastric suction and measures designed to prevent ileus repay all the care they demand; but a proportion of disappointing results remain which, at times, seem hard to explain. Why, for example, should pulmonary oedema have proved fatal in gunshot wounds of the spleen where no more than three pints of blood or plasma had been given in the 24 hours after operation? Why too, unless hypovitaminosis is the explanation in an army in the field, should a plastic peritonitis be the cause of death three weeks or more after operation? A typical example occurred in a man requiring resection of four feet of ileum and a colostomy for visceral injuries from a machine-gun, seen within five hours

Evacuation to a general hospital was delayed for more than fortnight, and the patient died nearly three weeks after this. The holding of patients for at least ten days after laparotomy made a vast difference to results, and by this time the issue was usually clear. Even then, however, evacuation by air or slow stages is the method of choice.

#### Chest Wounds

These are not, as a rule, difficult to deal with in forward areas, the minimum possible being done after closure of open wounds of the pleura. In a series of more than 60 cases only one required operation for bleeding from an intercostal vessel reducing a haemothorax. Repeated aspiration in this instance aided to prevent displacement of the apex beat to the fifth right interspace three inches from the midline. Surgical emphysema likewise has necessitated intervention only once in the same series.

#### Limb Injuries

Sixty to eighty per cent. of all wounds involve the limbs, and the lower more often than the upper. Immobilization of a standard type simplifies the problem in these cases. Illustrative and valuable examples are the Tobruk plaster for fractures of the femur and thoraco-brachial plaster for the humerus. Plaster cuffs for amputation stumps have also proved useful. Coincident injuries, such as a Pott's fracture with a fractured femur, can complicate the picture appreciably.

Of all fractures perhaps those of the upper third of the femur must be regarded as the most dangerous, associated in dispatch riders, who are the commonest victims, with head injuries which may also be grave. The value of radiographs in these as in all fractures in forward areas has too often been exaggerated, as immobilization and not realignment is the surgeon's task. Excision of the wound is of course required, and difficulty is often experienced in distinguishing bone fragments from foreign bodies. The errors, however, can easily be rectified when definitive treatment is carried out after evacuation.

Amputations, as already stated, are numerous, and primary suture is no more admissible here than in any other site. Blood transfusion in these cases is usually vital, and for double amputations imperative. One such case did well although operated on 15 hours after injury with massive destruction of one leg below the knee and gas gangrene in the other.

Gas gangrene has been encountered more than a dozen times in 500 cases, and the interval since wounding has twice been less than eight hours. One case oddly enough presented coincident maggot infestation, and the wound was (as usual in these cases) very clean. Excision of the affected muscle group proved effective. The diagnosis in the majority of cases, however, is made not from an inspection of the wound but from the patient's general appearance—the sallow, vivid look, incipient delirium, and restlessness being characteristic features. The presence of gas in the wound is unusual and has been noted only once. Anaerobic gangrene, in fact, might be a more descriptive and apposite term. It may even be fair to say that the presence of gas in gas gangrene, so-called, is as useful in establishing the diagnosis as skeletal secondaries in carcinoma of the breast.

Chemotherapy in these infections is an adjunct to and not a substitute for radical surgery. Buttock, thigh (lateral aspect), and calf wounds, for anatomical reasons, are those most apt to develop gas gangrene, and prophylactic serum for all of them may well have reduced the incidence of this complication. There again postponement of evacuation for some while after operation is of the greatest value. In these cases, as in large wounds with gross sepsis, secondary haemorrhage is the real danger of the convalescent period. When it occurs nothing but ligation of the main vessel involved is likely to be effective.

#### Burns

Routine treatment with sulphanilamide and petroleum jelly gauze after gentle but thorough cleansing with saline is still the method of choice, and it is the anaesthetist rather than the surgeon whose task is difficult. General agreement will probably be expressed with the danger of peptothal in extensive burns as in head injuries. Intravenous morphine has, in fact, proved much more satisfactory, and can be used with advantage for subsequent dressings at five-day intervals.

#### Conclusions

Evacuation controls the problems of surgery in forward areas. The number rather than the nature of wounds may be the most important prognostic feature.

The all-in mortality of abdominal wounds is 50% or thereabouts.

Abdomino-thoracic wounds are not necessarily more serious than abdominal.

No patient should be evacuated until ten days after a laparotomy.

Radiographs of fractures in forward areas are unnecessary in nearly all cases.

"Anaerobic gangrene" is suggested as an alternative to "gas gangrene." The presence of gas is a late manifestation.

Intravenous morphine is the anaesthetic of choice in the treatment of burns.

## Medical Memoranda

### Severe Granulocytopenia from Sulphaguanidine

A recent M.R.C. Memorandum (1943a) reports that sulphaguanidine has shown little toxicity to date, although nausea, drug-rash, and fever have occasionally been noted. The occurrence of severe granulocytopenia in a young adolescent treated for Sonne dysentery with moderate doses of this drug is therefore of some importance.

#### CASE RECORD

A girl aged 15 who had complained of headache, vomiting, and diarrhoea since the previous day was admitted to an E.M.S. hospital with a pyrexia of 101.2° and tenderness over the course of the colon. Her general condition was good and the frequent watery stools contained no blood or noticeable excess of mucus. Desoxy-epitope cultures produced a heavy growth of *B. dysenteriae* Sonne.

Sulphaguanidine was begun on the third day of the illness, 1.5 g. being given three times daily in the first three days. By this time the temperature had become normal and the stool cultures negative, and the dose was reduced to 1 g. three times daily, which was continued for four days. Thus a total of 25.5 g. of sulphaguanidine was given in seven days.

Six days after the drug had been discontinued the stools became relaxed and the cultures again became positive. A second course of sulphaguanidine was begun eight days after the conclusion of the first, 1.5 g. being given four times daily. After only two doses the temperature, previously normal, rose to 100.2° and there was complaint of a feeling of lassitude and slight headache. The temperature showed morning remissions to normal, but the malaise persisted, and on the third day, when a total of 15 g. had been given, the second course of sulphaguanidine was stopped. On this day the total leucocyte count was 5,500 per c.mm., of which 64% were polymorphs. The following day the temperature showed no morning remission and the leucocytes had fallen to 4,100 per c.mm., of which 38% were polymorphs. A day later the pyrexia reached 103.2° and the leucocyte count was 2,000 per c.mm., of which only 10% were granulocytes.

Sodium pentnucleotide was given in 10-cm. doses three times daily for four days, and twenty-four hours after starting it the leucocyte count had improved to 4,000 per c.mm. Of these 38% were of the granulocyte series, 4% being myeloblasts, 16% myelocytes, and 18% polymorphs. Thereafter there was gradual improvement, but six days elapsed before primitive white cells ceased to be present in fair numbers and before the temperature became normal. The red cells were not affected. There were no necrotic lesions and no petechiae.

#### COMMENT

Sulphaguanidine is used in the treatment of bacillary dysentery because of the local bacteriostatic action of the proportion of the total dose given which reaches the colon unabsorbed and is finally excreted in the faeces. Attention has centred on this action, and it requires to be emphasized that approximately two-thirds of the amount administered by mouth is absorbed before the ileo-caecal valve is reached (M.R.C. Memo., 1943b). That relatively low blood concentrations occur with this sulphonamide is due in far greater measure to rapid elimination in the urine than to poor absorption from the intestine (Fior and Poth, 1941). The possibility of agranulocytosis resulting from the administration of sulphaguanidine therefore merits attention, especially as the drug is often given to large groups of cases in epidemics, when regular checking of the granulocyte count may be impracticable.

That agranulocytosis is liable to occur during second courses of treatment has frequently been observed with other sulphonamides. In the above case the early onset of headache, lassitude, and slight pyrexia after the resumption of sulphaguanidine is suggestive of sensitization by the first course of the drug.

I wish to thank Dr. W. A. Bullough, County Medical Officer of Health, for permission to publish this report.

A. GRANT, M.D.

#### REFERENCES

- Irwin, W. M., and Poth, E. J. (1941). *Ann. Surg.*, 114, 663.  
I.R.C. War Memo. No. 10 (1943a). *The Medical Use of Sulphonamides*, p. 39.  
— (1943b). *Ibid.*, p. 9.

### Megalocytic Anaemia in a Young Vegetarian

Trowell (*Lancet*, 1943, 1, 43) of the Uganda Medical School reviewed the subject and literature of deficiency anaemias of malnutrition, with special reference to macrocytic anaemia. The present case is of interest in showing, although far from fully investigated, certain unusual features in a type of anaemia apparently uncommon in this country.

#### CLINICAL HISTORY

On Aug. 5, 1941, a lorry-driver, a single man aged 20, was referred to the department by Dr. J. Strachan of Leyland, for a blood count. In April, 1941, three of his teeth had been extracted because of soreness of the tongue and mouth. In May, tiredness, breathlessness, and loss of colour were first noticed; and these, the only symptoms, steadily increased. For 15 years he had been practically a vegetarian. For breakfast he had bread-and-butter with either salad of lettuce and tomato, or jam; treacle, or marmalade; and for lunch bread-and-butter, potatoes in gravy with peas or carrots, rice pudding; meat was taken at most as scraps in a weekly olla podrida. His tea was similar to the breakfast, with home-made cakes, biscuits, or fruit pies; and his supper consisted of bread-and-butter. The patient had never been fond of cheese, bacon, meat, eggs, or liver, and only took milk in tea, coffee, or cocoa at each meal. His parents, sister, and two brothers were all well and were not vegetarians; there was no family history of anaemia.

**Examination.**—Well-built and well nourished; marked pallor of mucosae; tachycardia; spleen impalpable, reflexes normal; tongue slightly smooth at the edges; onychia not marked. Blood: Hb, 35% (Haldane); red cells, 1,400,000 per c.mm.; C.I., 1.25; reticulocytes, 1.5%; mean diameter of red cells, 8.2  $\mu$  (diffraction method); mean corpuscular volume, 114 cu.  $\mu$ . White cells, 10,600 per c.mm.; differential count, normal. Red cells showed variability of size, shape, and staining; but no nucleated or stippled forms were seen. Plasma bilirubin, 0.85 mg. per 100 c.cm.; urea, 35 mg. per 100 c.cm.; W.R., negative. The urine showed no excess of urobilin.

The uncommon diet was viewed with suspicion, but the patient was unwilling to come into hospital, and was treated in bed at home as a case of presumptive pernicious anaemia. Between Aug. 6 and 29 he received injections of anahaemin in doses of 6 c.cm., 4 c.cm., and 8 of 2 c.cm. (total, 26 c.cm.).

**Progress.**—On Sept. 2, 1941, a gruel test meal revealed histamine-fast achlorhydria. The blood count showed: Hb, 85%; red cells, 4,400,000; C.I., 0.9; mean cell diameter, 7.5  $\mu$ . From that date until July 4, 1942, the patient received an injection of 2 c.cm. of anahaemin fortnightly. Counts done in Dec., 1941, and in Feb., April, and June, 1942, showed haemoglobin never less than 95% and not fewer than 5,000,000 red cells per c.mm., with a mean diameter of not more than 6.9  $\mu$ . Since Aug., 1941, a normal amount of meat, bacon, and milk had been taken in the diet. In July, 1942, it was decided to stop the injections and watch for a relapse. On five occasions between Aug. 4, 1942, and Jan. 18, 1943, haemoglobin was not less than 100%, nor the red cells below 5 millions. On Jan. 22, 1943, a test meal of 50 c.cm. of 7% alcohol showed a spontaneous secretion of free hydrochloric acid (from 8 to 12 c.cm. N/10 NaOH per 100 c.cm. of juice in the first three samples, rising after subcutaneous injection of 1 mg. of histamine to from 50 to 60 c.cm.), and the diagnosis of pernicious anaemia was abandoned. Fragility of the red cells was found to be normal at this time. Regret that marrow films were not examined before and after starting liver treatment, and a more delicate therapeutic experiment planned, is tempered by the patient's pleasure at his quick return to full fitness, and the prospect of relief from lifelong treatment. On Nov. 2 the patient felt and looked very well. His haemoglobin and red cell diameter were normal; and his reticulocytes numbered less than 1%.

#### COMMENTS

Points of note are: (1) The patient's good state of nourishment, indicative of the selective "anaemia-producing" action of his defective diet. (2) The early histamine-fast achlorhydria, but with a normal test meal 5 months later: Trowell found free HCl "almost always present." (3) The rapid improvement of the anaemia following anahaemin in moderately large though not massive dosage.

I wish to thank Drs. Strachan and F. B. Smith for their co-operation and for permission to publish.

R. T. COOKE, M.D.Ed.

Assistant Pathologist,  
Preston Royal Infirmary.

## Reviews

### DISEASES OF THE BONES

*Medical Clinics on Bone Diseases. A Text and Atlas.* By I. Snapper, M.D. (Pp. 225; illustrated. £3 7s. 6d.) London: H. K. Lewis and Co 1943.

Twenty years ago editors of Systems of Medicine were apologetic in approaching a contributor to write the section on diseases of the bones, for they seemed such a disconnected collection of conditions. Now the position has changed completely. Recklinghausen's disease has been proved to be of endocrine origin, and this has reacted on our interpretation of bone lesions in long-standing renal insufficiency. Osteomalacia and rickets have vindicated their status as deficiency diseases. The relationship of leukaemia, multiple myelomata, and hyperthyroidism to the skeleton has proved to be closer than was supposed. Lipoid granulomatosis affecting the bones has been recognized as the cause of new syndromes. X rays and biochemistry have greatly helped in formulating these new points of view, as to a lesser extent has the technique of sternal puncture. All this has put the earlier observations of Paget, Bence-Jones, Davies-Colley, and von Recklinghausen into their proper perspective as part of a growing synthesis. To that synthesis the present volume makes a sympathetic contribution, with admirable clinical descriptions and discussions, a bibliography, and striking illustrations.

We have come to realize that, whereas a parathyroid adenoma may be the cause of a profound disturbance of skeletal structure, it is also true that hyperplasia of the parathyroids may be a secondary and compensatory effect, as maintained by Erdheim, in various diseases. Thus, in osteomalacia they enlarge to deal with the excess of calcium and phosphorus set free by the destruction of bone, while chronic renal failure, if accompanied by acidosis, as it often is, stimulates enlargement of these glands. This interrelationship between the kidney and the parathyroids is further exemplified by the renal calculi composed of calcium salt which so often form in hyperparathyroidism. Indeed, latent hyperparathyroidism has been held to be responsible for between 0.5 and 2% of all renal calculi. The enlargement which may follow a complete biliary fistula is presumably to compensate for the consequent ill-absorption of the fat-soluble vitamin D. Fortunately the tendency to remove the parathyroids for the relief of osteo-arthritis or otosclerosis has passed.

Full justice is done to the pioneer work of J. P. Maxwells in China on the essential unity of osteomalacia and ante-natal and post-natal rickets. The way in which the social custom of that country lead to severe foetal and benign infantile rickets and to the prevalence of osteomalacia—a rare disease in Europe—is discussed in an interesting manner. Complicated syndromes may also arise by the superposition of avitaminosis on pre-existing bony disease. It has been recognized that in Paget's disease there is a notable increase in phosphatase although the metabolism of calcium and phosphorus is normal and the explanation seems to be that this augmentation occurs under any condition in which there is hyperfunction of osteoblasts. It is indeed a non-specific sign. The treatment of Paget's disease by carefully controlled injections of parathormone, followed by ultra-violet rays, seems to hold prospects in a hitherto incurable disease. Leontiasis ossea regarded as a syndrome of the same order.

Lipoid granuloma may form islands of foam cells laden with cholesterol esters in fibrous tissue, but when it attacks bone it has a predilection for the skull and pituitary for which the syndrome of Hand-Schüller-Christian disease resurges. In Gaucher's disease a special lipoid—kerasin—is abundant in the bone marrow, so that sternal puncture has become an important diagnostic technique in its recognition. The concluding chapter on multiple myeloma indicates that some connexion exists between it and myeloid leukaemia, and that



paration which has been made between different diseases the blood-forming organs has been too rigid.

The whole work is a fascinating and important study, which would be difficult to praise too highly, for it is a model of its kind which reflects great credit on all concerned in the production.

## AN ENCYCLOPAEDIA OF HISTOLOGICAL METHODS

*Microscopic Technique in Biology and Medicine.* By E. V. Cowdry, Professor of Anatomy, Washington University, St. Louis. (Pp. 206. 54.00 or 22s.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1943.

His new work by E. V. Cowdry is entitled *Microscopic technique in Biology and Medicine*. Except in so far as it deals with the electron microscope, fluorescence microscopy, and other methods of observation or illumination, the book does not, as its title might suggest, concern itself so much with examining material microscopically as with preparing it or examination. It is in fact a very valuable encyclopaedia of histological methods, listing alphabetically stains and other reagents and materials with the appropriate methods for them, each being described succinctly, often with references to original papers for further information. It deals with rather more than histology in the ordinary sense, since a good deal of space is devoted to the direct observation of living tissue, and instructions are also given for demonstrating bacteria, protozoa, fungi, and certain animal parasites not only in tissues but in body fluids. Its scope on the histological side is wide, including several columns on the microscopical location of vitamins, and several pages on the use of radio-active isotopes as tracer substances. Not only methods but a good deal of underlying theory come in for consideration: the qualities of things are explained, and purely technical items are interspersed with sections on such theoretical matters as oxidation-reduction potential. Introductory chapters deal with the choice of methods in a wider sense, with laboratory organization and the standardization of stains.

This should be a very valuable bench book to several kinds of worker: for anyone with a true pride in beautiful microscopical preparations it offers many possibilities which he will be anxious to explore.

## MAXILLO-FACIAL INJURIES

*Supplement to the Dental Treatment of Maxillo-Facial Injuries.* By W. Kelsey Fry, M.R.C.S., L.D.S.; P. Rae Shepherd, L.D.S.; Alan C. McLeod, D.D.S., L.D.S.; and Gilbert J. Parfitt, M.R.C.S., L.D.S. With Section on Fractures of the Middle Third of the Face by A. H. McIndoe, M.S., F.R.C.S., F.A.C.S. (Pp. 494; Illustrated. 21s.) London: Blackwell Scientific Publications Ltd. 1943.

A review of the parent book to this volume appeared in the *Journal* on June 19, 1943. The supplement contains the case histories and many photographs and radiographs of the most instructive of the cases that have been under the care of the team of dental surgeons at the clinic at East Grinstead. These two books present the most comprehensive treatise on the subject of any published work since the war, and praise must be given to the authors not only for their painstaking conduct and treatment of the cases they have looked after but also for the general conclusions and principles of the treatment which they have been able to lay down for the guidance of dental surgeons who are also undertaking this work.

The authors cover a wide field. To the dental surgeon who has not had the opportunity of treating cases arising from the war, but who occasionally sees civilian fractures of the mandible, the most useful contribution is the insistence on the separate cap splint method whenever there is any displacement, and the cases described show the great advantage of this over the more universal method of using the prearranged cap splint. The difficulties of the edentulous posterior fragment are well reviewed, though the methods employed are complicated and require the facilities of a specialized hospital. Mr. McIndoe contributes a section on the fractures of the middle third of the face, and the book ends with cases illustrating first-aid treatment and certain complications.

The whole text is simplified by the really excellent photographs, showing not only the progress of the patients but the details in the construction of the various appliances used.

## Notes on Books

Dr. R. D. LAWRENCE's book *The Diabetic Life*, first published in 1925, has now reached its 13th edition (J. and A. Churchill; 10s. 6d.). A Wartime Supplement, occupying the first thirteen pages of text, deals with the problems and special difficulties concerned with food rationing and distribution of insulin which the war has imposed upon the diabetic and his doctor. In his preface Dr. Lawrence writes: "By constant revision this book had become, I felt, rather a patch-work affair. So now it has been rewritten, and I have pruned much dead wood and ingrafted fresh in this edition. Its main object is still to be a practical guide in the treatment of diabetes, and theory is kept to a minimum."

The first comprehensive set of recommendations on post-war housing was published on March 24 in the Scottish Housing Advisory Committee's report *Planning Our New Homes* (H.M. Stationery Office; 3s.). The committee, under the chairmanship of Mr. Joseph Westwood, M.P., Joint Parliamentary Under-Secretary of State for Scotland, was asked in 1942 by the Secretary of State to report on the design, internal planning, standard of construction, and layout of new houses and on the provision of furniture by local authorities in municipal houses. This report was presented to the Secretary of State in November last, and Government action on a number of urgent recommendations has already begun. The committee recommends a "three-stage" programme to meet the problem of Scotland's housing needs. The bulk of this report is devoted to a long-term post-war housing policy. It recommends radical improvements in standards of living space in houses of all types, and insists that very great care should be taken to make the house comfortable and convenient.

The report on the work of the League of Nations in 1942-3 by the Acting Secretary-General has now become available in London (George Allen and Unwin, 40, Museum Street, W.C.; 2s.). It reviews the manifold activities of the League in wartime and in preparation for the post-war period. It shows the important work being done, even in wartime, by the international organizations. The fact that the headquarters of the League are situated at Geneva has given it the opportunity of observing much of what is taking place in Europe; and its branches at Princeton, U.S.A., and in London bring it into direct relation with a variety of technical questions closely concerned with current events. The work performed and the publications issued in regard to economic and financial questions, refugees, epidemics, health, nutrition, and narcotic drug traffic are of outstanding value.

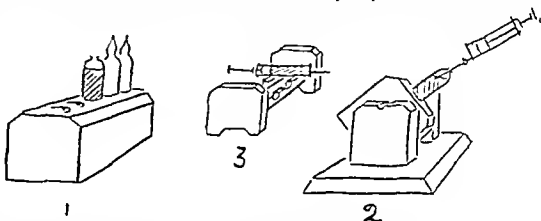
## Preparations and Appliances

### ANAESTHETIC REQUISITES

Major J. FRAULO, R.A.M.C., writes.

To-day, and even more so in the coming months, the need for speed in the preparation of anaesthetics is obvious. An operating period consisting of numerous short cases can be completed much more quickly and easily if the anaesthetist has all his material ready at hand.

Since pentothal is used in the majority of cases, the devices illustrated herewith were made to facilitate the anaesthetic procedure. They have been in use for over a year, and since they can be made of wood in a short time by any amateur carpenter,



and since they can be used by any trained orderly, it was thought worth while to publish them.

Fig. 1 shows an ordinary block of wood drilled to hold five or six ampoules of pentothal. After filling one ampoule with water, the orderly transfers it to the hinged wooden block shown in Fig. 2. This hinged block should be weighted at the lower end so that the ampoule is normally held in a vertical position. When filling, the ampoule is tilted to the required angle, and the entire content is sucked up with ease. Fig. 3 is merely a wooden rack on which several fully charged syringes are laid.

These devices should be of assistance in any clinic where intravenous therapy is employed—e.g., varicose veins and venereal disease.

## THE OPHTHALMIC SURGEON AND THE OPTICIAN

BY

J. P. SPENCER WALKER, M.A., B.M., B.Ch.

*Hon. Surgeon, Sussex Eye Hospital, etc.*

### The Problem

Owing to circumstances which need not be gone into now, for we must look forward and not back, a curious and difficult situation confronts us. In the care of the eye the public find that there are two main groups who offer their services—namely, the ophthalmic surgeons and the sight-testing opticians. I need not go over once more the well-trodden ground of the rival groups, but will content myself with suggesting that up to now our approach, as medical men, to this problem has been wrong. The vast majority have said, or have not contradicted those who have claimed to be their spokesmen, that they will have nothing to do with the sight-testing optician, and all plans that have been tried or suggested have been framed in opposition to him—for example, the National Eye Service sponsored by the National Ophthalmic Treatment Board. This implacable attitude has got us nowhere. One reply to this attitude has been an attempt by the sight-testing opticians to get the Government to form a Register; and another is that if sight-testing by opticians is abolished, men who have taken considerable trouble to study optics and to work for a diploma will lose their means of livelihood. They have made themselves skilled in one occupation; what are they to do if they may not exercise their skill?

Our problem is therefore, How can we give employment to these men, and at the same time give the best service to the public? Can we produce a plan, which can be used whatever form the medical service of the country may take? I submit a plan for consideration.

### The Plan

The ophthalmic surgeon has his well-defined abilities and duties, and the optician his, and there is no essential need for them to be in opposition; but rather they should be, and really are, complementary to each other. The ophthalmic surgeon is concerned to a large extent with the physiological and pathological defects of the eye, and the optician with the appliances used to correct certain of these defects. Thus in a well-ordered scheme both of them should be able to play their part without trespass.

In the plan which I am putting before you the following persons will have their place: the ophthalmic surgeon, the optician, the orthoptist, and the nurse. First we must consider registration. The ophthalmic surgeon is provided for already in his qualification and registration as a medical practitioner. I suggest that the optician in future should receive a diploma from an "Ophthalmic Opticians' Council," which should be composed of opticians and ophthalmic surgeons (in a proportion to be settled later, when the principle of the plan has been accepted), who will be responsible for the training and examination for the diploma as well as for registration. On receiving his diploma the optician will become a medical auxiliary. At first an optician holding a diploma from a body now in existence would be registered by the "Council," but after the starting of the new plan these bodies would cease, and all new candidates would receive their diplomas from the new Council. The orthoptist trainer or orthoptist already has her diploma granted by the Orthoptic Board, which is composed of orthoptists and ophthalmic surgeons. She becomes a medical auxiliary on registration, and this arrangement need not be altered. The nurse likewise is already provided for in this respect.

Here then is our team. Under this plan a patient will visit an ophthalmic surgeon, who will examine him. The refractive error may be found by either the surgeon or the optician, acting as a refractionist, according to the nature of the case or the direction of the surgeon. In either case the optician will add the frame measurements, etc., to the prescription, and the type of frame selected. The completed prescription will be sent to the manufacturer. The spectacles, when ready, will be sent to the optician, and the patient asked to call for the final fitting and adjustment, thus giving the ophthalmic surgeon an opportunity of checking the glasses as well, if desired.

Should the surgeon wish to have an orthoptic report, or prescribes orthoptic training, his orthoptist is there ready. Or there may be some minor surgical procedure needed, such as the removal of a tarsal cyst; then the nurse is there to assist. I do not wish to go into detail, but to confine myself to the principle and outline of the plan. If the principle is accepted, then the details can be filled in, and the duties of each member of the team assigned.

### Argument in Support

From this brief outline it will at once become apparent that have employed all who are in any way connected with the practice of the treatment of the eye, and have divorced those employed from any commercial interest. I also maintain that, though the optician status will be enhanced, and he will have gained much that he present desires—namely, registration and a true recognition—this we have been accomplished without lowering the position of the ophthalmic surgeon. Not only will such a scheme give employment to ophthalmic surgeons and opticians but it is obvious that the number of each will have to be increased, for everyone who wishes to have his eyes examined will go to them and not to a "shop." This, then, will answer the two problems which have been put forward from time to time—namely, the employment of opticians in the "shop" and sight-testing are abolished, and the relief of the ophthalmic surgeon from that type of work, which some, perhaps erroneously, consider hardly within his province.

Such a scheme will obviously make it necessary to change the accommodation employed at present by most ophthalmic surgeons. But that perhaps will not be a disadvantage. Possibly "clinics" could be formed, where all the local ophthalmic surgeons share a common "waiting-room" and each had his own consulting-room which would provide accommodation for the optician and the orthoptist. If possible these might be a part of, or an annex to existing ophthalmic hospitals, or the eye departments of general hospitals. But such developments should not be considered in the present paper.

The opponents of any form of recognition or employment of opticians say that if we have anything to do with opticians we shall be in the same position as the dentists. This statement is ill-considered, for the position of dentists and ophthalmic surgeons cannot be the same unless, at some future time, the former are compelled to be registered as medical practitioners as well as dentists. Also in this plan the optician will be a medical auxiliary, and will not be absorbed into the ranks of the ophthalmic surgeons, which would be impossible, for he is not, and will not be, a registered medical practitioner. It is a pity that people make this kind of statement without thinking, for they not only prevent themselves from approaching a problem with an unbiased mind but they influence others who accept their statements without due examination.

This attitude of hostility is born of fear—fear of their rival, and fear that their case is weak. It is also born of a reluctance to face facts. Opticians do exist. All this fear is unnecessary, for there is work for all. Let any ophthalmic surgeon count how many opticians of all kinds there are in his own district or town, and let him assume that they make a sufficient income to keep their "shop" open, and then let him remember that under this plan every member of the public needing advice will have to be seen by the "team"; then having done this, I cannot understand how he can say that there will not be enough work for ophthalmic surgeons, the opticians, and the rest; or that his position is "lowered." The orthopaedic surgeon is not lowered by his contact with the masseuse.

Under this plan there will be no dispensing and no sight-testing opticians as at present, but ophthalmic opticians, who will be registered medical auxiliaries; and, as there will be no "shop," the commercial aspect will not rear its ugly head. I maintain that the patient will have at his disposal a service such as he has not had up to now, and that this scheme can be adapted so that it can be used by any form of "National" Medical Service which may be introduced, whether part-time, or whole-time.

Since I started working out this suggested plan, and before its publication, Mr. Frank Heckford of Ryde startled some ophthalmic surgeons with a suggestion very similar to mine. I was in some doubt whether to proceed with "my" plan or not; but I decided that I would, because if two people say the same thing it may carry more weight than if only one says it. I wish therefore to make it quite clear that I do not want to rival him but to assist, and that I do not claim any originality, but merely that my ideas have been evolving for a long time, even before this present war. Mr. Heckford's suggestions have been labelled "revolutionary" as against "evolutionary," but even evolution must at times appear to be revolutionary; to acquire a prehensile nose strikes me as revolutionary, but it was evolved, apparently, in the elephant.

J. W. Howard (*Amer. J. med. Sci.*, 1943, 206, 735) records these cases of carcinoma of the duodenum in men aged 48, 65, and 80, one of whom it was associated with erosion of the superior mesenteric artery. The rarity of the condition is shown by the fact that of 10,340 cases of carcinoma of the intestines the incidence of carcinoma of the small intestine was only 1.47%. Of 163 cases of carcinoma of the small intestine the duodenum was affected in 37%, the jejunum in 35%, and the ileum in 28%. It is generally agreed that duodenal carcinoma does not follow pre-existing ulcer and is seldom associated with polyposis.

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## AMOEBIIC DYSENTERY

Frank Hewlett, writing in the *New York Times* of April 1, 1942, on the fall of Bataan, stated: "It was malaria and dysentery—not Japanese tanks and dive-bombers, or bayonets—that told the final story." Such a statement is open to dispute, but there is no doubt that the control of transmissible diseases, and especially of tropical diseases, as in this war, as in many wars of history, affected the results not only of local engagements but of the campaign as a whole by determining the numbers and movements of the troops engaged. The two diseases referred to by Hewlett, malaria and dysentery—or more correctly three diseases, since we must distinguish between amoebic and bacillary dysentery—are often spoken of as the most important of the "tropical diseases." But their ravages extend far beyond the Tropics, and their control is to-day a matter of first importance on almost every front where our troops are engaged. Bacillary dysentery is by no means unimportant on the home front, as the mounting figure of notifications during this war has shown.

The causal micro-organisms and method of spread from man to man have long been known in the case of malaria and bacillary dysentery, and the knowledge thus acquired has been effectively applied. But amoebic dysentery is in a somewhat different case. In 1875 Lösch named an amoeba found in the stools of patients suffering from dysentery *Amoeba coli*, but whether this was the cause of dysentery was discussed inconclusively during the next eight years, largely because of failure to distinguish between the harmless *E. coli* and the pathogenic *E. histolytica*. Koch's discovery, in 1883, of their presence in sections of dysenteric ulcers and in the walls of liver abscess supported the view that at least certain amoebae were pathogenic. In 1886 Kartulis in Egypt found amoebae in 150 cases of dysentery, and in sections of the ulcers from twelve fatal cases. In 1899 Quincke and Roos described the cysts of *E. histolytica*, and found that cats were infected by swallowing the cysts, whereas the vegetative form was infective only when introduced directly into the rectum. The final proof of the transmission to man was supplied in 1915 by Walker and Sellards, whose careful experiments proved that, when cysts of both *E. coli* and *E. histolytica* were swallowed by human volunteers, a high proportion of the volunteers became parasitized; but in no instance did those successfully parasitized with *E. coli* develop dysenteric symptoms, whereas four of the eighteen parasitized with *E. histolytica* eventually did.

The causal organism having been described, and its power to infect man when swallowed in the form of a resistant cyst demonstrated, it remained only to establish how the parasite was conveyed from man to man. This final link has proved surprisingly difficult to establish: water supplies, food and food-handlers, flies, reservoir hosts, and direct transfer have all been suspected; but the organisms have not been found except associated with

flies, reservoir hosts, or man. There is evidence that viable cysts are passed by flies after feeding on infective faeces, and since they have been found thus infected in nature it appears reasonable to believe that they play an important part in the transmission of the disease. Although the disease occurs in dogs, cats, and monkeys, there is no reason to believe that any of these animals are of significance in maintaining the disease, and it is probable that man is the only important reservoir. The difficulty of associating the human carrier with the spread of the infection is probably due to the fact that parasitization is not necessarily associated with the development of dysentery, so that it is often impossible to trace the source of infection in an individual who develops symptoms of the disease months or even years after exposure. It is tempting to conjecture that infection takes place through the swallowing of cysts adhering to uncooked food substances or present in contaminated water, particularly since we have proof that, under favourable conditions, they can survive for a long time in these. We may recall the outbreak of amoebic dysentery in Chicago in 1933, when over a thousand persons became infected apparently through drinking contaminated water. But although much has been written little has been proved regarding the normal method of infection; anything which adds to our knowledge, and so helps to strengthen our control of the disease, is to be welcomed.

During 1940 and 1941 Dr. Grace Ivanhoe<sup>1</sup> undertook a thorough investigation of the continued high incidence of *E. histolytica* infection among some 130 children, aged up to 6 years, living in an infant asylum in New Orleans. The history of the constantly extending amoebiasis in this institution is somewhat remarkable. In 1931 9% of the children were infected. Annual inspections from that date onward showed a progressive, though irregular, rise to the year 1939, when no less than 84% of the children were infected. Examination of the hygiene system adopted in the institution at first brought to light no reason for this persistent parasitization; in all respects the institution appeared to be clean and well kept. The water and sanitary systems were examined by engineers and found to be perfect; the rooms were cleaned with daily dusting and thorough house cleaning once a month; the laundering was done on the premises in a satisfactory manner; and the children's playground and bathing and wading pools appeared clean and well tended. The bed linen was changed almost daily, and night clothes three or four times a week. Underclothes were changed every day, and more often if needed. The children had individual washcloths, towels, and tooth-brushes. The youngest children had individual toilet pots, and the older children small flush-closets. At this stage one or two points regarding hygiene which at first were thought to be satisfactory proved on further investigation to be defective. Thus, in theory all the children were taught the use of toilet paper, and the process of defaecation among the little children was supposed to be under constant supervision. In practice it was found that this supervision was insufficient. Only a small proportion of the children used the toilet paper, and their underwear was often soiled with faeces. Again, it was found that in practice the pyjamas, which were sup-

<sup>1</sup> *Amer. J. Trop. Med.*, 1943, 23, 401.

posed to be changed daily, were changed only twice a week unless grossly soiled, and, acting on the notion that clean pyjamas were issued daily, no arrangements were made for individual possession. Dr. Ivanhoe then went on to discover from what sources the escaped parasites were recoverable. In order to do this two methods were employed: the Foerst centrifuge was used to separate matter from water media, and NIH swabs were used to obtain matter for examination directly from objects. Then followed a laborious and prolonged examination of the material thus obtained. *E. histolytica* cysts were recovered from the hands and from the soiled underwear of the older children, from the dust at the bottom of the laundry chute, from the damp sand in their play-box, from the water in the wading and bathing pools after the children had left them, and from the concrete floors of both wading pools. This intensive survey reaped its just reward. Armed with the knowledge of the source of infection, the sanitary authorities thoroughly cleaned the home by steam spray twice in eight days, and then again after mass treatment of the inhabitants had been completed. "Four weeks after completion of the treatment the examination of one specimen from each of the children by means of the direct faecal film and zinc sulphate centrifugal flotation technique indicated that not a single stool specimen was positive." The author suggests that these results indicate that the use of live steam to sterilize the environment, together with anti-amoebic mass chemotherapy, constitutes a simple and practical means of controlling amoebiasis in institutions.

### UTTERLY MISTAKEN

Speaking on the National Health Services proposals at Birmingham last week, Mr. Willink, Minister of Health, concentrated on what he called "two utterly mistaken ideas." The first was an idea held by doctors that the Government's proposals would end in converting the medical profession "into some sort of State-controlled and regimented service." The second was that these proposals would "ruin the voluntary hospital movement." Mr. Willink straightway said that nothing could be further from the truth, and he personally would not be party to any proposals which would have such an outcome. "I know that variety and professional freedom are the life-blood of any great profession—variety of personality in it and of individual professional method, scope for private enterprise in the best sense of that term. I know that a profession needs these things . . . if it is to attract the right people and to keep on achieving the highest results." In the new service, he said, doctors must be free to do their professional work in their own individual ways. There should be no risk of their becoming units in a machine, but they should "remain individual professional people in individual and personal relationship with those who seek and want their professional care."

As our correspondence columns with mounting emphasis are beginning to show, the medical profession at large is indeed anxious on these points, and, so far as it goes, will welcome the reassuring statement Mr. Willink has made. While our negotiators might reasonably expect to obtain

a sympathetic hearing from a member of a great profession which itself shows no desire to be regimented, must nevertheless face realistically the evidence present to us in the White Paper, and in the pictorial edition of at Charing Cross Underground Station. The prominent feature in the exhibition set up there about three weeks ago is a large-scale model of the health centre, the place where "to-morrow's doctors will work" and, as a diagram, shows, for a salary. But soft words butter no parsnips, and, with all respect to the Minister's assurance, it is not easy to see how in the long run general practitioners of this country can escape regimentation and control by the State in a complete service paid out of the public funds and based upon health centres owned by local authorities. The Minister believes that the good features in private medical practice do not depend upon the charging of fees, and that the freedoms doctors cherish could be kept even though the method of payment is changed. It is not so much a question of fees as against salary—although payment by fees has the virtue of stimulating a man to keep on his toes—as the relationship between the body that pays the salary and the person who accepts it. He who pays the piper calls the tune, and if the paymaster turns out to be a Government Department (or its autocratic Central Medical Board), or a so-called democratic local authority, then doctors rightly tremble for the future of their ancient profession.

Mr. Willink was emphatic in denying that it was the intention of the Government to harm the voluntary hospital movement. "It is," he observed, "the very essence of our proposals for the hospital service that it should rest on both the existing hospital systems carrying on side by side. . . . We are proposing that the voluntary hospital should remain, as they are now, self-governing and independent institutions." The Government did not propose that the voluntary hospitals should be taken over by local authorities. The voluntary hospitals would take part in the new service as free organizations, "entering into a contract with a public authority to perform certain services, for which they would receive payment from both the Exchequer and the local authorities." The Government did not intend to pay the whole of the cost of the services rendered by the voluntary hospitals, because if they did "voluntary support would no longer be needed." Many regretted the disappearance of the contributory schemes, but they could not restrict the "new universal service" to enable these schemes to continue.

The first reaction of many to the White Paper was to give it a cautious welcome, and this we must extend to Mr. Willink's statement last week—but cautiously nevertheless.

### TREATMENT OF SHOCK

Laboratory workers on traumatic shock may study conditions directly related to war or civil injuries in man, such as haemorrhage, burns, or crushing injuries. On the other hand, techniques may be used which have no counterpart in human injury, such as histamine or adrenalin poisoning, intramuscular hypertonic salt injections, etc. The latter indirect techniques serve as valuable controls on the direct methods, and analyses of the results often provide helpful clarification of the nature of various phenomena of wound shock.

Muirhead, Kregel, and Hill<sup>1</sup> produce "shock" by an direct technique. A dog's hind limb is frozen. In three hours after freezing the "permeability" of capillaries is creased locally with gross swelling of the limb due to asma transudation. Haemoconcentration and lowering blood volume result, and the animal dies a few hours ter in "shock." The condition may best be compared ith the early acute stage following burns or crushing juries. Their experimental observations on therapy are chiefly as follows: (1) Amputation of the limb after haemoconcentration has developed, but before hypotension sets in, fails to save life. (2) An infusion of approximately 30 c.cm. three-times concentrated plasma given in divided doses during the fourth hour also fails to prevent a fatal outcome. (3) If amputation is combined with the plasma infusion, haemodilution is achieved and survival usually follows. A simple interpretation of these main findings is easy to suggest. Oligoemia results from plasma transudation in the injured limb. Once haemoconcentration has developed amputation can have little effect in correcting the circulatory state. A single plasma infusion may also exude into the tissues of the injured limb. The same phenomenon may be seen in man in burns and crushing injuries, in which multiple serum or plasma infusions are often required to restore and maintain the blood volume. If the injured limb of the dog is removed the infused plasma is retained, with lasting benefit.

In the animals which died after experiments (1) and (2) the pathological changes were of great interest: hyaline casts in the medullary tubules of the kidneys and centrilobular necrosis of the liver bring to mind the lesions seen in both burns and compression injuries. While the changes in the liver may be explained by the low flow of blood and consequent tissue anoxia of hypotension, the renal damage and other tissue changes, e.g., in lungs and suprarenals cannot be so readily accounted for. There is undoubtedly re-circulation through dead tissue in the frozen limb, and, in addition to loss of plasma, autolytic products diffuse into the general circulation with possible toxic effects on various organs and tissues. This work seems to open up a new method for study of the remote effects of tissue autolysis after necrotizing injury.

Some interpretations by the authors are open to question. When the haemoglobin fails to be diluted as much as expected after plasma injection they interpret this phenomenon as "mobilization of corpuscles." A more rational explanation would be loss of infused plasma from the circulation. The work of Sharpey-Schafer and Wallace<sup>2</sup> on man indicates that quite massive shifts of protein-containing plasma may take place into and out of the circulation with extreme rapidity. The bogey of "trapped" corpuscles in various parts of the circulation in shock is fortunately becoming a rather threadbare shadow of its former self.

### BOOKS FOR PRISONERS OF WAR

Readers who have sent gifts to the Medical War Relief Fund for the special purpose of providing medical books for British doctors who are prisoners of war will be glad to know that the money contributed has not been lying idle. On the contrary, the greater part of it has already been spent, and the time is approaching when the balance remaining will be exhausted. Requests continue to arrive from the prison camps, and the letters from prisoners who have already received gifts of books leave no doubt as to the value of this form of help and the gratitude with which

it is received. The Committee is anxious that the primary object of the Fund—the relief of financial distress—should not suffer through the diversion of money to the special purpose of providing books for prisoners of war, and only specially marked donations are used for the latter purpose. The Committee will be grateful if subscribers, while continuing to support the main object of the Fund, will send additional contributions marked for the provision of books. The need is becoming urgent. Cheques should be made payable to the Medical War Relief Fund and addressed to the Honorary Treasurer of the Fund at B.M.A. House, Tavistock Square, W.C.1.

### ABSENTEEISM AND PREVENTION OF FATIGUE

The second pamphlet published by the Industrial Health Research Board on conditions for industrial health and efficiency<sup>1</sup> is divided into two parts. The first relates to "Absence from Work" and the second to "Prevention of Fatigue." Both subjects are dealt with in a simple but most instructive manner, which can easily be understood by anyone, factory worker no less than factory manager. The pamphlet is attractively produced, like its predecessor (which dealt with "Ventilation, Heating, and Lighting"), and it is likely to command a wide circulation. The information is to some extent based on investigations made in sixty factories, one of them having 25,000 employees, and it is concluded that under wartime conditions the absenteeism is almost certain to be greater than in peacetime, a reasonable absence amounting to 6 to 8% for men and 10 to 15% for women. Factories vary much in their accessibility, some of the large new factories in particular being a long way from the homes of the workers, and transport overcrowded and unreliable. Married women may show three times as much absence as single women, owing to the extra calls on their time for shopping, housework, and the care of children. Health is often affected by factory conditions, mental no less than physical, and these conditions can generally be improved in various directions. The boredom set up by the repetition work on which so many munition workers are employed can be reduced by the introduction of a 10-minute break in the middle of each work spell, and by occasionally relaying lively music; it is also well worth while to try, so far as possible, to see that the job fits the person, and to arouse interest by letting the workers see the finished product they help to make. Health can be improved by the workers, when off colour, seeking advice from the works doctor, and in buying varied and nourishing meals, while women with families should aim at half-time work.

The second half of the pamphlet discusses the relation between boredom and fatigue, and their influence on output. One of the most potent influences is the length of the working week, and the conclusion is reached that the weekly hours of work should not exceed 60 for men and 55 for women. For certain classes of workers, in particular for heavy manual workers and women with home duties, these hours are still too long. A week-end break is important, and working hours should be spaced over a five-day or five-and-a-half-day week. Workers suffering from the effects of cumulative fatigue should be given a rest of a week or fortnight at one of the country houses which have been taken over for this purpose. Thereby illness and breakdown may be avoided. It is stated that at present there are no signs that boredom or fatigue in industrial workers has reached dangerous proportions: but both are increasing, so safeguards ought to be taken.

<sup>1</sup> Arch., Surg., 1943, 47, 255.  
<sup>2</sup> Lancet, 1942, 1, 699.

<sup>1</sup> Conditions for Industrial Health and Efficiency. Pamphlet No. 2 H.M.S.O. 1944. (3d.)



The one adverse criticism we have to make concerns the date of the publication of the pamphlet. It would have been so much more useful if published some two years ago, there being practically nothing in its contents to preclude such a course.

## MEASURING INTELLECTUAL DETERIORATION

Intellectual deterioration is a suspected sequel of many organic cerebral and some purely mental disorders; indeed, it is said by some to be the main cause of maladjustment to life during recovery from a head injury or other cerebral accident. It is, however, by no means easy to determine by ordinary clinical methods the nature and degree of such impairment. If mental tests could give an objective answer to these questions they would be valuable in prescribing treatment and in recommending suitable employment; the progress of a case could be followed and a more accurate prognosis given. Moreover, a quantitative measure of intellectual damage after an injury might be a useful guide in the assessment of claims for compensation and pension. Of the test procedures at present in use for this purpose most require special knowledge and take too long to administer to be of use to the average doctor; on the other hand, it seems unlikely that any single test would give a reliable enough measure of such very complex material. Brevity and simplicity are of prime importance; the results should be capable of quantitative evaluation; and current opinion seems to favour a battery of short and simple tests.

Most of the published work on this subject records the qualitative abnormalities shown by tests of patients suspected on clinical grounds of organic impairment. Such abnormalities may be due to organic deficit, but it is dangerous to assume without statistical backing that all subjects showing similar deviations from the normal are also intellectually impaired. There is in this branch of research a need for carefully planned and controlled experiments; the great variability of normal performance in mental tests, both between different individuals and in the same person under different conditions, makes it more than usually hard to interpret the results of such tests in psychopathological states. Indeed Goldstein,<sup>1</sup> reporting the results of such work in patients with brain injuries after the last war, states that it is not possible to judge the subject's capacities by the end-results of the tests he uses—that it is not what the patient does but how he does it that matters; this may be an extreme view. The basic hypothesis on which most of the quantitative work in this field rests is that a person's vocabulary and other types of rote knowledge is less affected by age and degenerative cerebral conditions than more recently acquired information.<sup>2</sup> If, therefore, there is found to be a discrepancy between the score on a standardized vocabulary test and those on tests of active mentation, this discrepancy is assumed to be due to intellectual deterioration. Using this principle, Lidz, Gay, and Tietze<sup>3</sup> have compared the results of tests of patients suffering from organic deteriorating conditions with those of schizophrenics. As a measure of their subjects' capacity for active mentation they have used the Kohs block test,<sup>4</sup> which, they point out, has the advantage of being a well-standardized performance test singularly free from the influence of past experience. The scores on this test are compared with

those on the Binet vocabulary,<sup>5</sup> and it was found that the Kohs scores were significantly lower than the vocabulary in the organic than in the schizophrenic group. This finding is interpreted as showing that the thinking disorder of schizophrenics ought not to be included in the disabilities following damage to the brain.

The authors draw attention to the fact that their conclusions depend on the assumption that a normal control series would not show this discrepancy. If such prove to be the case, and if emotional factors as a cause of the discrepancies could be ruled out by examining a comparable series of psychoneurotics, the method they advocate might prove a valuable aid in the estimation of organic intellectual deficit.

## THE QUEEN'S NURSE

Charles Booth, in his *Life and Labour of the People of London*, remarked that it was "almost true to say that wherever a nurse enters, the standard of life is raised." Since the Queen's Institute of District Nursing was founded at Queen Victoria's first jubilee, the Queen's nurses have helped to raise the standard of life in a way not generally recognized. The visit of the Queen's nurse is not only effective in what she does for the patient's immediate need but in the atmosphere she brings with her and the example she sets. What the nurse says and instructs to be done is accepted by the patient, and the knowledge is passed on to family and neighbours. This has been a factor in social improvement perhaps more important than some of the other factors to which one commonly attributes the progress of the people towards healthier living. The Queen's nurse is different from the hospital nurse, not merely because the one has a domiciliary field of work and the other an institutional, or because the one is the guest of her patients and the other is the hostess, but because the nurse on the district, in addition to her three years' training in hospital, has spent a further six months in the study of the special problems of home nursing; and if she is the right type, as she generally is, she has great opportunity to give her patients advice beyond the matter of the immediate ailment.

A sixpenny illustrated pamphlet has now been published by the Queen's Institute (57, Lower Belgrave Street, S.W.1) to introduce the district nurse to a public which, though familiar enough with her navy blue uniform and badge, may not know very much about her work. She is organized through county and district nursing associations affiliated to the Queen's Institute. In towns her work is mainly general nursing; but in seventy towns midwifery is also undertaken, and midwifery forms an important part of the work in rural areas. In the midwifery service undertaken by the Queen's nurses in 1942 the maternal mortality rate was only 1.17 per 1,000 births. Some day, perhaps, the heroism of the home-visiting nurse in wartime will be commemorated. One incident is mentioned in this pamphlet. In the devastating air raids on Coventry the nurses' home was completely demolished, and the military authorities—perhaps not expecting to be obeyed—advised the nurse to leave the city. The nurses did nothing of the sort. They stayed on, living in an air-raid shelter and clambering about among the ruins to find their patients. On every housing estate in the replanned Britain there ought to be a nurses' house, as certain to be found there as the office of the estate agent or the manager, where one or more nurses could live. The general practitioner would be the first to welcome such an arrangement.

<sup>1</sup> *Brain Injuries in War*, 1942, London.

<sup>2</sup> Babcock, H., *Arch. Psychol.*, 1930, No. 117, New York.

<sup>3</sup> *Arch. Neurol. Psychiat.*, Chicago, 1942, 48, 568.

<sup>4</sup> *Intelligence Measurement*, 1923.

<sup>5</sup> Terman, L. M., *The Measurement of Intelligence*, 1916, New York.

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References—<sup>1</sup>"Medical Annual," 1943, p. 63. <sup>2</sup>"Essentials of Modern Surgery," Handfield Jones, 2nd Edition, 1943. <sup>3</sup>Lister Memorial Lecture, 1939, "British Medical Journal," 1939, April 15, p. 762.

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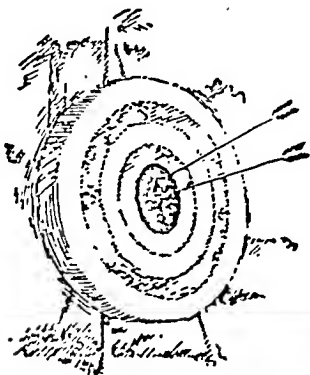
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References: Jour. of Mental Science, Jan. 1941; Jour. of Mental Science, Jan. 1942; Practitioner, Sept. 1942.

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## REHABILITATION OF HEART CASES

MEMORANDUM BY CARDIAC SOCIETY

*The memorandum on the rehabilitation of cardiac patients printed below has been approved by the Council of the Cardiac Society of Great Britain and Ireland. It is signed by the chairman, Sir Maurice Cassidy, and the secretary, Dr. Maurice Campbell.*

Many patients, those with fractures for example, derive great help from efficient rehabilitation. Without it they may be handicapped for long periods; with it most of them may be enabled to undertake all activities and to resume their normal work. The success achieved in this direction has led to the suggestion that similar methods should be used more widely, and the Council of the Cardiac Society felt the time was opportune for expressing their views and bringing forward some questions for wider discussion.

Patients with heart disease are in rather a special category as regards rehabilitation. In the first place any activity, including walking or other forms of physical effort, must automatically increase the work done by the heart. If the patient is going to recover completely—e.g., after some temporary infection—cardiac recovery will often proceed *pari passu* with recovery from the infection and no more than simple graduated exercises may be needed to ensure it; in fact he may need limiting rather than encouraging in his rate of progress. In other cases complete recovery may be impossible and it may be most important that he should not return to his previous work and activity.

Further, the correct diagnosis of the condition of the heart and especially of the heart muscle, and the correct assessment of the cardiac reserve, are of fundamental importance, and harm may be done by too much or by too little activity at any particular stage.

## Limited Scope for Rehabilitation

In our opinion there is only limited scope for rehabilitation, as the term is now being employed, for patients suffering from organic cardiovascular disease. Physiotherapy and graduated exercise are of course useful but must be supervised by a doctor with special knowledge of heart disease. The main problem is the decision as to how much general activity should be allowed, and this depends more on the success of the doctor in charge in diagnosis and assessment of the patient's cardiac reserve than on the availability of skilled assistants in physiotherapy or occupational therapy. The need for suitable convalescent homes is of course generally accepted.

There are, however, cases in which the heart is temporarily under suspicion, which fuller investigation proves to be unjustified—e.g., systolic murmurs which the inexperienced may hesitate to disregard but the experienced are able to label as "insignificant." In many such cases all that is necessary is for an authoritative opinion that the heart is normal and that the patient is, therefore, capable of leading a full active life, but in others rehabilitation may be needed. There is also scope for rehabilitation in the case of effort syndrome, which is at least as common in civil life as under Service conditions, though here it may appear diagnosed as "cardiac anxiety state," "traumatic neuroasthenia," or "post-influenza tachycardia." But we suggest that the rehabilitation of these patients, whether by graduated exercises or by simple psychotherapy, should not be carried out at cardiac clinics, once it has been decided that there is no organic disease.

We suggest, therefore, that there should be more well-staffed and well-equipped out-patient cardiac clinics at general hospitals, preferably under the care of an experienced cardiologist. Here a correct diagnosis could be made, and the patient could be advised about suitable employment and be kept under observation when engaged in such employment. The help of the almoner's department would often be useful. If necessary the patients could receive specialized treatment that experience has shown to be more satisfactory in cardiac clinics, such as the treatment of auricular fibrillation with digitalis or of congestive failure with mercurial diuretics, or the control of symptoms of early angina.

## Work for the Partially Disabled

Special difficulties may arise in finding suitable work for patients with some permanent limitation as a result of heart disease, and this is a problem that should be discussed. Many such persons, especially the younger ones with rheumatic heart disease, are precluded from those occupations which are most appropriate to their condition—e.g., Civil Service, banking, and insurance. They are, therefore, forced to take less suitable work for which no medical examination is necessary and in which their health may break down. Alternatively, they are out of employment and the nation is losing citizens who might give valuable service for a considerable number of years.

We recommend that where a patient is fit for particular work his acceptance should not be impossible because he has valvular disease which precludes his joining an ordinary life assurance scheme; it

should be possible to make special arrangements for accepting such patients in some branches of the Civil Service, banking, etc.

Another difficulty is with the older patient who is beginning to be incapacitated by early signs of failure or angina or by such lesions as hypertension, arteriosclerosis, or myocardial disease which may lead to failure if his previous employment is no longer suitable. Such a patient would often be better at work and would like to be at work, but cannot find anything because he is not fit for the heavy work that he did before.

We recommend that there should be some industrial advisory board or Government Department through which arrangements could be made to ensure that these partially disabled patients could obtain suitable work, after, when necessary, appropriate special training. Often this would not be necessary and the patients' previous employers might be able to carry out the medical recommendations, especially if they were safeguarded against claims against them under the Employers' Liability Act in the event of a breakdown of an employee known to be suffering from heart disease.

The special care of rheumatic children is being dealt with elsewhere in a separate memorandum.

## Nova et Vetera

## EARLY BRITISH PHTHISIOLOGISTS

At the March meeting of the Section of the History of Medicine of the Royal Society of Medicine Prof. S. LYLE CUMMINS read a paper in which he dealt with five British workers who had given to the world epoch-making work on the aetiology, pathology, and treatment of tuberculosis.

Prof. Cummins dealt first with Richard Morton (1637-1698), who published his *Phthisiologia* in 1688. Morton was one of the first to appreciate the importance of phthisis and the necessity for carrying out post-mortem examination on the bodies of such patients. He entered the church as a young man and was ejected from his living in 1662. Thereafter he studied medicine and eventually became a Physician-in-Ordinary to the King. Morton recognized that, in the acute tuberculosis which was common in his day, the lungs might be full not only of ulcers but also of tubercles. In his post-mortem examinations he saw these tubercles in the glandular parts. In describing the symptoms and signs of phthisis Morton noted that the following were early features: The disease is more hereditary than any other; spitting of blood; continued loss of appetite; frequent catarrhs without obvious cause. His views on treatment were essentially rational. He recommended prudence in eating and drinking, early to bed and sound sleep, moderate exercise, an avoidance of strong purges, the maintenance of a cheerful disposition, and the enjoyment of "an open, fresh, kindly air."

Benjamin Marten published his *New Theory of Consumptions* in 1772 and went far to anticipate the subsequent discoveries of Villemin and Koch. Marten brushed aside all theories of causation which depended on the acidity or alkalinity of the humours, and suggested that "the original and essential Cause . . . may possibly be some certain species of Animalcula or wonderfully minute living creature" which are either carried to the lungs by the blood or are generated there from ova. It is important to note his suggestion that these animalcula "are for the most part either conveyed from the Parents to their Offspring or communicated immediately from the diseased Persons to sound ones. . . . The last way, which is properly called Infection, we may conceive to be the more reasonable." This is one of the brilliant flashes of inspiration which were lost in darkness for many years.

In dealing with William Stark (1741-1770) Prof. Cummins noted that, although he was a physician of St. George's Hospital, the hospital has now no record of his work there. Stark studied first in Glasgow and Edinburgh. He was the first to observe in the diseased body the method whereby the tuberculous nodules could cause advanced disease and death. He described the avascularity of the tubercle and made a very minute study of cavities. Small cavities are "quite shut up"; larger ones—which he called "vomicae"—frequently communicated with bronchi. Stark also described the thickening of the pleura over superficial cavities. There is no doubt that his work was of paramount importance in unravelling the pathology of phthisis.

George Bodington (1799-1882) belonged to an old Warwickshire yeoman family, and he settled in practice in the county. In 1836 he became the proprietor of a private asylum, and four years later he published his pamphlet on *The Treatment and Cure of Pulmonary Consumption*. Bodington was the first to suggest open-air treatment. He had a house for the purpose, and his treatment consisted of good fresh air, a sufficiency of wholesome food, and a definite quantity of wine, with a sedative (opium) to ensure sleep and to calm apprehension when necessary. He suggested and practised the specialist treatment of tuberculosis. At the time the medical profession howled Bodington down, but he now stands for the system which is at last tending to control tuberculosis.

Prof. Lyle Cummins also referred to the brilliant suggestion which William Budd of Bristol made, in 1856 that phthisis is a specific zymotic disease which can be disseminated by specific germs in the tuberculous matters of sufferers. Budd did not publish his letter to the *Lancet* on this matter until 1867, and by that time Villemin was following the same trail to a successful issue.

## Reports of Societies

### ANAESTHESIA FOR ABDOMINAL OPERATIONS

A combined meeting of the Sections of Surgery and of Anaesthetics of the Royal Society of Medicine was held on April 5, Sir JAMES WALTON presiding, for a discussion on "Anaesthesia and Analgesia in Abdominal Operations."

Surg. Rear-Adml. G. GORDON-TAYLOR opened by drawing a half-serious, half-humorous picture of the modern anaesthetist, whom for versatility he compared with Leonardo da Vinci and the Admirable Crichton. Besides the large amount of technical knowledge and resourcefulness demanded of him, he was expected to be able to radiate comfort to the patient and to utter words of encouragement in simple language to the surgeon. Anaesthetists, if not a group of supermen, were in his experience as a surgeon the most loyal and delightful of colleagues.

The methods, vehicles, and agents of anaesthesia were legion, and there were few surgeons who had experience and time to evaluate the ever-changing kaleidoscope of anaesthetic activity. The task was not made easier by the absence of any exact criterion for judging the claim of a particular medium to be better or the best. It might have been thought that the figures for operative mortality would provide an index for appraisal of the value of a particular form of anaesthesia, but operative mortality depended on many factors besides the anaesthetic and the mode of its administration. Much had been heard of "balanced anaesthesia," and it might be thought that herein lay the talisman to solve the quest for the best anaesthesia. "Balanced anaesthesia" was certainly a euphonious term, one which must create confidence and expectation in the bosom of the patient, but it was surely only a novel name for an old concept and practice, with this difference, that the pharmacological admixture had now run riot. The former generation of workers was apt to be forgotten. Forty years ago George Crile first toyed with the idea of the shockless operation. Since 1914 the speaker himself had been an adherent of the Crile school, and he continued on the same lines with the loyal co-operation of his anaesthetist colleagues. He would not enter upon a comparison of methods which were perhaps not really comparable, but rather give an account of his own experience in abdominal surgery. Many abdominal operations, especially the surgical treatment of malignant tumours of any size in the abdominal wall, must be extensive, and without regional anaesthesia great shock would be produced. So far as the abdominal wall was concerned, he had contented himself with the rectus block along the outer border of the muscle and the lower costal margin, and thus obtained the degree of relaxation of the abdominal wall that he desired. During the last twenty years he had used novocain almost entirely. Novocain had the disadvantage that its duration was not unlimited (and the average gastrectomy took him an hour and ten minutes). In addition to the regional and solar plexus block he liked to keep his patient slightly under general narcosis with a little ether and chloroform, never getting the patient deeply under. He always had a bias against a mask over the patient's face for any long period. For "bad risks" and cases with severe haematemesis, operation should be carried out under local and splanchnic block without any general narcosis.

Adml. Gordon-Taylor then gave some statistics of various surgeons. He mentioned the figures of Yudin of Moscow for gastro-duodenal resections and acute perforated ulcer, carried out under high spinal anaesthesia, 331 cases, with 21 deaths (6.3%). Duval in Vienna claimed 125 gastric operations for ulcer, and Haas of Munich 250 such operations, in each case with no deaths, regional and splanchnic anaesthesia being employed. H. W. L. Molesworth in this country reported 119 gastric operations (ulcer) under local and splanchnic anaesthesia, with 3 deaths (2.5%); W. J. Ferguson at West Middlesex Hospital, 202 with 7 deaths (3.5%); and Norman Tanner at St. James' Hospital, Balham, just under 100 with 4 deaths, and a later series of 120 with 1 death, which last remarkable record he attributed partly to the prophylactic use of sulpha-

pyridine. Adml. Gordon-Taylor mentioned 794 of his cases over a period of 18 years, in which there had been 52 deaths; he had not thought the death rate was as high as 6.3% until he came to work it out, but he was comforted by the fact that in a later series, 1938-44, of 148 cases including gastric and duodenal ulcer of all types, there had been only 4 deaths (2.7%).

In many regions of the abdomen the question of anaesthesia counted less than other factors. For operations on the gall bladder—simple cholecystectomy—he had never used an anaesthetic except general inhalation and regional. With obstructions of the common duct it was important to avoid ether and chloroform, and he used gas-and-oxygen supplemented by good regional and solar plexus block. In carcinoma of the colon the actual choice of anaesthesia mattered very little; the skill and methods of the surgeon were much more important. Nothing could vie with local anaesthesia in the case of strangulated hernia. He added a few words on anaesthesia in war. An old slogan of his was, "In a man wounded in the belly spinal anaesthesia is certain euthanasia," and he did not depart from that opinion. Conversations with surgeons recently returned from the Mediterranean confirmed their truth in ether. He was a little surprised that the work of Crile during the last war with gas-and-oxygen and regional anaesthesia had not been repeated. Crile's recovery rate in the last war far exceeded that of any other abdominal surgeons on the western front. But the figures from surgeons in the Mediterranean did not fall far short. In the Navy the problem was slightly different. On H.M. ships there was always a risk of explosion, and therefore, in the smaller craft at any rate, ether anaesthesia seemed to be forbidden. Here he acknowledged the help of the Oxford vaporizer machine, which had permitted operations on some of the rescue ships to be successfully performed.

### Abdominal Relaxation

Dr. FRANKIS EVANS said that anaesthesia in abdominal surgery might be considered essentially in terms of relaxation. No surgeon could work properly inside the abdomen unless the muscles were adequately relaxed. As Lord Moynihan used to say, "The surgeon should never need to fight the patient." The anaesthetist's duty was to master the various techniques he might be called upon to use. Abdominal relaxation might be obtained in many ways. The choice of inhalation anaesthetics was far greater now than twenty years ago. Ether was an old friend if a somewhat malodorous one. It had been stated that from 65 to 72% of patients vomited after ether anaesthesia. It was wrong to give ether to a chronic bronchitic. Chloroform was, of course, more toxic than ether. Gas-oxygen alone did not give abdominal relaxation. Where ether was used with gas-oxygen to give relaxation the gas-oxygen was, of course, only the vehicle. Cyclopropane was "the answer to the anaesthetist's prayer," but he had not always been able with cyclopropane to obtain the degree of relaxation required, and had added a little ether—but a little ether went a long way. Describing the technique of the adrenaline drip, he said that this should be in the strength of 1:250,000 in normal saline. It was advisable not to add the adrenaline to the saline until the drip had got going; in other words, one should not start with adrenaline straight away. The average rate of drip was 50 to 60 a minute. The drip should certainly be continued for two hours, perhaps longer. The longest time he had carried out an adrenaline drip was something like 18 hours; the patient was very ill, and the procedure proved satisfactory. Intravenous pentothal had proved of great use, but he did not recommend it for the "desperate risk."

Mr. NORMAN LAKE said that the use of anaesthesia was twofold: to prevent the patient feeling pain, and to enable the surgeon to perform the operation with facility. The modern anaesthetist in his proper desire to achieve the first object had sometimes neglected the second. Many post-operative sequelae laid at the door of the surgeon might be related rather to the anaesthesia. Some complications were said to be due to "rough handling" of the viscera, but it should be inquired why rough handling was necessary. Unsatisfactory anaesthesia with a rigid abdominal wall might be the most important factor necessitating these manoeuvres summed up in the phrase "rough handling." Speaking of the procedure



in the use of spinal anaesthesia, Mr. Lake said that it was a psychological error to ask the patient whether he could feel anything. The anaesthetist should, without such questioning, be fully appreciative of the patient's feelings. The atmosphere should be one of confidence in the anaesthetic and in its safety. This was best obtained by a matter-of-fact attitude on the part of all concerned rather than by repeated reassurances. One disadvantage of spinal anaesthesia was that it permitted the patient to hear all that was said. The walls of the operating theatre should be placarded with warnings against "careless talk." Freedom of speech was all very well in the Atlantic Charter, but it had no place in spinal anaesthesia. He thought the advantages of high spinal anaesthesia outweighed by far its disadvantages. He had used it for years in gastrectomy and similar operations with increasing satisfaction.

The remainder of the discussion was largely a relation by speakers of the details of their particular methods or their modifications of classic methods. Dr. A. H. L. BAKER spoke of the advantages of regional anaesthesia, especially in the better relaxation obtained as compared with general anaesthesia. Dr. ETHERINGTON WILSON said that spinal anaesthesia took a great deal of "getting used to," and the technique must be controlled. He described his own technique, in which he used spinocaine with better results than with nupercaine. Mr. HAROLD DODD and Dr. H. W. L. DALE mentioned modifications which they employed in their practice. Sir JAMES WALTON commented on the slightness of the reference in the discussion to general and complete anaesthesia.

In a general reply Mr. NORMAN LAKE said that on listening to the various speakers he could not help drawing an analogy with our bombing policy in the war. When we wanted to destroy railways in Germany we did not send out individual bombers to cut up a little bit of line here and a little bit of line there, but we sent, in the aggregate, a smaller number of bombers to pinpoint some notorious place such as a marshalling yard. Regional, splanchnic, and local anaesthesia represented a distribution of forces in order to reach the individual railway lines: but with spinal anaesthesia one was actually "bombing the marshalling yards at Hamm."

## PHILOSOPHY OF THE PECKHAM EXPERIMENT

The philosophical basis of the Pioneer Health Centre at Peckham was discussed in a lecture to the Science (Research) Society, a body of young biologists, by Dr. INNES H. PEARSE, one of the medical directors of the Centre.

Dr. Pearse began by pointing out that in the physical or chemical analysis of an organism, which involved the separation of its elements, some quality which she called "liveness" escaped. The pieces of Humpty Dumpty could never really be put together again. The study of the living organism of society demanded a different type of procedure, a creative synthesis, not the cracking of the shell of the egg but the getting of a hen to sit upon it. She mentioned the inseparability of the organism and the environment. All increase in the organism might be said to take place by engulfment of the environment; and once engulfed, a mutual synthesis took place, a shuttle-like process, between the organism and the environment. It was within the range of probability that what was being studied was in fact a mutual evolution of organism and of environment—an environment which was as organismal as the organism itself.

Those who undertook a biological experiment had first to decide what unit to adopt, whether the simplest of organisms—the amoeba—or man; and the Peckham experimenters chose man, for it was the function of the organism they desired to study, and man had the greatest differentiation of function. But they did not take the individual as the basis of observation, they took the mated pair, reaching full maturity in parenthood. Dr. Pearse suggested that in parenthood there was a new creative synthesis, not only in the physical realm but in the whole realm of function which was touched by man and woman. She instanced the parallel of the pair of eyes, each eye in a sense complete and functioning by itself, but having some added aptitude—namely, stereoscopic vision—when functioning as a pair. Something of that kind, she said, might represent the fundamental significance of sex. With this hypothesis, the family—i.e., the mated pair, with or without children

—was chosen at Peckham as the unit for observation of the inherent design in the growth and development of the social organism. The selected environment, for various reasons, could not be the homes or the workplaces, and so the field of leisure was taken, but leisure into which was introduced the greatest diversity of interest and activity, and which brought together people of all ages and of every type of culture and skill. A fairly good cross-section of a suburban community was obtained, and into the midst of this, without disturbance, the observer and his instruments were introduced. A system of periodic health overhauls and family consultations was inaugurated. It was not medical advice which was tendered at such consultations, it was simply a statement of the facts relating to the children and to the parents themselves which had been elicited during the overhau. During the four years of the experiment Dr. Pearse had not heard of one family who, within three months of the consultation, had not in some way acted rationally on what they had been told and had put it right. She described how the subject of pregnancy was approached, and an endeavour made to build up the woman's reserves. The result was that during pregnancy there developed among the Peckham Centre mothers an increase of maturity—a kind of "bloom"—which was quite outside any previous experience of her own in a long medical career. These mothers were in the swimming bath a fortnight before their confinement, they were engaged in the activities of the Centre three hours before they went to hospital, they led a more active life during their pregnancy than at any other time, and from the way in which they carried themselves the casual observer would never have noticed that they were pregnant. Dr. Pearse also described the way in which the "man friend" or "woman friend" of a member of the family was introduced into the Centre, and, as marriage was approached, the procedure of health overhaul and consultation extended to him or her also. The observers further looked for the integration and co-ordination of the families of the Centre with one another so as to form a living society in which all shared. Unhappily, war has interrupted this experiment as so many others.

A joint meeting of the Ulster Medical Society and the Northern Ireland Branch of the B.M.A. was held on Feb. 17 in the Whitha Medical Institute, Belfast, when Lieut.-Col. Ian Fraser spoke on penicillin on the war front. After giving the history of bacteriostatic drugs from 1850 to 1943 he outlined the progress of research on penicillin from Fleming's discovery in 1929. In recording the properties of the drug, he mentioned the trouble produced by it in laboratories, its bad effects on fruits, and its use in the manufacture of valuable by-products. There were 600 varieties of the genus *Penicillium*, the best-known being *glaucum*, *rubrum*, *patulinum*, and *notatum*. Different media were used in its production, the penicillin appearing as a felt on the surface of the medium. As it grew only on the surface, a large surface area was required to produce large quantities. The underlying fluid could be aspirated and replaced by fresh media. It was reduced to the form of a yellowish-brown powder. It was used as a calcium or sodium salt, and was destroyed by acids, alkalis, heavy metals, alcohol, oxidizing agents, heat, rectal contents, *B. coli*, and air organisms. It had no ill effects on white blood cells or fibroblasts. The mode of action was unknown. The most sensitive organism was the gonococcus. With small doses organisms could become resistant just as they did to the sulphonamides. Penicillin was used locally as a calcium salt or as a sodium salt parenterally. Col. Fraser then showed a film illustrating its use on the wounded of the Sicilian and Italian campaigns.

## Effects of Inanition and their Treatment

The Scottish Group of the Nutrition Society met recently in Glasgow to discuss science and post-war relief. Dr. H. E. MAGEE, of the Ministry of Health, in a paper on some effects of inanition and their treatment, pointed out that relief parties going to Europe would not be faced with a host of well-defined deficiency conditions to be corrected by appropriate nutrient concentrates and vitamins. A knowledge of the physiological effects of severe malnutrition would be needed, and in many cases care and discretion in the giving of food. Professional fasters who had survived for as long as 50 days on water only showed changes in body weight, B.M.R., temperature,

and blood volume. Animal experiments had shown that the alimentary canal itself was affected; the mucous membrane atrophied, its protective function decreased, toxins were absorbed more readily, while ulcers were apt to form in the large intestine. The people of Europe would be suffering from varying degrees of partial deprivation, anaemia, hunger oedema, and from neurological and gastrointestinal complications. The last was the most serious of all and in advanced cases recovery was rare. The gums were swollen and inflamed as in scurvy, the tongue red and denuded of epithelium, and the teeth decayed. The stomach was dilated and there was a profuse watery diarrhoea with as many as 30 stools a day. Blood protein fell to a very low level. Death was due to severe diarrhoea with cardiac failure. Mild cases responded rapidly to easily digested food, while cases which came between the two extremes required hospital attention with careful feeding and symptomatic treatment. Opium and potassium permanganate were useful for the diarrhoea. The diet should consist of small quantities of food six times a day—milk, gruels, lean meat, very little fat, with pepsin and hydrochloric acid. Intravenous injections of glucose at frequent intervals helped. Good results had been obtained in many serious cases with intravenous administration of protein hydrolysates. The solution consisted of an acid hydrolysate of casein, tryptophane, cystine or methionine and glucose in Ringer's solution. Up to 4,000 c.cm. of this was given 8 hours out of 24; this yielded 80 g. protein and 1,600 calories. The method was at present under further clinical trial.

Dr. Harriette Chick, of the Lister Institute for Preventive Medicine, who described the famine conditions in Vienna after the last war, thought that the problems would be rather different this time. There would be fewer cases of simple vitamin deficiency, but a great deal of general malnutrition.

## Correspondence

### Hygiene, Morale, and Desert Victory

SIR,—As Assistant Director of Hygiene, Eighth Army, during the relevant period I read Lieut.-Col. H. S. Gear's excellent article, "Hygiene Aspects of the El Alamein Victory," and your leading article thereon in the *B.M.J.*, of March 18 with the greatest interest and, with two exceptions in your leading article, with entire agreement.

The first exception taken is to the first sentence of your leading article, "The conditions that obtained in the Western Desert were so local and exceptional that much of the knowledge that can be distilled from the experiences of the Eighth Army therein cannot be applied directly in plans for military enterprises elsewhere." I submit that this is a disastrous viewpoint—a viewpoint that is unfortunately held too generally, with the consequence that many of the valuable lessons learned there are being overlooked. Warfare to-day is a matter of movement, rapid and over long distances, interspersed with long periods of inactivity while stores are being built up and short periods of pitched battles. Events on all fronts bear out this contention. The problems of administration and organization will be the same in any theatre of war. What hygiene or technical considerations that arose in the Western Desert will not arise in other theatres? The gross water shortage and to some extent the desert sore are the only conditions that are localized to that campaign. Every other problem will arise in some degree in other theatres of war, and no other is likely to be so easy to deal with hygienically and to be so generally healthy. What great need therefore is there for us not to forget those lessons we learnt, particularly those in connexion with organization, when fighting in other places where we may meet all the same difficulties plus many more?

Secondly, you say that the Army at El Alamein was "dispirited." They were physically exhausted and perhaps bitterly disappointed, but never dispirited. Dispirited men could never have fought as did those tired troops between the sea and the Qatara depression during the early part of July, 1942. The leadership of the commanders of those days, such as the late "Straffer" Gott and "Dan" Pienaar and many others who are still living, never allowed the troops to become dispirited, and the morale of the Eighth Army during July, 1942, was never higher.—I am, etc.,

R. LEANING,  
Lieut.-Col., R.A.M.C.

Army School of Hygiene, Mytchett.

### The Prisoner-of-War Mentality

SIR,—I was greatly interested in Major P. H. Newman's article (Jan. 1) and feel that he has done the prisoners a service. I hope that interest in the prisoners of war will be sustained throughout the post-war years, and that this time some sympathetic action will be taken. The cause of the prisoner will need the powerful advocacy of Press and people, and the *B.M.J.* could play a leading part.

Major Newman discusses the officer prisoner. The large majority of our prisoners are N.C.O.s and men, and the conditions will be sharply different from that experienced by officers. I feel that Major Newman is too optimistic about early recovery. I agree with Dr. B. R. Billings (Jan. 15) that the very large majority of our returned prisoners of war will be problems for their lifetime. The men on return will find the war over and be bewildered and hurt by public reaction and indifference. They should not be demobilized but offered a period of reasonable financial security. The alternative of attempting to assess disability and granting a pension will have to be considered.

The establishment of prisoner-of-war clubs is likely, in my opinion, to retard rehabilitation. The returned prisoner should be encouraged to mix with others who have not suffered similar experiences and to merge as soon as possible into normal service or civil society. I hope Major Newman will continue with his most excellent work, and trust that the question of the prisoner of war and his future care will be kept constantly in mind.—I am, etc.,

India,

JOHN HARKNESS.

### Health and Nutrition

SIR,—What's in a name? A name is a direction: a misnomer is a misdirection. Is "health centre" a misnomer? "Health" means whole (A.S. *heilō* = "health," from *hāl*, whole: M.E. *hole*). A mental deficient is not whole. A thyroid-short person is not whole. A malnourished child wants something and is not whole. Food of the needed quality is the major factor in building up a wholesome people. Patients only come to us for their defects and deficiencies to be recognized and remedied. "Thou canst make me whole" was the cry that met the Healer. (A.S. *hēlan*, to "make whole," = "to heal," is from the same word *hāl*, "whole.") The centre the White Paper sketches is a communal surgery, nothing more: a place for the work of healing.

But we are told our service is to be "directed towards the achievement of positive health" (Medical Planning Commission). That is to be our first and principal objective; and indeed it is the only aim of a true national health service. What means are we to use? The documents, White Paper and all, are silent. The means, however, will, upon reflection, be seen to be nine-tenths nutritional. To engender a people sound and complete in every attribute, with dynamic vigour, in very truth with positive health, the means is a sound nutrition, the yield of a fertile soil, the yield of the sea—which is always fertile—those, or the first at least, are prerequisites.

One paragraph in the White Paper (p. 8) states the problem with a candour which, in view of the complete failure of the document to attempt a solution, is astonishing.

"Much of present custom and habit still centres on the idea that the doctor and the hospital and the clinic are the means of mending ill-health rather than of increasing good health and the sense of well-being . . . the plain fact remains that there are many men, women and children who could be and ought to be enjoying sense of health and physical well-being which they do not in fact enjoy. . . . These deficiencies . . . a comprehensive service should seek to make good."

That is the paragraph.

The seeker (the comprehensive service of doctors, hospital and clinical facilities, all for remedial medicine) will never "make good these deficiencies." The service may provide a surgeon to remove a toxic goitre; but to prevent it is beyond the scope. The comprehensive medical services cannot wash the banks of estuaries with iodine-containing mud, they cannot carry inland seaweed by the 100 tons. A Nutrition Minister, Col. Llewellyn, perhaps, if he could engulf Mr. Willink and Mr. Hudson with the powers of Agriculture and Forestry, could make a real impression on the great nutrition problems.

Our people are grand material. A plentiful poor-quality dietary stultifies them. Aware that something is missing, they know not what, they may be discontent. Strikes often mean unrecognized dietary deficiencies. But the ethnic threads woven into the texture of our folk are of high quality. They were tested by invasion, by battle; and two or three thousand years have not weakened the germ plasma. What of the other factor? The cattle-breeder's jest, "Half the pedigree goes in at the mouth," speaks a true thing. The show-ring awards go to the well bred that are well fed. Our people are well bred. The germ plasma is all right. Not so their nutrition. A primary quality in feeding stuffs is freshness. "Alive or nearly alive" is the motto. Apply that to our tables and the gulf between what should be and what is appears. The industrial revolution has cast its blight on the farms; and the food which was used fresh in the old static days now in this age of transport in *excelsis* reaches us from afar, processed in factories or frozen in the Antipodes or autoclaved and tinned or fragmented in the mill, so that we get the shot of the food cartridge without the powder, treated in a thousand ways with skill and chemical mastery; but dead.

Yes, the title of the White Paper, "A National Health Service," is a misnomer and a misdirection. So is the expression "health centre." Healing, not health, is what they deal with. For that purpose we can claim that the doctor's work under the N.H.I. has, to a point, succeeded. To the "cure of sickness" the lowered death rate speaks. It is common ground that that medical work should be extended to the mothers and children. It is common ground that better access to the special departments of treatment is needed. I question whether the machinery of the White Paper and of Sir William Beveridge's report is necessary—except to safeguard the finance of the scheme, which seems the overt reason for the medical section of his proposals (Sect. 437 of Sir William Beveridge's report, last 3 lines). All-beneficent extension of the Act could have been made without this shattering disruption of our age-old profession. Extension is desirable, indeed necessary; but it will not create health. Positive health does not need doctoring: "They that are whole need not a physician"; it is nine-tenths a matter of nutrition, and to be engendered by the fresh product of sea and soil. When Health, Food, and Agriculture and Fisheries are bracketed, so as to minister to the nutrition of our people, we shall have a National Health Service worthy the name.—I am, etc.,

Holmes Chapel.

LIONEL JAS. PICTON.

### The Effects of Cold

SIR,—If you can spare me a little of your restricted space I should like to try to clear up a misunderstanding which I think I detect in Dr. Raymond Greene's letter of April 1 (p. 466).

I hope I have not stressed solidification as a necessary cause of immediate death of tissues when exposed to cold, for, as we all know, the skin can be solidified by the ethyl chloride spray for a very short period without necrosis ensuing. A slight prolongation of the exposure, however, produces subsequent sloughing. Yet individual cells *in vitro* always die when their cytoplasm is solidified, and so the evidence leads to a dilemma. It must be recognized, however, that a whole tissue in the body is composed of more than cytoplasm; there are, for instance, the tissue (intercellular) fluids, which may freeze without the cells themselves being solidified; in other tissues—e.g., bones, tendons, skin, etc.—the main mass is composed of material which is the product of cellular activity, the cells constituting but a small part of the total. This is particularly so in the case of the tails of such animals as rats and mice, which are often used experimentally. Solidification of a tissue, therefore, does not of necessity mean that the cytoplasm of the contained cells has been frozen: indeed the invariable display of supercooling in cytoplasm introduces a time factor which saves the cells in short exposures; hence the common experience with ethyl chloride.

Possibly the pathology of the cryopathies is best considered on a cellular rather than a tissue basis. In this sense I still think that there is a critical temperature (about  $-5^{\circ}\text{C}.$ ) below which immediate cellular death occurs, this being the basic

pathology of true frost-bite; while above this temperature the individual cells are very little affected and the subsequent changes (gaogrene, etc.) are secondary to reactive vascular and other phenomena, this being the essential pathology of trench foot, immersion foot, and similar conditions. Naturally in severe exposures both states will be present, since the temperature fall must vary, depending upon the depth of the tissue from the surface (temperature gradient); the clinical picture is thus rendered obscure by this superimposition of pathologies, and it is unwise to draw deductions therefrom.

The distinction between the two conditions is of much more than academic interest, for if the cells are destroyed during the exposure there is no hope of saving the part, whereas when the cells are alive there is hope that some treatment may be devised which will prevent their subsequent death from secondary causes.—I am, etc.,

London, W.1.

NORMAN C. LAKE.

### Epidemic Jaundice

SIR,—I have noticed for some considerable time reports in the *Journal* of an epidemic, or series of epidemics, of infectious jaundice which have appeared in various parts of England. It is of interest to me because for some months there has been an epidemic in my district in South-Western New South Wales. There may have been a wider distribution, but I cannot say with certainty.

I have noticed on one or two other occasions that we have had epidemics here, almost coincident with similar epidemics abroad, which cannot be explained merely on a basis of contact. I refer particularly to the 1937-9 epidemic of poliomyelitis: I believe that about then there were also epidemics in England, Germany, and the U.S.A. One is reminded of the theory that there is a periodic increase in the virulence of micro-organisms which is almost world-wide.

Clinically the cases are mild, both children and adults being affected. There appear to be a large number of cases which are so mild as to escape medical attention. The symptoms and onset are similar to those described in the *Journal*. I have been struck by the hunger which occurs as soon as the more acute symptoms pass off. So far as physical signs go, they are also similar to those reported but rather milder. Liver tenderness seems very common. The incubation period is hard to investigate, but one gets the impression that it varies from at least three weeks to a longer period. The epidemic has now been in progress since autumn last, or nearly a year.

This is a part of the State where medical practice embraces large farming areas. Sporadic cases are occurring in both small towns and farms remote from towns.

There have been no serious cases and no complications.—I am, etc.,

Ardlethan, New South Wales.

R. A. MCGREGOR.

### Toxic Effects of Sulphaguanidine

SIR,—In an article by Dr. H. G. Smith in the *Journal* of Feb. 26 the effects of sulphaguanidine on the skin are stressed, and in a letter published on March 11 Dr. J. H. S. Whyte draws attention to what he considers to be renal damage after treatment of dysentery with this drug. As neither skin rashes nor renal complications are commonly described by those who have had extensive experience of the drug in countries where dysentery is a serious problem, I feel it necessary to allay the fears of doctors who might be deterred from using sulphaguanidine in their occasional dysentery cases. It would be regrettable if patients were to be deprived of the use of a specific drug, or if the dosage were to be reduced below what is usually recommended—underdosage gives bad results.

In a hospital in the Middle East my colleagues and I had very considerable experience of this drug; we worked under conditions which would increase the risk of renal complications, and certainly would not diminish the effects on the skin. Yet "of the 323 cases treated with sulphaguanidine, often with very large doses up to 350 g., very few examples of toxicity have been found; the drug does not upset the patient any more than does kaolin: in four cases there have been rubelliform rashes about the tenth day, and there has been only one serious complication, a 'sulphaguanidine kidney,' which cleared up rapidly after the intravenous administration

of 2 pints of 4.285% sodium sulphate" (Bulmer, E., and Priest, W. M., *Lancet*, July 17, 1943, p. 69). The average dose was 100 g., and this was often greatly exceeded. I think an explanation must be sought for Dr. Smith's very high incidence of skin rashes (21 out of 44 patients); there may have been some variation in the sample of the drug he used, but he has certainly had an experience with which I am unfamiliar. Even if skin rashes were common, it is very doubtful whether they would matter.

Dr. Whyte's letter raises another hare: he suggests daily urinary examinations for crystals and red blood cells during treatment with this drug because he found them to be present in 14 out of 25 patients whom he treated with quite small doses—51 g. "Sulphaguanidine kidney," the only serious renal complication, is almost unknown, and mine was, so far as I know, the only one reported in the Middle East. Crystals may indeed be found in the urine, and sometimes acetylated compounds of sulphaguanidine will occur, but less frequently than with the other sulphonamide drugs; the presence of a few red blood cells is not unusual in the urines of healthy people.

May I, therefore, register my plea that sulphaguanidine be used in dysentery in full doses, without raising bogies about renal damage or skin rashes?—I am, etc.,

ERNEST BULMER,  
Brigadier.

### Cause of Silicosis

SIR,—Mr. Blacktin's letter in your issue of April 1 invites criticism, if only because the unsolved problem of the true cause of silicosis is so serious that misleading comment on it is to be deplored; and I fear that his remarks are of this kind.

When first considering the study of the action of dusts on weevils I had some hope that it might throw light on silicosis, partly because silica chanced to be practically the only "inert-dust" insecticide known at that time. The hard facts of experiment soon showed, however, that the two problems had little else in common. It is an accepted fact that in silicosis silica (in some form) is the causative agent. In contrast, any finely divided hard sharp substance can act as an insecticide, including calcined alumina, which is extensively used in the potteries as a safe substitute for silica. Further, dusts act on weevils by breaking down an invisible waxy waterproofing on the insect's shell (which, incidentally, is rigid and not subject to movement), causing abnormal water loss and eventual death by desiccation. Assuming that Mr. Blacktin has really read my *Cantor Lectures*, it is a little difficult to follow his reasoning, since there is in fact no shred of evidence that any connexion exists between the causation of silicosis and the action of insecticidal dusts.

Incidentally, I would remark that there is no real reason to suppose that a sharp particle will lacerate a soft surface on which it lies. The best lining in a ball-mill used for grinding hard material is rubber, because it is not abraded even under extreme conditions of movement under pressure.—I am, etc.,

Royal College of Science, London, S.W.7.

H. V. A. BRISCOE.

### Electrocution: Revival by Rocking

SIR,—This case will interest specially the many doctors who teach resuscitation to their first-aid classes.

A youth was electrocuted at his work, respiration ceased entirely, he was pulseless, livid, ears very blue. Div. Supt. F. Dowell promptly performed Schafer's method for 10 minutes without response. By that time Amb. Officer C. B. Cole and Sergt. W. S. Hill had extemporized for the stretcher a fulcrum of concrete blocks 3 feet high, on which Eve's rocking method was performed a dozen times a minute through an angle of 45 degrees each way. (This angle was verified and obtained with the handles conveniently a foot from the ground.) After 20 minutes of rocking, respiration was completely restored.

To save time the wrists and ankles were not bound to the stretcher handles. This was found unnecessary as it was an A.R.P. stretcher of which the wire mesh had bulged from use. The patient did not slip or need support. Blankets had been placed above and below, as in A.R.P. handbook No. 10.

Respiration again failed in the ambulance on the way to the hospital, but soon responded to Schafer's method, and recovery was complete.

Supt. Dowell has supplied me with the above careful details of this fine piece of first-aid work at Leicester recently. He adds:

"The rocking method certainly ventilated the lungs better than Schafer's method, and we are all convinced that rocking saved this youth's life. All the members of this Division have previously been rocked and agree that it makes you inhale and exhale better than Schafer's method."

This case also provides a complete answer to the criticism of Dr. Lloyd Davies's letter in the *Journal* of Jan. 29. He is a firm believer in the rocking method provided the patient is fastened by straps above the shoulders and under the perineum. But his electrocuted girl was so limp that he maintains she would—if fastened only by wrists and ankles to the stretcher-handles—have been shot off the canvas stretcher when tilted at 45 degrees, with peril of fractures of neck or limbs.

The method I prefer is to start Schafer's (or Silvester's) method at once on the ground (blanketed). The stretcher and trestle are brought to him there, he is rolled on to the stretcher and Schafer's method continued while the ankles and wrists are quickly bandaged to the handles. Then, without fumbling, the stretcher is placed on the trestle and rocking started by a full head-down tilt of 45 degrees. The feet-down tilt is not started until fluid from the lungs or stomach has ceased to flow. Rocking is continued at 10 double-rocks a minute—i.e., 4 seconds head down, 2 seconds feet down. Warmth is essential.—I am, etc.,

Holt.

F. C. EVE, M.D., F.R.C.P.

### Chronic Pulmonary Catarrh in Childhood

SIR,—Many readers of Dr. A. Bryan Taylor's thoughtful paper upon this subject (April 1, p. 453) will feel indebted to him for focusing their attention on an important and somewhat neglected problem in children's medicine. Repeated respiratory infection is common among children in ordinary practice, and, of course, very many examples are seen in an out-patient department. Some of these patients are "wheezy" in the attacks and may be sent up by their doctors because asthma is suspected. Infection certainly plays a large part in many cases of asthma, but all that wheezes is not asthma, and differentiation is no simple matter. Dr. Taylor would have us follow the example of Leys, who used the label "chronic pulmonary catarrh"; this surely is a term to be avoided, for, like "chronic bronchitis," it is by no means precise and apt to be loosely applied. Moreover, "chronic pulmonary catarrh" does not describe these cases really well, because they usually suffer from repeated respiratory infection, the brunt of which falls on the upper respiratory tract, seldom so much affecting the alveoli of the lung, except when the pneumococcus or some pneumonia-producing virus is responsible.

Certainly we should avoid any label tending to discourage the search for underlying causes. We need to elucidate the background of the so-called chronic bronchitis or pulmonary catarrh, so that treatment can be planned on a rational basis, and a broad consideration of the factors governing both infection and the patient's resistance is the only proper way of ascertaining the causes of these repeated respiratory attacks.

**Infection.**—The reason for the recurring infections may be discovered on entering the home. Perhaps the most elementary rules of ventilation are being ignored, or no harm seen in the presence of somebody with an acute respiratory infection in a room crowded with children. In a recent patient of mine the school-room was overcrowded and badly ventilated, so that the children were always getting colds.

**Resistance.**—When we turn to questions of resistance we are so in deep water through lack of accurate knowledge. Probably there is a group in which defective diet is important (too much carbohydrate or too little of protective foods). Age and constitutional or inherited factors, as well as hygienic ones such as fresh air and clothing, also play a part which is somewhat undetermined.

Experience shows that a large proportion of these patients have nasopharyngeal abnormalities: there are, for example, the children who are seldom free from nasal discharge from October to March, indicating recurrent or persistent sinusitis; and sometimes there is disease of the tonsils, or perhaps they or the adenoids have been

unskillfully removed, for this is one of the worst-performed operations in surgery.

As Dr. Taylor rightly says, allergic asthma as well as local disease in the lungs has to be excluded, and his emphasis on the need to remedy faulty breathing is also welcome, but his paper does not sufficiently emphasize that treatment depends on accurate diagnosis. It is true that a change of climate may check the sequence of repeated respiratory infections, but most of these children need to be helped without taking them from their homes, and we should first discover what is the matter with them. Clinical and social medicine should here co-operate in diagnosis and treatment, which implies team work between physician, radiologist, nose-and-throat surgeon, physiotherapist, and health visitor.—I am, etc.,

London, W.1.

REGINALD LIGHTWOOD.

SIR,—I have read this article by Dr. Brian Taylor (*Journal*, April 1, p. 453) with great interest, but would beg to disagree with some of his statements: first, that when "recurrent colds and upper respiratory catarrhs were followed by generalized pulmonary effects—coughing, tight chest, wheeziness, and more or less 'asthma'"—they have no true allergic basis; secondly, that "textbooks and the like do not appear to recognize this common and troublesome condition"; and, thirdly, that "skin-testing may show sensitivity to proteins, but these are usually so varied as to make the knowledge of little value."

In many discussions and writings on asthma in childhood (e.g., Garrod, Batten, Thursfield, and Paterson, *Diseases of Children*, 1934, 3rd edition) I have described this "lung damage type," classifying it as such in order to stress the role of upper and lower respiratory infections and the pulmonary complications of the infectious fevers in childhood in the precipitation of the initial wheezy attack, and the part of each subsequent infection in causing a recurrence of the cough, tightness, or wheeziness. A vicious circle seems to be present: the body appears to have very little resistance to even low-grade infections, and if the mucous membranes are constantly irritated by some air-borne allergen an oedematous state is maintained to produce a more fertile field for the growth of any roving bacteria. On the germs taking up their residence the catarrhal symptoms increase, the child is put to bed, propped up with ample pillows, kept in an under-ventilated and over-heated room, and its digestion overtaxed with milk, sops, and cereals. Obviously the difficult breathing that ensues is an allergic manifestation, and surely the knowledge of skin tests which showed a sensitivity to certain proteins—usually feathers, down, horsehair, dust, milk, or cereals—is now of great value in therapeutics. During the infection the body's general resistance is lowered, and the available protective adrenaline production is reduced or used up more quickly; contact with the irritant bedding is increased from 10 hours to 24 hours a day; the dust content of the room is increased by rendering ventilation inadequate in attempts to avoid draughts; the temperature of the room is increased so that the natural evaporation of moisture from the mucous membranes is impeded and their swelling and clogging augmented. In fact, the child is saturated to excess with various potent allergens when resistance is at its lowest ebb.

The deleterious effect of air-raised shelters on these children is the result of adrenaline exhaustion consequent on prolonged fear; greater liability to infection from chilling, overcrowding, and the lack of ventilation and the disinfectant action of any sun's rays; and the greater concentration of allergens—dusts, moulds, eiderdowns, pillows, rugs, and even animals in a very confined space.

Surely the tightness of the chest, cough, or wheeziness in such cases is just as much allergic in origin as the aggravation of an infantile eczema by administering egg-white or fish? If the usual irritants are avoided in these cases of "chronic pulmonary catarrh" constantly—the bedding freed from all feathers, down, horsehair, and dusty substances; the bedroom maintained with a minimum of ledges, curtains, carpets, or other dust-holding surfaces; and the forcing of large quantities of milk and cereal foods is forbidden, especially during infections—the agreed very beneficial effects of changes of climate, breathing exercises, and general hygiene can be greatly augmented and any neuropathic tendency discountenanced.

Dr. Taylor seems to suggest that the criteria of a true allergic asthma are the previous occurrence of infantile eczema, a direct relation between the attacks and foreign proteins, freedom from respiratory symptoms and signs between attacks, and a greater frequency of symptoms in the summer months. In my experience only one child asthmatic in three has had infantile eczema; as severe asthmatic attacks can be produced by aspirin as by any foreign protein; the majority of asthmatics have a blocked or runny nose even between attacks; and with the exception of pollen-sensitive cases most asthmatics are worse in the winter.

Finally, most of the cases described will respond to adrenaline if, first, it is adequately given—small doses being frequently repeated at short intervals and the injections continued for hours after the apparent lessening of the spasm—and, secondly, the sensitizing substances have also been thoroughly removed—the irritant bedding changed and over-alimentation avoided, however "valueless" the skin reactions may have appeared in the free interval.—I am, etc.,

London, W.1.

GEORGE BRAY.

### Pregnancy and Pulmonary Tuberculosis

SIR.—There appears to be something connected with the mysteries of childbirth in the tuberculous woman which, according to Dr. Logg (April 1, p. 468) and Dr. McDade (Jan. 15, p. 97), renders one particularly liable to censure by presenting conclusions which conflict with prevailing opinion. It appears that I have even gone so far as to formulate conclusions contrary to those reached by a B.M.A. conference which sat at Oxford in 1936. May I, through your columns, respectfully remind these gentlemen that we are members of a scientific profession, and deductions based on research should not be influenced by the opinion of others, however eminent the individual or august the gathering. The Black Notley cases have all been treated by myself, or under my supervision, and I maintain that, based on these, my conclusions are logical ones and are definitely not precluded by Dr. Logg's rather dogmatic statements, for which he produces no evidence other than expressions of opinion.

Dr. Logg states that my deductions are not supported by "latest work elsewhere," but he gives no references. I do not know of any comparable recent work, but Jameson at Saranac Lake Sanatorium (*Gynecological and Obstetrical Tuberculosis*, Montreal, 1935, p. 134) reported similar good results in 1935. I am not familiar with the facilities in London for the care of pregnant tuberculous women, but so far as I am aware Black Notley is the only sanatorium in this country which provides the special facilities described in my paper. In this respect at least Dr. Logg must grant London's inferiority to Essex. With reference to Dr. Logg's six "prominent facts," I would like to say:

1. While it is true that some tuberculous women date their illness from a confinement, the number of similar cases in which this cannot be shown must be vastly greater. (I have no figures—neither, apparently, has Dr. Logg.)

2. I have not claimed that pregnancy is likely to benefit the lungs of a tuberculous woman, but I am not alone in noting the improvement that does sometimes occur, and we must remember that many factors in the immunology of tuberculosis are still not yet understood. It may be that, as suggested by my colleague Dr. M. C. Wilkinson, the endocrinal changes which take place in pregnancy have an influence on tuberculosis.

3. Seventy out of 75 quiescent and arrested cases passing through pregnancy and labour without harm is more than a "proportion," and even Dr. Logg must admit this is a significant figure.

4. The usual length of stay after confinement at Black Notley is, for quiescent cases, 1 month under wartime conditions, but was previously 3 months. "Active" cases are retained as long as necessary for treatment. The number of the latter cases was admittedly small (25), but all were under careful observation for periods varying from 2 months to 3 years, and the fact that 18 of them were ultimately discharged either quiescent (8), improved (4), or unchanged (6), does not support Dr. Logg's assertion that "the large majority of active cases tend to deteriorate appreciably during pregnancy or within a few weeks of labour."

5. Combined obstetrical and tuberculosis treatment is precisely what is provided at Black Notley.

6. Reference to my paper (*Journal*, Dec. 18, 1943) will show that I agree with Dr. Logg in that therapeutic abortion is indicated in some cases, and possibly more frequently so when the facilities I



described are not available; but I had hoped that the article, incomplete though it was owing to space restrictions, would have at least suggested that many pregnancies in tuberculous women are unnecessarily terminated.

I feel that it is very seldom safe to be dogmatic in dealing with tuberculosis, and while presenting this letter to refute Dr. Logg's accusation of "precipitate deductions," venture to commend "cautious comment" to him in subjects where much research still remains to be done.—I am, etc.,

Brintree.

R. C. COHEN.

### Anaesthetics, Old and New

SIR,—Recent publications in the *Journal* tend to revive the impression that all is not yet well in the world of anaesthesia. May I, who have been a teacher of anaesthetics for over thirty years, be permitted to express my views on this subject.

Dr. Spoor (March 11, p. 374) writes: "The G.P. uses chloroform and will continue to use chloroform until something equally powerful, convenient, pleasant, and withal less toxic is discovered." I hope not, and I know that the many students I have taught will not. Dr. Spoor's letter has been ably answered by Dr. Dale (March 25, p. 434), but if Dr. Spoor would like to have further information as to why chloroform is condemned he might be interested to read "The Present Position of Chloroform" (*Lancet*, June 12, 1926). In 1925 it was agreed at a meeting of the Scottish Society of Anaesthetists that "in the light of our knowledge of the properties of chloroform, to proceed to induce full surgical anaesthesia supplied only with the means of administering chloroform is unjustifiable." To-day that opinion holds good.

Dr. Kemp, in his article on the aetiology and treatment of convulsions during anaesthesia (April 1, p. 447), suggests that a convulsion during anaesthesia is due to interference with cell respiration in the brain resulting from a condition of anoxaemia. So far, indeed, it is the only acceptable explanation of this phenomenon. Dr. Kemp, however, fails to explain (1) why there were no recorded cases before 1924, and (2) why cases occur with a certain frequency in the records of some administrators and not at all in those of others. These two facts definitely support the view that recent methods and manner of employing anaesthetics are important factors in causing convulsions.

Open ether is not a very recent method, and, as a matter of fact, is relatively rarely the method employed when ether convulsions occur. In a series of over 20,000 cases of open ether I have not seen a case of ether convulsions. Yet Dr. Kemp states that "prophylactic treatment consists in avoiding open and semi-open administration of ether." What meant by "semi-open" I do not know. Open ether, as I understand it, is a perhalation method with mask and drop-bottle and no limitation of atmospheric air. His first case of convulsions (Case 1, 1924) is reported as occurring during 'anaesthesia with ether vapour, with oxygen and semi-open technique with mask and damp towels.' I could well believe that damp towels, suitably employed, could be depended upon to bring about a condition of anoxaemia and convulsions. His Case 4 (1943) is typical of the complications and risks associated with modern methods: "pentothal-intratracheal nitrous oxide-ether . . . closed filter circuit . . . patient in second plane of third stage of anaesthesia . . . pulse 110, colour dusky." All this for a skin-graft operation requiring a simple gas-oxygen administration, and perfectly illustrating the manner in which the misuse of the modern machine leads to anoxaemia and convulsions.

What exactly is the value to the patient of the technique adopted in the above case? It is a method, too, which corresponds to that employed in many other places—e.g., cranial nerve palsies following general anaesthesia (see Humphrey and McClelland, and Carden, March 4, pp. 315 and 319). Dr. Carden refers to the closed-circuit carbon dioxide absorption technique as being almost a routine practice of most anaesthetists, its outstanding advantage being that a quiet operation field is ensured by the diminished respiratory excursions. This is certainly an indirect advantage to the patient, for the surgeon is able to operate more swiftly and with less trauma. I am not aware of any other advantages to the patient, and have not infrequently observed profuse sweating and con-

sequent dehydration. I look upon the closed circuit as an unfortunate necessity when cyclopropane is indicated as the anaesthetic agent to be employed. One must not forget, too, that surgical shock is associated with a low blood pressure due to a falling-off of the cardiac output. The cardiac output depends upon the venous return, and the venous return is greatly assisted by the respiratory excursions. Sufficiently quiet respirations can be assured by appropriate premedication.

It is very difficult to assess the value to the patient of any particular anaesthetic technique, so much must depend upon the skill and experience of the administrator. A method which saves time and trouble, entertains the administrator, and satisfies the surgeon, may not be the best for the immediate and post-operative welfare of the patient.—I am, etc.,

Dundee.

ARTHUR MILLS.

### Medical Research

SIR,—May I add my voice to that of Mr. Malcolm Donaldson, who in the *Journal* of April 8 makes a plea for medical research as a career, and clamours for better conditions and some encouragement for those who show aptitude and interest and a bent for research work.

Various agencies have been set up in the course of time for the cultivation or encouragement of medical research—academies under Government patronage, learned and professional societies formed by interested individuals, special endowment funds the trustees of which distribute income in the form of subventions, and, finally, research professorships occupied by individuals who enjoy the advantages of university associations while freed from ordinary university routine. The final phase in the development of research was the outright institute for medical research established for the express purpose of expediting the increase of knowledge in the field of medicine.

In the past, as Mr. Donaldson points out, recently qualified men with a bent for research too often had to give up hope of developing it for lack of means of support during an apprenticeship. Later came the epoch when grants were obtainable from various sources, but their acceptance usually implied some obligation to collect observations or experimental results for publication. It is now realized that the time spent on immature effort of this kind can be better applied, and that allowance for an unproductive period may yield far better fruit in the long run.

With this view in mind the Government in 1920 set up under the jurisdiction of the Privy Council the Medical Research Council, through which young research workers are maintained in various laboratories and clinics throughout the United Kingdom. In most places where active investigation is going on the beneficent and intelligent co-operation of the Medical Research Council may be discovered. In addition to its distribution of subventions to research workers in universities, hospitals, and kindred institutions throughout Great Britain, the Council with part of its modest funds runs the National Institute for Medical Research at Hampstead. There are very few medical men who are familiar with the manifold activities of the M.R.C. or with the mechanism and general principles guiding its actions. These are set out at some length in the *Lancet* (Aug. 6, 1938), and anybody interested in medical research should make a point of becoming familiar with the workings of the M.R.C.

The financial side of medical research, however, is unsatisfactory. The annual grant from the State Treasury to the M.R.C. is now £215,000. In addition to its public funds, the Council are in a position to help directly or indirectly by advice in the disposal of private endowments for medical research. These they receive from various sources. At present the State provides but meagre financial support for medical research, and though the country is still conservatively inclined, British medicine is moving towards the larger conception of scientific medicine. Now is the time for the profession to organize and clamour for more money with which to conduct research work. A mere £215,000 is, of course, inadequate, and the Government can afford a much larger sum.—I am, etc.,

G. R. W. N. LUNTZ.

It should be added that it was in 1920 that the Medical Research Council received its present title and constitution. The move to provide public money for research was made in

1911, in Mr. Lloyd George's National Health Insurance Scheme. It was in 1913 that the Medical Research Committee (continued in 1920 as the M.R. Council) was established to administer the funds for medical research provided under the National Health Insurance Act.—Ed. *B.M.J.*

### Babies in Glass Cages

SIR,—I was careful in my previous letter not to express a personal opinion regarding the use of glass cubicles, and merely recorded what I had been told in Vienna, where the idea originated. This was that the idea had been abandoned because it gave poor results owing to the children being lonely. It appears that Dr. Baar wants my opinion, so he shall have it. First, he states that the use of cubicles had been abandoned in Vienna because von Pirquet was dead. Surely this is a fantastic point of view. Has insulin been abandoned since Banting's death? Has the use of the arsenicals been given up since Ehrlich died? If ideas are good they do not die with their originator. Again, he states that "the majority of patients in babies' wards are not yet at a sociable age." My dictionary states that "sociable" means "disposed to associate with others." Are not babies disposed to associate with their mothers and others? Do not young mammals crowd together or press close to their mothers? This is so universal that it might be considered instinctual. Separation must be intolerable to a child—more so than to the adult. It might be said with truth that never again will the child be so sociable as it is in its babyhood. To place it in solitary confinement in a glass cubicle seems contrary to its instinctual reactions and is likely to produce harmful results.—I am, etc.,

London, W.I.

CLIFFORD ALLEN.

### Medical Boarding for the Merchant Navy

SIR,—I have read with complete agreement and much satisfaction the letters on the above subject by Dr. H. M. Royds Jones (Dec. 25, 1943, p. 831) and Dr. E. L. Caldwell Smith (Jan. 15, p. 96).

My own experience of the Merchant Navy is of a mere three years' duration, but in that short time I have found that one rapidly gets to know the more permanent members of one's crew, and even though some are not all their departures from positive health are known and can be dealt with. Such men constitute no problem; but every new man may have a chronic duodenal ulcer or a progressive suppurative otitis media—to quote but two types of recent headache—and in existing circumstances, when a busy "signing-on" day permits of only cursory examination, the condition can and will be discovered only when the sufferer reports sick—after sailing.

Until I read Dr. Caldwell Smith's letter I was not aware that the "Pool" kept medical records of any sort, but in view of this fact I think that the procedure which I have recently adopted in dealing with the genuinely sick men may recommend itself to Dr. Royds Jones and many other ship surgeons who find themselves faced with the same problem.

My procedure is to notify the Pool medical officer by personal letter at the end of each voyage of the names and ratings of all men who in my opinion are unfit for sea—e.g., epileptics, peptic ulcers, etc.—and at the same time to refer them to their own doctors, telling the men of all the steps taken. In this way a man cannot complain of high-handed treatment by the ship surgeon, as he comes into the care of his own doctor; or, if he has no doctor, he can be referred directly to the hospital of his choice for investigation and treatment. Thus, in theory at least, the Pool knows the men who should not be permitted to sign on again without careful overhaul, and as a central organization should be able positively to prevent known unfit cases from going to sea. This scheme will not prevent unfit men getting to sea once, but should prevent recurrences. Without prejudice, I must add that I have never yet received any acknowledgment of my communications from the Pool; so whether they are at all appreciated I do not know.

One man referred in the above way some six months ago recently rejoined my ship a much fitter specimen altogether—he was clinically a duodenal ulcer—and he tells me that

he spent three weeks in hospital, but in confirmation or negation of my diagnosis I have had no word. I am prompted, therefore, to the following plea: that the same procedure be adopted in dealing with ship surgeons' as with G.P.s' cases, and a note of the diagnosis and treatment sent by the hospital or doctor concerned. As such patients may apply for a position in the ship at a later date the information is of great importance. I do not imply that such notes are never sent, but their absence is a noticeable feature. A record card which should accompany each man from ship to ship is a necessity, but in the meantime the suggestions made above may be of some help.

So much for ships carrying a surgeon. But what about the greater number that sail without? Would it be possible for the Pool to supply a questionnaire as to the health of the crew, which would be filled in at the end of each voyage by the surgeon if carried, or by the chief officer (the cargo-ship "surgeon") if not, in which leading questions as to men with symptoms of the commoner incapacitating complaints would provide answers whereby the "Pool" medical officer could investigate more thoroughly any suspicious cases?—I am, etc.,

A. E. K. SALVI,  
Ship Surgeon

### Pavlov's Theories

SIR,—May I comment upon your two recent leading articles dealing with Pavlovian physiology and neurosis—namely, "Pavlovian Physiology and War Neurosis" (*Journal*, Aug. 14, 1943, p. 205) and "Behaviour and Neurosis" (Oct. 16, 1943, p. 487). These articles make the criticism that Pavlov's concepts of cortical function and their application to the problems of human behaviour and neurosis are vitiated by his failure to "think in terms of the meaning of stimuli," in "psychological" as well as "physiological" terms, and describes this failure as unscientific and biased.

If brain be the physical organ of mind, then either psychological and physiological phenomena are related precisely and interdependently or their relationship is non-existent, doubtful, or variable. Physiological experiment and deduction in the first case need take no special separate cognizance of the parallel phenomena of consciousness. In the second place, confusion of psychological concepts, definitions, and phenomena must surely be rigidly avoided. It would seem that it is the attitude of your leading article, and not that adopted by Pavlov which is "hardly in the spirit of science."

The statement that Pavlov refused to admit that the behaviour of experimental animals might be determined largely by physiological needs, aversions, conflicts, or other internal motivations is most misleading. He specifically noted that intrusion of strangers, hunger, satiety, desire for micturition, fear, neurosis, confinement, and external distraction profoundly modified his results, and not the least admirable feature of his work is the technique introduced to cope with these complications. Masserman's experiments are apparently made under less rigid conditions in which "the animal is not placed in complete isolation and isolated from every stimulus but the experimental one." The inference drawn that his experiments and conclusions are therefore more scientifically valid is difficult to follow.

It is stated in reference to the application of Pavlovian principles to social phenomena that "this may be good physiology but as a contribution to the all-round understanding of life this kind of wild analogy is a step backward into the materialistic abyss." If it is good physiology honest men must take that step; if not, then disproof will be on scientific grounds and not upon threats of an abyss or criticism of Pavlov's philosophy of life. Surely at this stage of scientific thought the fear that spiritual or psychological realities may be destroyed by demonstration of physical and chemical mechanisms for vital phenomena can be dismissed as mere vulgar error. One may deny in Pavlov's work the accuracy of his experiments, his scientific probity, the correctness of his generalizations, or their applicability to human affairs. One should, however, demonstrate grounds for so doing. To state that his speculations as to the cortical processes of Christian martyrs reach "the zenith of absurdity" without demonstration of the absurdity of fact or logic involved is simply to

darken wisdom. Scientific criticism must be divorced from confusion of terms, from preconceived dogma, and from emotion. Otherwise it can only mislead, misinform, and delay.

"Love," it is stated, "is more than an appetite, and war neurosis more than a stimulation of the fear reflex." One must assume, then, that either they are voluntary psychological acts or that they are independent of physical, neurological, and hormonal mechanisms. Otherwise it is difficult to see how they are to be distinguished from reflexes except in terms of complexity.—I am, etc.,

Brisbane, Queensland.

HAROLD R. LOVE.

### Shock Treatment of Mental Disorder

SIR,—I think the answer to the editorial question appended to my letter (April 15, p. 537) might be put thus: The psychiatrist does not provide "material cells, tissues, or secretions" with "a sane outlook." But so long as these are sufficiently capable of transmitting to the sufferer's mind the explanations and advice of the psychiatrist the sufferer may be able to appreciate and to some extent overcome the handicap of such of his material cells, tissues, or secretions as are not, for some as yet undiscovered reason, functioning normally. If his material cells, tissues, or secretions are in such a condition that they cannot transmit these explanations and advice, or enable the sufferer's mind to interpret them, the mind remains, of course, inaccessible, but not necessarily—or at any rate probably—in itself diseased.—I am, etc.,

London, E.C.1.

H. H. BASHFORD.

### Service Medicine

SIR,—We feel that the anonymous letter published in your issue of April 1, under the heading of "Service Medicine?" demands a reply, if only to correct the statement that it "so accurately" expresses the views of many serving members of our profession. As members of the staff of two teaching hospitals who have been in one of the Services since the outbreak of the war we feel that we have had exceptional opportunities of seeing "Service medicine" and of comparing it with the conditions of pre-war civilian practice, both hospital and private.

Experience over nearly five years has convinced us that Service patients, whether officers or other ranks, get better medical attention as regards diagnosis, treatment, rehabilitation, and after-care, than do civilians, even in peacetime. Those who, like ourselves, have been in consulting practice are all-too-familiar with the carcinoma of the rectum treated with kaolin for months, or the advanced case of phthisis missed through failure to examine the sputum or x-ray the chest. This type of catastrophe very rarely occurs in the Services.

It is of course true that in the Services fuller and more accurate clinical notes are kept, and that administrative arrangements are such that a full medical history is available whenever a Service patient falls ill. Such a system is essential not only from the point of view of continuity of treatment but safeguards the interests of the patient in connexion with the attributability of his illness and subsequent pension, both of which may depend on accurate records; these incidentally will be of great value at a later date from the point of view of medical statistics and their bearing on public health. In our experience the primary factor which overrides all others is what is best for the individual patient.

As regards equipment, that in the Service hospitals we have visited is as good as in the teaching hospitals and better than in the majority of the voluntary hospitals. No piece of equipment asked for and needed for the good of the patients is refused if justifiable and available. When special treatment, such as deep x-ray, is required for which no Service facilities are available the patient is promptly transferred to an Emergency Medical Service bed where the required services are available. Even in sick quarters the equipment and the supply of drugs are better than most practitioners are likely to carry in their consulting rooms.

Your correspondent complains that he has not enough work to occupy his time. Obviously in any Service in wartime circumstances over which the medical authorities have no control may temporarily increase or diminish the stress of work. It has, however, been our experience that in the rare cases

in which we have heard this complaint from medical officers the officer is either lazy and incompetent or else he is one of those disgruntled persons who is primarily interested in his own comfort and career rather than in his contribution to the war effort. If there is to be a State Medical Service it can only be hoped that your correspondent will see his way to remain out of it.—We are, etc.,

London, W.1.

STANFORD CADE,  
J. J. CONYBEARE.

## Obituary

J. C. DUNLOP, M.D., F.R.C.P.Ed.

We regret to announce that Dr. James Craufurd Dunlop, formerly Registrar-General for Scotland, died at Drumbug, North Berwick, on April 10.

Born on Sept. 3, 1865, the son of a Glasgow merchant, he was educated at Christ's Hospital and the University of Edinburgh, graduating M.B., C.M. in 1887 and proceeding M.D. in 1895; he also took the M.R.C.P.Ed. and M.R.C.S.Eng. diplomas, and was elected a Fellow of the Royal College of Physicians of Edinburgh in 1891, afterwards serving as vice-president. Dr. Dunlop went to Strasburg, Vienna, and Paris for postgraduate study; on his return to Edinburgh he served for five years as an extra physician to the Royal Hospital for Sick Children, and was then appointed medical superintendent of statistics at the Registrar-General's office. In 1914 he went temporarily to the War Office in London as Director of Statistics in the Department of the Surveyor-General of Supply. In 1921 he became Registrar-General for Scotland and was responsible for the Census of that year; he retired from the post in 1931 on reaching the age limit.

James Dunlop was a statistician of international repute; the Faculty of Actuaries of Scotland made him an Honorary Fellow and he was a member of the International Statistical Institute. Unofficially he was responsible for the only two life tables compiled for Scotland—one based on the 1911 Census and the other on the 1921 Census. Among other public services he worked as a member of the Royal Commission on the Care and Control of the Feeble-minded. He had been inspector under the Inebriate (Scotland) Acts, and assisted for some years the medical adviser to the Scottish Prison Commissioners. A keen sportsman and lover of open-air pursuits, he took particular pride in his appointment as a member of the King's Bodyguard for Scotland (the Royal Company of Archers).

R. J. COULTER, F.R.C.S.I., D.O.

We announce with regret the death on Easter Sunday at the Royal Gwent Hospital, Newport, Mon., of Mr. Robert James Coulter, consulting ophthalmic surgeon to that and other hospitals and formerly honorary treasurer of the Oxford Ophthalmological Congress.

He studied medicine at Trinity College, Dublin, graduating B.A. in 1891, M.B., B.Ch., B.A.O. in the following year, and M.A. in 1907; he obtained the F.R.C.S.I. in 1899 and the Oxford Diploma in Ophthalmology in 1911. His first appointments were as house-surgeon at the National Eye and Ear Infirmary, Dublin, and at the Bristol Eye Hospital, and thence forward he devoted himself to ophthalmology, working in South Wales and Monmouthshire on the visiting staff of the Royal Gwent Hospital, the Newport and Pontypool Hospital, the Blaina Hospital, the Woolaston House Infirmary, and the Abertillery and Ebbw Vale Hospitals. He was a member of the Ophthalmological Society of the United Kingdom and of the Société Française d'Ophthalmologie; and among other writings on his specialty he contributed the section on injuries to the eye to W. J. Greer's *Industrial Diseases and Accidents*.

Mr. Coulter had a long record of service in the British Medical Association, which he joined in 1894. He was active in the local work of the Monmouth Division, president of the South Wales and Monmouthshire Branch in 1925-6, and a treasurer from 1933. At headquarters in London he was a member of the Ophthalmic Committee from 1923. At the Annual Meeting of the Association in Birmingham in 1911

he was secretary of the Section of Ophthalmology, and he held office again as vice-president of that section at Bradford in 1924 and at the Edinburgh Meeting in 1928, the year in which he gave the Montgomery Lecture.

#### SIR HENRY MAUDSLEY

Sir THOMAS DUNHILL, who was house-physician to the late Sir Henry Maudsley at the Royal Melbourne Hospital in 1904, sends the following appreciation:

Maudsley was the first to begin the teaching of modern neurology at the Royal Melbourne Hospital. That does not imply any dearth of good—or great—clinical teachers before him, but it is no criticism of those men to say that a patient with disease of the central nervous system received less attention than the condition merited. In the days when those teachers had graduated travel to the home country was not so usual as it became later, and neurology was comparatively young. Maudsley had grown up under the influence of his uncle and namesake who founded the Maudsley Hospital for mental diseases; he had the inquiring mind and he was student and house-physician with Victor Horsley, who for many years to come was working out the centres and tracts of the central nervous system. Maudsley was appointed to the teaching staff of the Royal Melbourne Hospital in 1904; before then he had been, for some years, on the staff of the Alfred Hospital, at that time not a teaching hospital. To him every neurological case was a fascinating problem, a spiritual adventure. One recalls his excited face, the tenseness in his well-groomed erect figure as he approached the patient; his "Now, now, now?" to one and another of his students as he unravelled the symptoms in his orderly way, correlating their knowledge of anatomy and physiology with the clinical picture. We saw the essentials shaping themselves in his mind. We learnt to see, to think, and to integrate as the signs were elicited and the picture built up—all this was new to us, and marked not a renaissance but the birth of neurology in Melbourne. A year or two afterwards the late Richard Stawell, who had been physician to the children's hospital, was appointed to the out-patient department of the Royal Melbourne Hospital. There is no subsequent graduate of this hospital who is not deeply indebted to these two men; each adopted the Socratic method of teaching, and together they started the second era of medicine in Melbourne. After them, succeeding generations of physicians and surgeons have played their part in advances in this department of medicine.

Maudsley was equally able in other branches of medicine. Specialization had not at that time reached the stage it holds to-day. Nor must his personal and human side be passed without some comment. Whenever something new appeared in the medical journals that gave promise of being an important advance, he would seek out a young graduate and say, "You are young, you have the time, you must work this out in the University laboratories, and see if it is true, and if it is of value."

Mr. ARTHUR DOUGLAS COWBURN, M.R.C.S., formerly coroner for South London, who died on March 27, was born at Queensferry in November, 1869, son of Capt. Arthur Cowburn, R.N. From Charterhouse he went to study medicine at St. Thomas's Hospital and qualified in 1897. After being called to the Bar in 1903 and taking the D.P.H., he was for a number of years M.O.H. to the Inner and Middle Temples. In 1912 he became deputy coroner for the Western and several other districts of London. He served in the R.N.V.R. during the last war, mainly at sea, and reached the rank of surgeon captain; after demobilization he became deputy coroner for the North-East London district and in 1924 coroner for the Southern district, from which post he retired in 1939. Cowburn held office as secretary of the Section of State Medicine and Industrial Diseases at the Birmingham Meeting of the B.M.A. in 1911; in 1935 he was elected president of the Coroners' Society; he had also been a member of the council of the Medico-Legal Society for a long period. When he took up his duties as coroner in South-West London he organized in co-operation with King's College Hospital a panel of pathologists to make post-mortem examinations, and he was instrumental in reforming the mortuaries within his district. His kindly consideration for the bereaved was much appreciated by all who attended inquests held by him.

The death of Dr. PERCY JAKINS at the age of 58 has left an honoured memory in the minds of those who can recall him as a member of the active staff of the Royal National Throat, Nose & Ear Hospital, and especially in the minds of those of his surviving colleagues at that hospital, which he served so well and with such complete unselfishness for over 30 years. Jakins came on the staff in 1885 and retired at the age limit shortly after the outbreak of the last war. He remained at his post during the difficult war years until 1918.

His help during that time was invaluable. He was a man of kind and genial temper, simple in manner, and easy of approach. He was very human, and his lively sense of humour endeared him to all with whom he came into contact, whatever their rank in life. He took a particularly close interest in the welfare of the nursing and other staff of the hospital, and they all had a warm affection for him. In his professional work Jakins was of a sound sense and excellent judgment. Trained as a physician, he had, in the main, the physician's outlook, but became a deft, confident, and successful operator, especially in the surgery of the temporal bone. He never attempted too much. He knew what he could not do, but he knew with equal clearness what he *could* do, and that he did right well. Little influenced by new theory or by the bright promise of novel ideas, his eyes, in the field of surgery, were not out upon the horizon, but committed to here and now. For him was no "brave music of a distant drum." His patients were sincerely attached to him, and for a man to be held in such affectionate regard by such large numbers is no mean tribute; this tribute Jakins indeed had in overflowing measure. With him passes one of the pioneers of otology and laryngology and one of those early workers who helped to found the name and repute of the Royal National Throat, Nose & Ear Hospital.—A. R.

Dr. NORMAN MACNAIR died on April 5 after a long and painful illness, borne with much fortitude and courage. He had a serious heart attack about seven years ago, followed soon after by a cerebral embolism, which curtailed his mental activities and made him almost totally bed-ridden. Dr. Macnair was educated at the Glasgow Academy and the University of Glasgow, afterwards continuing his education as a postgraduate in Vienna. He was a distinguished student, and at an early age obtained many degrees and diplomas, which were to assist him in his work as a practitioner in the West End of Glasgow. He took the B.Sc. of Glasgow University in 1894, M.B., C.M. (with commendation) 1897, M.D. 1899, M.R.C.S., L.R.C.P. London 1897, F.R.F.P.S.G. in 1902. He was house-physician, and afterwards assistant physician, in the Royal Infirmary, where he was closely associated with his teacher Dr. George S. Middleton, for whom he had the greatest respect. He was for a time assistant surgeon to the Glasgow Ear Hospital, where he learned much that proved of great value to him in his practice. He was also house-physician and assistant physician to the Royal Hospital for Sick Children—a position which he almost cherished most, as it brought him in contact with children, to whom he was devoted. With all this experience and preparation, it was not surprising that when he started in general practice he very soon had a large number of patients. As his practice grew, he became associated with the late Dr. Berkeley Robertson, who died a few years ago. His success, however, depended greatly on the man himself. He had a retiring and gentle disposition, and was at his best with his patients and with his medical friends. He avoided publicity, and took little part in public affairs and medical politics. In his earlier years he was a keen golfer and played a good game, but in his latter years, owing to ill-health, he interested himself in gardening. He built a small bungalow on the top of a hill among the green-topped hills of Lanarkshire, and for many years spent almost every week-end in his delightful home, with a garden full of alpine plants and heather. For the last few years after his enforced retirement he has lived there completely, enjoying as much as possible the secrets of Nature. He was fond of music, playing the violin at one time, but mostly devoting himself to singing. He had a beautiful clear soft tenor voice that gave great pleasure to his many friends at home and at medical dinners. He was a gentleman to the backbone, and his loss will be greatly deplored by all who knew him. Our sincere sympathy goes out to his wife, who helped to nurse him during these last seven trying years.—J. S. McK.

Dr. JAMES ROBERT NICOLL died on Oct. 24, 1943, at his residence, Toowoomba, Queensland, at the age of 85. He was born at Rhynie, Aberdeenshire, where the Nicoll Hospital has been erected in memory of his parents, the Rev. Alexander and Mrs. Nicoll. He was educated at Rhynie and Aberdeen Grammar School and graduated M.A. in 1878, M.B., Ch.M. in 1882 at the University of Aberdeen. In the following year he went to Queensland, where he held posts as health inspector at Brisbane and Mackay and as assistant medical superintendent at Goodua Mental Hospital, and in 1897 became medical superintendent at the Willowburn Mental Hospital. His work there during 30 years became well and favourably known throughout Queensland. Retiring at the age of 70 he lived at Southport, Brisbane, and later at Toowoomba. He was a generous supporter of all good causes and was held in high esteem. A tribute from a colleague of many years said of him: "Dr. Nicoll will long be remembered with affection by all those who knew him." Inquiries and expressions of sympathy were many,

during his illness, from old hands at Willowburn, both staff and patients. His long years of faithful and humane service endeared him to all who came in contact with him. One envied many of his qualities, his unflinching kindness, equable temper, remarkable memory and all-seeing eye, a physician, a scholar, and a gentleman! Truly one of the "old school."

Dr. W. E. Rutledge writes: It is many years ago that a suggestion was made to the Rev. SAMUEL HANNA that, being interested in theology and medicine, a medical degree was the only solution of his desire to understand more of the workings of the body as well as the soul. I was a medical student then, and made this suggestion. A few weeks later this idea was taken up, and thenceforth the then Presbyterian minister was on his way not only to get new ideas for his sermons but to becoming what he desired above all, a greater influence for good in the world, by being able to work in a dual capacity. After qualifying at Queen's University, Belfast, Hanna practised medicine in his spare time, and continued his work in the Church. Indeed, for a long time there were few churches in the city that could boast of the overflow of congregations eager to hear one of such outstanding personality, who was practising as a doctor and spiritual adviser at the same time. This man of strong opinions and kindness of heart, whom I have known as a personal friend for many years, must have surely been unique in the medical world. One interesting incident in his postgraduate career is worth reporting. While doing a locum for a country doctor, one of his patients died. At the request of the local clergyman he took part in the service at the graveside. Those present at the funeral looked in amazement at a doctor so joining in the service.

## Universities and Colleges

### UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—J. Benn.  
FINAL M.B., Ch.B.—Part II: F. E. Aaron, V. Altman, W. Boyes, Joan S. Brierley, Joyce M. F. Briggs, G. H. Briggs, J. L. Capper, Barbara E. Clapham, H. F. Claye, H. H. Collins, S. Cope, Betty Craig, T. Debnay, J. Exley, G. W. Knight, E. Lyons, R. H. Merrick, Margaret D. Oakley, W. H. Oesterlein, D. E. H. Robertson, N. V. Sapler, Sheila F. Schofield, R. H. Seville, P. M. Smith-Moorhouse, G. A. Stanton, S. B. Tomlinson, E. Wolffenstein, C. J. E. Wright.

### UNIVERSITY OF WALES

#### WELSH NATIONAL SCHOOL OF MEDICINE

The following candidates have satisfied the examiners at the examination indicated:

M.B., B.Ch.—Medicine: I. F. Barwell-Clarke, E. R. Edmunds, A. J. Evans, A. D. Evans, Marguerite J. Hennelly, J. C. Hughes, D. C. W. Jenkins, \*D. I. Jenkins, C. R. Jones, C. C. Lewis, D. A. Macfarlane, Mary W. Owen, Winifred S. Phillips, I. Rees-Mathews, F. W. Richards, E. G. Roberts, T. H. L. Rosser, L. P. Thomas. Pathology and Bacteriology: D. Anthony, W. H. Beasley, B. L. Crystal, L. G. G. Davies, J. H. Edworthy, E. M. L. Evans, Hannah P. Evans, L. A. J. Evans, Myrddin Evans, Joan Guy, J. C. Ham, B. E. Heard, I. D. Jacobs, P. G. Jagger, Jane W. James, W. J. Jenkins, J. G. Jones, D. O. Lewis, D. R. Lewis, W. T. Lloyd, Joy A. Macgregor, \*Gara D. S. Marshall, Isobel F. A. Mitchell, Margaret Owen, D. B. Price, \*A. Reed, E. G. Rees, R. M. E. Seal, D. R. Thomas, D. V. Thomas, \*M. S. Thomas, D. Tooms, L. L. R. White, Cairn M. Williams, D. M. Williams, P. R. J. Williams. Surgery: Joan Collins, D. M. Davies, S. W. V. Davies, T. K. Davies, Eileen J. Evans, H. J. Fisher, J. C. Hughes, R. G. Hughes, D. I. Jenkins, H. O. Jones, Alice M. A. Lee, D. A. Macfarlane, Eury Morgan, Isabella M. Pinkerton, G. D. Powell, D. B. Richards, P. W. Richards, W. Stevenson, Gertrude G. Thomas, L. P. Thomas, Vivien V. Tracey, Mary L. Williams.

\* With distinction.

### UNIVERSITY OF ST. ANDREWS

The following medical degrees were conferred at a graduation ceremony on April 6:

M.D.—Sheila T. E. Callender (with honours for thesis and University Gold Medal). J. Sims.

Ch.M.—H. A. Haxton.

M.B., Ch.B.—Minnie K. Herring, \*L. Frain-Bell, \*S. Bayne, \*H. B. Goodall, \*N. K. Smith, \*Margaret B. Noble, \*J. E. Hilton, \*J. M. Johnstone, \*R. M. Milne, \*Janet E. Beattie, J. M. Anderson, Eilice A. Baird, Jeanne M. Bower, D. M. Caird, J. C. Campbell, Margaret A. Curr, C. Fleming, M. Fletcher, H. G. Ford, J. C. Forfar, I. M. Grant, T. P. Grant, Dorothy A. J. Hamilton, Beryl R. Law, T. R. Macdonald, J. L. Mackenzie, W. J. McLaren, K. Milne, J. T. Paton, Margaret S. Purvis, Patricia J. S. Robertson, Winifred M. Ross, E. H. Russell, A. M. Stalker, J. Stohner, M. D. Thomson, T. P. Venning, A. G. Watson, H. E. R. Wem, Elizabeth R. Younger.

Prizes were awarded as follows:

Low Memorial Prize for the Most Distinguished Graduate: Minnie K. Herring.  
Royde's Memorial Prize in Medicine and Pathology: H. B. Goodall.  
MacEwan Prize in Surgery: I. M. Grant.

\* With distinction. \* With commendation.

### ROYAL COLLEGE OF PHYSICIANS OF LONDON

At the meeting of the Royal College of Physicians of London held on April 3 Lord Moran was re-elected President of the College.

## Medical Notes in Parliament

### Ensuring Cleanliness of School-children

During the Committee stage of the Education Bill in the House of Commons on April 4 Mr. EDE moved a new clause (Power to Ensure Cleanliness). The clause provided that if in the opinion of a medical officer of a local education authority there was reasonable cause to suspect that the person or clothing of a pupil was infested with vermin or in a foul condition, he might cause an examination to be made, and if the person or clothing was found to be so infested, etc., a notice requiring the person and clothing to be cleansed might be served on the parent or pupil. The clause also provided that no girl should be examined or cleansed under the powers conferred by the clause except by a duly qualified medical practitioner or by a woman authorized for that purpose by a local education authority.

The clause was added to the Bill.

### Casualties of British Empire

Mr. CHURCHILL announced on April 4 that during the first four years of war casualties to all ranks of British Empire Forces, excluding deaths from natural causes, were: killed 158,741, wounded 159,219. For the United Kingdom the casualties in the Forces were: killed 120,958, wounded 93,622. Civilian casualties in the United Kingdom during the first four years of war were: killed 49,730, injured and detained in hospital 59,371. These latter figures did not include civilian casualties at sea. Casualties to merchant seamen on British ships during the same four years included 26,317 deaths.

### Smallpox at Mount Vernon Hospital

Mr. VIANT asked on April 5 whether the Secretary for War knew that a soldier who had been successfully vaccinated in infancy and again two years ago introduced smallpox into the Mount Vernon Hospital and spread the infection to 11 other people; and whether, in view of the fact that vaccinated soldiers contracted smallpox during this war, he would either stop all leave of troops to any part of the country where smallpox cases occurred, or make no distinction between vaccinated and unvaccinated men. Sir JAMES GRIGG said he knew that this soldier had been vaccinated successfully in infancy and again in 1942. Owing to the protection thus given him he had a mild attack of smallpox in spite of the fact that the strain was a virulent one. Experience showed that in the interests of the health of the troops it was necessary to maintain the policy he had previously outlined.

### Northern Ireland Parliament

The Government of Northern Ireland has acted promptly on the recommendation of the Select Committee on Health Services by introducing into Parliament a Bill for the setting up of a Ministry of Health and Local Government. The chairman of the committee was Mr. Howard Stevenson, F.R.C.S., who is also one of the Members of Parliament for Queen's University. Moving the second reading of the Bill on April 4 the Prime Minister, Sir BASIL BROOKE, said it gave effect to the main recommendation of the Select Committee on Health Services. The Government were in full agreement with the committee that the time had come to concentrate all these services in one Department under a Minister specially charged with their supervision. He expressed the Government's appreciation of the comprehensive way in which the whole field of health services had been reviewed by the committee. The Prime Minister explained that under Clause 1 of the Bill the proposed Ministry would be responsible for the administration of health, housing, and local government services. The health services could not be divorced from housing conditions.

"We fully recognize," Sir Basil Brooke proceeded, "that the most up-to-date methods for the prevention and cure of illness must be made available to the greatest extent possible for those who require medical attention, and to this end the new Ministry will apply itself. The only method by which the general standard of health can be improved and maintained is by the provision of better housing conditions. These two important matters are closely linked with our system of local government. All these services are interdependent, and the Government consider that the responsibility for health, housing, and local government should rest with one Department. I feel sure that this measure will mark an important stage in our progress towards the creation of better conditions of health and housing and that it will commend itself to the House as a whole."

In the course of the debate Dr. LYLE (Mr. Howard Stevenson's co-member for Queen's University) strongly urged that the new Ministry should include all health services, including health insurance and the inspection and treatment of school-children.





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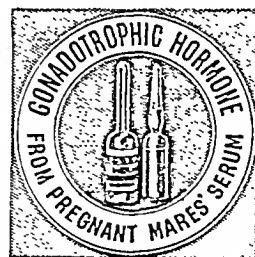
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## The Services

Surg. Lieut.-Cmdr. W. F. Viret, R.N., and Temp. Surg. Lieut. R. Rhydyen, R.N.V.R., have been awarded the D.S.C., and Acting Surg. Lieut.-Cmdr. B. F. Jackson, R.N.V.R., has been mentioned in dispatches. These names appear in a list of awards published by the *London Gazette* for undaunted courage, determination, and endurance in certain of H.M. ships in many sweeps against enemy shipping in the Aegean under fierce and constant attack from the air, and in maintaining supplies to the islands of Kos and Leros until they fell to superior enemy forces.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Capt. W. R. Hart, I.M.S., in recognition of gallant conduct in carrying out hazardous work in a very brave manner.

Capt. (Temp. Major) J. Swinney, R.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

Surg. Lieut.-Cmdrs. J. F. M. Milner and T. Colver, R.N.V.R., have been awarded the R.N.V.R. Officers' Decoration.

### CASUALTIES IN THE MEDICAL SERVICES

*Wounded*.—War Subs. Capt. W. Foster and J. Wilson, R.A.M.C. *Prisoners of war*.—Lieut.-Col. J. W. Craven, M.C., T.D., R.A.M.C.; Temp. Major M. T. Read, M.C., R.A.M.C.; Acting Major V. Bennett, R.A.M.C.; War Subs. Capt. D. F. Rees and W. P. Wallace, R.A.M.C.; Lieuts. W. Donaldson and T. Wilson, R.A.M.C.

*Missing, presumed killed*.—Acting Surg. Lieut.-Cmdr. B. F. Jackson, R.N.V.R.; Temp. Surg. Lieuts. H. C. Llewellyn and J. H. Wainwright, R.N.V.R.

*Killed in action*.—Capt. C. Greenwood-Penny, R.A.M.C. *Died on active service*.—Surg. Lieut. M. J. Hood, R.N.V.R. *Died at a Casualty Reception Station*.—Capt. E. A. Walker, M.C., R.A.M.C.

## Medical News

The second of the film shows arranged by the Leeds Division of the B.M.A. with the co-operation of the Ministry of Information will be given at the Majestic Cinema, Leeds, on Sunday, April 23, at 3 p.m. The programme will include "Of One Blood," "Man Wounded," and "Plastic Surgery" (in technicolour). All doctors in the area are cordially invited.

Lord Moran, P.R.C.P., will speak on "The Future of Medical Education" to the members of the Polish Medical Association and their guests on Tuesday, April 25, at 4.30 p.m. in the Great Hall, B.M.A. House, Tavistock Square, W.C. Dr. George de Swiet (Hon. President) will take the chair. After discussion the vote of thanks will be proposed by Prof. A. Jurasz, F.R.C.S.(Hon.), Dean of the Polish Medical School, Edinburgh. Medical men and women of all nationalities are welcome.

H.R.H. the Duchess of Kent will attend a special meeting of the National Council for Mental Hygiene at Manson House, 26, Portland Place, W., on Wednesday, April 26, at 3.30 p.m., with Lord Alness in the chair. Dr. Helen Boyle will give an address, followed by the showing of a film.

The annual meeting of the Central Council for the Care of Cripples will be held on Thursday, April 27, in the Cowdray Hall, Henrietta Place, London, W.1, at 2.45 p.m., when Col. Rex Diveley, senior consultant orthopaedic surgeon to the United States Army, will speak on "The Care of Cripples in the United States." Tickets of admission may be had from the Secretary, C.C.C.C., 34, Eccleston Square, S.W.1.

Under the auspices of the British Council and the Ministry of Information a film entitled "Surgery in Chest Diseases" was shown in the Great Hall of Queen's University, Belfast, on March 13. The audience was a large one and included, in addition to the local medical fraternity, many American medical officers and senior medical students.

The William Blair Bell Memorial Lecture will be given at the Royal College of Obstetricians and Gynaecologists, 58, Queen Anne Street, London, W.1, on Saturday, April 29, at 3 p.m., by Dr. H. R. MacLennan. His subject is "Contracted Pelvis in Childbirth." Medical practitioners are invited to attend.

Dr. C. H. Best, F.R.S., professor of physiology in the University of Toronto, has been elected a member of the Athenaeum under the rule for special elections.

The Ministry of Labour and National Service, St. James's Square, S.W.1, has issued a leaflet on the training and resettlement of disabled soldiers, with an appendix on training courses in industrial and other occupations. The various facilities now available for disabled persons are briefly described.

At a meeting of the Medical Society for the Study of Venereal Diseases to be held at 11, Chandos Street, Cavendish Square, W., on Saturday, April 29, at 2.30 p.m., Major D. I. Williams, Major C. S. Nicol, and Lieut.-Col. A. J. King, R.A.M.C., will give a review of experience during the past four years in sulphonamide treatment of gonorrhoea in the male. On Saturday, May 20, Prof. A. Fleming will give an address on penicillin.

The Delhi correspondent of the *Times* reports that Prof. A. V. Hill, M.P., Secretary of the Royal Society, who will return to England soon after a stay of five months in India, has spoken to newspaper correspondents about a forthcoming visit of Indian scientists to England. The delegation will include Col. H. L. Batra, deputy director of the Indian Medical Service, Sir S. S. Bhatnagar, F.R.S., director of the Advisory Board of Scientific and Industrial Research, Sir J. C. Ghosh, director of the Indian Institute of Science, Bangalore, and Professors S. K. Mitra and M. M. Sar, of Calcutta.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In England and Wales the notifications for scarlet fever, diphtheria, and dysentery exceeded those of the previous week by 61, 48, and 35 respectively, but those for measles and whooping-cough were lower by 114 and 113.

The returns for diphtheria were the largest for nine weeks, there being a slight rise throughout the country. The local trends of whooping-cough fluctuated, the drop being most pronounced in the south, and the largest rise in Lancashire 36. After mounting continuously for eleven weeks, the incidence of measles fell, particularly in Kent, the Isle of Wight, and London, where notifications were 81, 69, and 63 respectively fewer than in the previous week. In contrast to the general trend, a rise of 157 in the notifications of measles was reported from Lancashire, Liverpool C.B. recording 40 more cases than last week, Manchester C.B. 23, Abertown U.D. 51, and Golborne U.D. 20.

The incidence of dysentery, which has been at a high level this year, rose by 35, and the total—309—is the largest for any week during the past six months. Since the outbreak of war there has been a rise in the endemic level of this disease. It is probable that many cases escape notification, and consequently the amount of ill-health due to dysentery is much larger than the returns indicate. Centres of infection during the week were: London 55 (Lewisham 22); Lancashire 53 (Blackburn R.D. 31); Surrey 41 (Wimbledon M.B. 25); Northants 30 (Kettering M.B. 27); Middlesex 18; Staffordshire 14.

In Scotland notifications of measles showed a rise of 59 over last week's total, diphtheria a rise of 27, cerebrospinal fever of 22, and whooping-cough of 12, but notifications for scarlet fever dropped by 38, and those of dysentery by 33. The only local increases of note were in the City of Glasgow, where measles notifications mounted by 86 cases, and those of cerebrospinal fever by 19. The largest returns for dysentery were: Lanark County 19, Glasgow 18, Edinburgh 14, Dundee 10.

In Eire the notifications of measles were 32 higher than last week, and those of diphtheria were 12. Diphtheria is widespread, involving forty registration districts. Over half of the cases of measles and nearly half of the cases of whooping-cough were notified in Dublin C.B. One case of typhus was notified in Galway, Oughterard R.D.

In Northern Ireland there was little change in the trend of infectious diseases. 43 of the 78 cases of scarlet fever were reported from Belfast C.B.

### Quarterly Returns for Eire

The birth rate during the last quarter of 1943 was 20.7 per 1,000, being 0.6 below the rate for the December quarter of 1942, but 2.2 above the average for the corresponding quarters of 1938-42. Infant mortality was 81 per 1,000 registered births, and was 9 above the average for the five preceding fourth quarters. The general death rate was 14.8 per 1,000, being 1.6 above the five-year average. Deaths from pulmonary tuberculosis numbered 690, and other forms of tuberculosis 178, respectively 65 and 2 fewer than in the preceding fourth quarter, but 68 and 16 above the five-year average.

The summary for the whole of 1943 is included in the report. The birth rate during the year was 22.3, being the same value as recorded in 1942. The infant mortality per 1,000 registered births was 80; during the preceding five years the rate had varied between 66 and 74. A general death rate of 14.7 per 1,000 was recorded, this being 0.6 greater than in the preceding year and than the five-year average. Deaths from pulmonary tuberculosis numbered 3,366, a decrease of 146 from the total of the preceding year but 484 above the average for 1938-42. 854 deaths were attributed to other forms of tuberculosis, an increase of 19 on the preceding year and 85 above the five-year

average. Deaths from the principal infectious diseases were 1,912, an increase of 237 on the preceding year and 596 in excess of the average of 1938-42. Almost two-thirds (1,191) of the deaths in this classification were due to diarrhoea and enteritis under 2 years; the number registered in Dublin C.B. was 609. The number of deaths from whooping-cough was 297 and from diphtheria 309, these being in excess of the average of the five preceding years by 120 and 75 respectively. 28 deaths were attributed to measles; during the five preceding years the deaths had fluctuated between 77 and 102.

#### Week Ending April 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 2,089, whooping-cough 1,558, diphtheria 554, measles 2,343, acute pneumonia 1,003, cerebrospinal fever 78, dysentery 250, smallpox 1, paratyphoid 2, typhoid 9.

#### Where to Treat Scarlet Fever

We have received from Dr. W. A. Bullough, County M.O. for Essex, a memorandum on scarlet fever issued by the Essex Epidemiological Committee for the guidance of practitioners in that county. The memo points out that the mildness of scarlet fever makes the former administrative control largely unnecessary. Scarlet fever is only one of the many manifestations of infection with Group A haemolytic streptococci; there is therefore no justification for isolating in hospital individuals with streptococcal sore throat and a rash, and not those with a similar sore throat and no rash. To do so does not protect the community. But it is impracticable to remove to hospital all with streptococcal sore throats. Whether or not hospital treatment should be given must be decided by the needs of the patient. Cross-infection, largely responsible for the complications of scarlet fever, does not occur if the patient is nursed at home; this is one of the main reasons for advocating home treatment wherever possible.

The possibility of the spread of infection by milk or foods consumed uncooked cannot be ignored, nor can the risk of infecting a woman in the later stages of pregnancy. A case of scarlet fever in a household containing a food-handler or a woman approaching confinement should therefore not be nursed at home. Admission of cases of scarlet fever to hospital should be determined by: (1) the severity of the disease; (2) the home nursing facilities; (3) the employment of another member of the household in the preparation or distribution of food for public consumption; and (4) the approaching confinement, say within one month, of any female in the patient's home.

#### Comment

The memorandum on scarlet fever summarized above is a useful move in tackling the complex problem of streptococcal infection. The occurrence of scarlet fever in an individual requires at least three components: a toxigenic haemolytic streptococcus, a low antistreptococcal immunity which allows the local throat infection, and a lack of antitoxin to the erythrogenic toxin which causes the rash. If antitoxic, but not antibacterial, resistance is present, streptococcal tonsillitis without rash will result. Thus in the same household or school a streptococcal outbreak will be manifested by patients with scarlet fever, others with tonsillitis, and still others who are symptomless carriers of the organism; so that from the point of view of controlling spread of the infection there is little to be gained by isolating the case or cases of scarlet fever and leaving the others at large. The severity of scarlet fever in the past meant that hospitalization was necessary for the proper care and nursing of affected patients. In recent years, with scarlet fever a relatively benign infection and with the realization of the greater need for hospital care of children with measles and pertussis, many local authorities have increased the accommodation for the latter at the expense of scarlet fever. But tradition dies hard, and too many medical men, as well as the lay public, still believe that scarlet fever is a dangerous disease and ought to be nursed in an isolation hospital. In hospital the patient with scarlet fever is usually nursed in an open ward along with other cases of the same disease. Although all have scarlet fever, the infection is caused by half a dozen or more different serological types of the haemolytic streptococcus, and recent work has shown that many of the secondary complications of scarlet fever—e.g., adenitis, otitis media, and relapse—are due to cross-infection with a different serological type of the organism from that causing the original infection. Another drawback to hospital treatment is that the patient frequently acquires a new type of streptococcus which he carries home to infect other members of the family. Thus Forbes (*Lancet*, 1936, 2, 1438) in Brighton has shown that, although home nursing of scarlet fever increased the incidence of secondary cases among household contacts, "return" cases were greatly in excess in the hospital-treated series, and the total incidence of infected contacts was about the same in the two groups.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 1.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	86	10	38	7	6	108	4	32	6	4
Deaths .. ..		2	1					1		
Diphtheria .. ..	724	39	201	119	30	798	45	185	96	22
Deaths .. ..	11	2	5	4		17	1	2	3	
Dysentery .. ..	309	55	103	1	—	109	18	35	—	—
Deaths .. ..				—	—					
Encephalitis lethargica, acute .. ..	1	—	—	—	—	3	—	—	—	—
Deaths .. ..										
Erysipelas .. ..			40	14	1			51	8	7
Deaths .. ..										
Infective enteritis or diarrhoea under 2 years .. ..				5					25	
Deaths .. ..	53	10	12	13	3	56	12	5	11	4
Measles .. ..	2,643	300	436	406	9	19,568	1,166	674	12	99
Deaths .. ..			1	2	1	22		3		
Ophthalmia neonatorum .. ..	74	4	21	—	—	90	6	19	—	—
Deaths .. ..										
Paratyphoid fever .. ..	—	—	2(B)	—	—	3	—	2	—	—
Deaths .. ..										
Pneumonia, influenza* .. ..	1,277	88	11	23	3	1,494	86	13	7	13
Deaths (from influenza) .. ..	32	2	4	1	1	67	9	—	2	1
Pneumonia, primary .. ..		59	266	33	16		60	304	38	24
Deaths .. ..			22					10		
Polio-encephalitis, acute .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..										
Poliomylitis, acute .. ..	6	1	—	—	—	6	—	1	1	1
Deaths .. ..										
Puerperal fever .. ..		3	16	—	—		2	31	—	—
Deaths .. ..										
Puerperal pyrexia† .. ..	168	11	16	4	2	161	16	19	4	—
Deaths .. ..							1			
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..										
Scarlet fever .. ..	2,450	165	243	27	78	2,213	180	282	43	49
Deaths .. ..	2					1				
Smallpox .. ..	1	—	—	—	—	—	—	—	—	—
Deaths .. ..										
Typhoid fever .. ..	5	—	—	10	3	15	2	7	16	—
Deaths .. ..										
Typhus fever .. ..	—	—	—	1	—	—	—	—	9	—
Deaths .. ..										
Whooping-cough .. ..	2,141	212	116	88	16	2,078	177	214	15	23
Deaths .. ..	13	2		7	1	11	2	4	1	1
Deaths (0-1 year) .. ..	396	56	84	52	25	423	53	79	41	43
Infant mortality rate (per 1,000 live births) .. ..										
Deaths (excluding stillbirths) .. ..	5,076	823	631	289	151	4,962	707	650	253	187
Annual death rate (per 1,000 persons living) .. ..			14.5	18.9	†			14.7	16.6	†
Live births .. ..	7,451	903	959	439	299	6,773	786	969	398	292
Annual rate per 1,000 persons living .. ..			19.5	28.7	†			19.8	26.2	†
Stillbirths .. ..	217	17	31			219	28	47		
Rate per 1,000 total births (including stillborn) .. ..			31					46		

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

All communications which appear in this column should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, 11, BEDFORD SQUARE, LONDON, W.C.1. All communications should be forwarded for publication and are understood to be offered to the British Medical Journal alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.

### ANY QUESTIONS?

#### Ending Lactation

**Q.**—Nineteen days ago a woman began a ten-day course of stilboestrol to end lactation. The flow of milk has ceased, but it is still possible to express a drop of milk from the nipples. How long should it be before the breasts dry up completely?

**A.**—If the breasts are not stimulated by attempts at expression, suction, or other local interference, production of milk will probably cease completely within a few weeks. A definite period of time cannot be stated, since it is known that in some women milk, or at least some fluid secretion, can be expressed from the nipples for many years after breast-feeding has been discontinued.

#### Recurrent Ulcers on Tongue

**Q.**—A married woman aged 35, with one child, has had small ulcers on her tongue and buccal mucous membrane for about eighteen months. No septic focus can be found. The teeth are normal; Wassermann negative; fractional test meal and blood count normal. These ulcers occur in crops about every 10 to 14 days, last about a week, and then there is a period of freedom for about a fortnight. When the patient was at the seaside for about a month the lesions disappeared. The diet is good and she is having vitamin C and nicotinic acid. How should I treat the condition?

**A.**—A series of questions on this topic has been answered since this column was opened, and it is obvious that this type of stomatitis is both common and intractable. It is probably due to infection by the virus of herpes simplex, and like other manifestations of this disease it may be aggravated by local irritation, systemic disease, or emotional upsets. The lessening of work and worry probably accounts for the relief at the seaside. A mixture containing 10 gr. of potassium chlorate and 10 minims of tincture of perchloride of iron per dose is an old-fashioned remedy which may be given every four hours to abort an attack when the premonitory symptoms occur. A simple alkaline antiseptic mouth-wash may also be useful. If the ulcers are very painful they may be painted with silver nitrate or gentian violet, or powdered with orthoform in a mixture of chlorbutol and boric acid. To prevent recurrence, vaccination of the subject on the skin of the limbs or buttocks has been recommended, either with the clear fluid obtained from the vesicles or with ordinary vaccinia lymph. It would be wise to consult a virus pathologist before embarking on the former of these procedures, to avoid the risk of transmitting some other infection.

#### Early Closure of Fontanelle

**Q.**—A female infant 15 weeks old has her anterior fontanelle completely closed. Since this is unusual, can you give me any further information on the subject?

**A.**—Early closure of the fontanelle always raises the unfortunate suspicion of microcephaly. Hence it is important to measure the skull carefully and at intervals to make sure growth is taking place. On the other hand, although uncommon, this early closure is apparently quite consistent with a perfectly normal development of brain and skull. If the child is attempting to hold up her head, and otherwise seems normal, the fontanelle closure can be ignored.

#### Veneral Diseases Listed

**Q.**—How many venereal diseases are there? I can name gonorrhoea, syphilis, paradenitis venerea, soft sore, scabies, pediculosis pubis, herpes praeputialis, granuloma venereum. What is soft sore, and where is it described? What connexion, if any, has Ducrey's bacillus with the above?

**A.**—How many venereal diseases there are depends on the definition; officially there are three: syphilis, gonorrhoea, and soft chancre. Many people regard any disease arising directly as a result of

promiscuous sexual intercourse as venereal. The list given seems fairly comprehensive, and the only additions suggested are condylomata acuminata (warts), gangrenous balanitis, and bacterial urethritis (non-gonococcal in origin).

Soft sore is another name for ulcus molle, soft chancre, or chancroid. A description of it will be found in any good textbook of venereal disease. It is an acute localized auto-inoculable genito-infectious disease, characterized clinically by necrotizing ulceration at the site of inoculation; the ulcerations are commonly accompanied by inflammation of the regional lymphatic glands, which show a marked tendency to suppurate. The condition is generally held to be caused by an organism known as *Haemophilus ducreyi*, which is a short bacillus growing in chains (streptobacillus).

#### Keloid Vaccination Scar

**Q.**—I was called to see a baby whose arm I had vaccinated 9 months previously. On the site of vaccination I found a raised pink keloid type of scar instead of the usual somewhat depressed and whitened type. The mother thinks that this may be getting redder and larger. The vaccination ran a normal course at the time without any complications. In ordinary wound healing one associates this type of scar with the so-called "tuberculous diathesis," but there is no history of this. But lymph is associated with calves, calves with cows, and cows with bovine tuberculosis. I have been vaccinating a good number of years now, but have not seen this before.

**A.**—The suggestion that keloid is associated with a tuberculous diathesis has no foundation in fact. Overgrowth of fibrous tissue after trauma or inflammation seems to be an individual idiosyncrasy, and may follow healing by first intention as well as by granulation after infection. The chances of acquiring tuberculous infection by vaccination with calf lymph must be millions-to-one against. The 1928 Report of the Committee on Vaccination states that between 1911 and 1925 no deaths attributable to tuberculosis occurred among 5½ million vaccinated babies, who incidentally would be very susceptible to tuberculous infection. Great precautions are taken against the risk of contaminating vaccine lymph by pathogenic bacteria or viruses. Thus, every animal is examined post mortem after the lymph has been harvested, and the batch is rejected if there is any evidence of tuberculosis or other disease. Again, while the Government Establishment lymph is from calves, other brands—e.g., that of the Lister Institute—are prepared in sheep, which are practically immune to tuberculosis. Keloid is perhaps best treated by radium or x rays, although surgical excision need not give rise to fresh keloid.

#### Primogeniture in Multiple Births

**Q.**—There has been some argument in this part of the world (Deccan, India) as to who is considered legally the elder in a case of twins or triplets. Is it the one that is born first or last? An Indian lawyer of repute is said to have proved to a jury that the last-born is the elder. He produced in court a narrow bottle and two ping-pong balls. He placed them one after the other in the narrow bottle. Then they were "reproduced." The ball that had gone in first was the one that came out last. From this he argued that the last-born was the first conceived, and so the elder.

**A.**—All enduring legal rules are based on practical experience and possibility of proof. Whereas the exact moment of conception is still a matter of guesswork, the exact moment of birth can nearly always be fixed by evidence. Primogeniture is therefore a satisfactory test of seniority in many systems of law apart from ours, without doubt also in that of the ingenious advocate's forefathers.

#### Size of Penis

**Q.**—I have been asked by several patients during the past year or two whether "sex-gland treatment" will increase the size of the penis. In most instances potency has been normal, but the patient has the impression that the penis is abnormally small. Has the male hormone any effect in such cases?

**A.**—The size of the penis varies considerably among normal men. It is therefore probably determined genetically, as well as endocrinologically, and it is well known that, in addition to the concentration of hormones in the blood, the intrinsic responsiveness of the tissues, or organ, determines the final result of the hormone stimulation. In these circumstances, therefore, it is unlikely that the administration of testosterone would have any effect.

Quite apart from the reality of the dimensions, many men suffer from an inferiority complex, especially in relation to the genitals, and imagine that their penis is smaller than it should be. In the presence of normal potency reassurance on this point, with some explanation of the psychological mechanism, is often sufficient. Where potency is psychologically impaired, more extended psychotherapy is necessary. Where the penis is small because of hypogonadism, testosterone therapy is of benefit. It may be administered by injection of 25 mg. testosterone propionate three times weekly, or by methyl testosterone tablets, 5 mg., dissolved under the tongue t.d.s., both procedures to be carried out for some months; or by



the subcutaneous implantation, under local anaesthesia, of 6 tablets of 100 mg. testosterone, the effect lasting six to twelve months. This treatment, however, will not increase the size of the testes and may even diminish them by pituitary inhibition. Should, therefore, the endocrine disorder be due to a primary pituitary deficiency, the testosterone treatment should be followed by, or combined with, gonadotrophic therapy.

## INCOME TAX

### Sale of Property: Tax on Civilian Earnings

M. G. recently sold a house, making £300 profit on the sale. Is this liable to income tax? Should he be paying tax on civilian earnings up to June, 1942?

\*\* Assuming that the house was not bought with the intention of selling it to make a business profit out of it, the £300 represents a "capital" profit and is *not* taxable. Apparently the civilian earnings ceased at June, 1942; if so no tax would be payable thereon for a subsequent period, but M. G. would normally be liable to discharge any tax due for the period to that date, and there might be some delay on the part of the authorities in applying for the payment. If, however, tax on civilian earnings remains unpaid, M. G. should ask for it to be held over as he would seem to have a claim under Section 6 of the Income Tax (Offices and Employments) Act, 1944, for relief to the extent of the unpaid tax.

### Rent for Consulting Rooms

"DELTA" started a consulting practice a year ago, living in temporary accommodation at £2 2s. to begin with and subsequently renting a furnished house at £5 15s. 6d., as a fixed address and telephone number were essential. What rent can be set against his professional receipts?

\*\* The normal basis of calculation is to apply the ratio of private to professional use, and "Delta" would find it difficult to avoid that basis even on appeal. So much depends on the facts of the case that any general rule would tend to mislead. We can only advise him to divide the rent according to the number and value of the rooms used respectively for private and professional purposes—remembering that the ground floor front is the most valuable part of the premises.

### "Pay as you Earn"

A. R. asks whether a medical man acting as an assistant on a monthly salary comes within "pay as you earn."

\*\* Yes.

### "Pay as you Earn": War Bonus.

M. S. has received an increase in remuneration to salary £550 plus £100 allowance and £49 11s. war bonus, total £699 11s., as from March, 1944.

\*\* He comes within the "pay-as-you-earn" arrangements as from April 5, 1944; the £600 limit under the 1943 Act was removed by the Act passed last month. The war bonus is liable to tax in the same way as the salary.

## LETTERS, NOTES, ETC.

### A "Super" Vitamin: Disclaimer

Sir FREDERICK GOWLAND HOPKINS, O.M., F.R.S., writes: During last few days a statement has been made in certain organs of Press that I am devoting my remaining years to the study of a "super" vitamin. This statement has implications which are not justified, and has caused me some distress. I should be most grateful if you could spare space in your columns to say that it is entirely untrue.

### Erythema Nodosum

Dr. H. GUY DAIN (Birmingham) writes: In "Any Questions?" of April 1 (p. 481), under the heading "Erythema Nodosum," is the statement that "by the time the skin lesion appears it is too late to use sulphonamide treatment." This is contrary to my experience that in many cases of streptococcal origin almost dramatic cures have been obtained by the use of the original sulphonamide. It is only fair to say that the course of other cases has not appeared to be influenced.

### Argyrol and Ephedrine in Saline

RONA LABORATORIES Ltd. (London, N.W.2) write: In your issue of March 11 Messrs. E. W. Barstow and T. D. Whittet, writing on the mixture of argyrol and ephedrine in normal saline, refer to "the proprietary article." This obviously means our nasal drop "argotone," and we ask the courtesy of your column to comment on their statement. Anyone who has read the communication from Messrs. Barstow and Whittet might well be under the impression that the mixture prepared according to their own process and the proprietary article are "indistinguishable." If, however, one reads carefully a subsequent article signed by the same authors and published in the *Pharmaceutical Journal* of March 25 (p. 121), it can

be seen that the preparation made according to their process shows a precipitate after six weeks. It is therefore obvious that their preparation is not chemically and therapeutically speaking "indistinguishable" from "argotone," for which we claim, stability for many months under conditions not nearly as good as those prevailing in the Charing Cross Hospital.

### Urinary Damage due to Sodium Bicarbonate?

Dr. E. G. COHEN writes: Mr. J. T. Rice Edwards's letter (Jan. 22) on suppression of urine in a case of partial gastrectomy was interesting. The patient had 14½ g. sulphathiazole (the odd tablet number seems erroneous with even tablet dosage) and presumably 12 to 15 drachms of sodium bicarbonate. On Dec. 2 this patient had, in my opinion, extrarenal uraemia with suppression of urine. No mention is made of delayed shock owing to fluid imbalance, so I take it this factor can be ruled out. The pH of the urine, and whether any debris or crystals were passed in the first specimen, are not mentioned. In the absence of these observations, I would point to a similar occurrence—viz., alkalosis—and with it uraemia as gauged by high blood urea levels—for example, 300 mg. %—in cases of peptic ulcer taking sodium bicarbonate indiscriminately. A normal person requires to ingest some 4 to 5 g. of sodium bicarbonate before passing alkaline urine. In this case the total dosage was about 50 g. over three days. The mechanism of the coincident uraemia is ill understood; I certainly have had no satisfying explanation from the biochemists. Sulphathiazole is the most soluble of the "sulpha" drugs, and though it may have been responsible for urinary damage on a dose of 14½ g., I am of the opinion that the sodium bicarbonate was to blame. The treatment by hydration of the patient was excellent therapeutically.

### Prenatal Examination

In the *Journal* of March 4 (p. 347) a question was asked about prenatal examination. A correspondent draws our attention to the pamphlets issued by the Eugenics Society (69, Eccleston Square, London, S.W.1). One pamphlet is entitled "Health Examination before Marriage," which is addressed "to those about to get married; also to their parents." Notes are issued, too, for the doctor who conducts the pre-nuptial examination, and a schedule is provided, part of which is to be completed by the applicant, and part of it is to be filled up by the examining doctor. The society will issue the schedule to doctors only—not to patients—at a price of 1s. (including the notes for the examining doctor).

### Baptism of Non-viable Infants

Dr. A. PINEY (London, W.1) writes: It is not correct to state that in the Roman Church baptism "may be performed in case of emergency by any adult lay communicant" (April 8, p. 511). The position is that the infant can be validly baptized by any adult who intends to do as the Church does: the question whether the adult be a communicant or not is irrelevant, as are all his (or her) other beliefs and habits. All that is required is the performance of the rite in its bare essentials, together with the proper intention. Furthermore, there is nothing to restrict this power to adults: prudent adolescents—e.g., probationer nurses—can baptize validly. The baptism of premature infants, either *sub conditione* or absolutely, is not covered by a rule as simple as you suggest. It is safe to say: if the child is obviously alive, it can be baptized absolutely, but if there is any doubt, baptism must be conditional—i.e., "If you are alive, I baptize you, etc." May I refer those who wish for accurate information on this and similar matters to *The Catholic Doctor*, by Father A. Bonnar, O.F.M.

The Rev. A. WILSON (Newcastle-upon-Tyne) writes: I have read with interest the reply given under "Any Questions?" on the subject of advice to be given as to baptism in the case of non-viable infants (April 8, p. 510). The reply is, I think, in some respects inaccurate, and perhaps doctors who are interested in this point might like to know Anglican and Roman teaching on the point. (1) From the standpoint of moral theology the separate existence of the child is not judged by whether it "gave signs of life after being completely free from the mother," but from the moment of the infusion of the rational soul, generally held to be at, or shortly after, conception. Therefore not only must baptism be given, if necessary, before actual birth (in this case by the doctor or midwife), but also to any prematurely delivered product of conception. (2) In case of emergency baptism may be given not only by "any adult lay communicant," but by anyone, not even necessarily himself baptized, so long as he has sufficient use of reason, and employs the right matter and form. It is, of course, *preferably* to be given by a cleric before a lay person, and preferably by a baptized person before an unbaptized.

### Corrigendum

The visual angles described in Mr. H. C. Weston's letter on characteristics of vision in fine work (April 15, p. 539) should have been given in seconds (""). The correct references are: 3.125" (secs.), 24.14", 3.39", 24", and 25".

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 29 1944

## WARTIME INCIDENCE OF AND MORTALITY FROM RESPIRATORY TUBERCULOSIS

BY

PERCY STOCKS, M.D., D.P.H.

(General Register Office)

AND

E. LEWIS-FANING, B.Sc.Econ., Ph.D.

(Medical Research Council)

It is now possible to reach certain tentative conclusions about the sources of the increase in deaths from respiratory tuberculosis which occurred in 1940-1, although some years must lapse before statistical data are available to complete the picture. It may indeed transpire that other disturbing factors come so complex that we must remain content with such an incomplete answer as can now be given.

Until recently it was difficult to link together the statistics of notifications and deaths in order to estimate the rate at which new cases of respiratory tuberculosis subsequently proved fatal. One of us (Lewis-Faning, 1943) has now published some data of the durations between notification and death for patients who died of the disease in the County of Middlesex in the periods 1937-9 and 1940-1, by means of which the rates of dying in the immediate pre-war period can be estimated. Another helpful analysis of the survival rates of patients from whom tubercle bacilli were found has been published by C. Thompson (1943). In the notes which follow we have endeavoured to draw from the data at present available such conclusions as seem possible about incidence and mortality from respiratory tuberculosis during the first four years of the war. Throughout the discussion the term "notifications" means the formal notifications during life, and excludes the deaths of persons who had not previously been notified and answers from one area to another.

declined continuously from 1925 to 1939, except in two of the "influenza" years, 1931 and 1937. Deaths declined less regularly, interruptions occurring in 1924, 1927, 1929, 1931, 1933, and 1937, when influenza was epidemic. The ratio of deaths to the notifications of the year preceding showed no consistent change between 1922 and 1939, ranging between 0.46 and 0.54. With the ratio based upon a simple weighted summation of the notifications in the current and three preceding years the variation was still smaller (0.473 to 0.527 in the period from 1922 to 1939). It is evident from this that more reliance can be placed on the statistics from 1922 onwards than was the case in the early days of tuberculosis notification, and that they are reasonably consistent with those of deaths. A sudden increase in these ratios occurred in 1940, to 0.61 and 0.59 respectively, followed in 1942 by a fall below the normal range of values, to 0.47 and 0.48, somewhat greater than that which occurred in the years following influenza epidemics. A further fall in the ratios in 1943 is indicated by the provisional figures. It may be that the ratios will not return to the pre-war level owing to the effects of selection for national service on the one hand and radiography on the other in bringing sligher cases into the notification net.

The Middlesex deaths from respiratory tuberculosis in 1937-9 of persons who had been notified at some time and were known to the local authority were found to be distributed according to duration since notification as follows: Less than 1 year, 42%; 1 year but less than 5, 45%; 5 years but less than 10, 10½%; 10 years and over, 2½%. Assuming the 60,443 deaths of notified persons in England and Wales in those years to have had the same proportionate distribution, they can be related to the numbers of notifications from which they were derived if we also make the simplifying assumption that the durations of 10 years and over were all included within the range 10-15 years. The latter assumption cannot introduce an appreciable error owing to the small frequencies after 15 years and the form of the frequency curve. The results of this calculation are shown in Table II.

TABLE II.—Rates of Dying from Respiratory Tuberculosis after Notification in Four Duration Groups (1937-9 data)

Years from Notification	Deaths of Notified Persons, 1937-9		No of Notified Persons from Whom Derived†	Death Rates per 100 Originally Notified	No Dead of Respiratory Tuberculosis at End of Interval out of 100
	Middlesex*	England and Wales			
0-1 ..	925	25,402	114,642	22.16	22.2
1 ..	957	27,105	493,227	6.50	44.2
5- ..	234	6,425	736,299	0.57	43.6
10-15 ..	55	1,511	820,068	0.15	49.5
	2,201	60,443			

\* Comprises deaths of all patients known to the local authority during life.

† At 0-1 year:  $\frac{1}{2}$  (1926) +  $\frac{1}{2}$  (1937) +  $\frac{1}{2}$  (1938) +  $\frac{1}{2}$  (1939).

‡ At 1-5 years:  $\frac{1}{4}$  (1932 + 1935) +  $\frac{1}{4}$  (1933 + 1937) +  $\frac{1}{4}$  (1934 + 1936) +  $\frac{1}{4}$  (1935).

§ At 5-10 years:  $\frac{1}{4}$  (1927 + 1934) +  $\frac{1}{4}$  (1928 + 1933) +  $\frac{1}{4}$  (1929 + 1932) +  $\frac{1}{4}$  (1930 + 1931).

|| At 10-15 years:  $\frac{1}{4}$  (1922 + 1929) +  $\frac{1}{4}$  (1923 + 1928) +  $\frac{1}{4}$  (1924 + 1927) +  $\frac{1}{4}$  (1925 + 1926).

TABLE I.—New Cases and Deaths, 1923 to 1943, England and Wales

Year	No. of Notifications	No. of Deaths of Notified Persons	Ratio of Deaths to New Cases	
			Of Year Preceding	Of Current and 3 Preceding Years‡
1922 .. ..	55,664	29,600†	0.50	0.492
1923 .. ..	53,387	28,003†	0.50	0.490
1924 .. ..	55,040	28,500†	0.52	0.515
1925 .. ..	56,626	28,250†	0.51	0.512
1926 .. ..	55,475	26,750†	0.46	0.473
1927 .. ..	53,389	27,100†	0.49	0.491
1928 .. ..	52,510	26,030†	0.49	0.479
1929 .. ..	52,031	27,176	0.52	0.511
1930 .. ..	49,187	25,769	0.50	0.492
1931 .. ..	49,505	25,888	0.53	0.513
1932 .. ..	46,779	24,240	0.49	0.491
1933 .. ..	44,482	24,349	0.52	0.515
1934 .. ..	43,034	22,633	0.51	0.498
1935 .. ..	39,635	21,707	0.50	0.501
1936 .. ..	39,336	20,779	0.52	0.504
1937 .. ..	39,630	21,177	0.54	0.527
1938 .. ..	37,879	19,473	0.49	0.496
1939 .. ..	34,930	19,793	0.52	0.522
1940 1st half ..	19,470	10,430	0.61	0.558
2nd .. ..	16,681	21,483		
1941 1st .. ..	20,451	20,850	0.58	0.565
2nd .. ..	19,048			
1942 1st .. ..	21,002	18,465	0.47	0.484
2nd .. ..	19,652			
1943 1st .. ..	22,350*	18,750*	0.46*	0.470*
2nd .. ..	20,170*			

\* Provisional estimates.

† Estimated as 90% of total deaths, the proportion in 1929-33.

‡ (Current year + twice preceding year + sum of 2nd and 3rd years back)

Table I shows the numbers of notifications and of deaths of notified persons in England and Wales in each year 1923 to 1942, and provisional figures for 1943. The notifications

Fitting a smooth curve to the numbers of notified persons dead of the disease at the end of 1, 5, 10, and 15 years, the "trial" rates in column 1 of Table III were obtained. These rates were then applied to each year separately, as in Table IV, and the resulting deaths in 1937, 1938, and 1939 were aggregated at the four age groups and compared with the numbers required by the Middlesex proportions. The curve was then slightly adjusted so as to produce the exact aggregates required in 1937-9, the adjusted rates being as shown in columns 2 and 4.

TABLE III.—*Rates of Dying from Respiratory Tuberculosis in Each Year After Notification (1937-9 data)*

Interval After Notification (years)	Estimated No. Dead of the Disease at End of Interval Specified out of 100			No. Expected to Die of the Disease during Each Successive Year out of 100 originally Notified
	England and Wales		Middlesex	
	(1) Trial	(2) Adjusted	(3) Adjusted	
0-..	22.2	22.2	18.5	22.2
1-..	31.2	31.2	26.5	9.0
2-..	37.2	37.5	32.1	6.3
3-..	41.5	41.8	35.9	4.3
4-..	44.2	44.5	38.3	2.7
5-..	45.7	46.0	39.8	1.5
6-..	46.8	47.1	40.9	1.1
7-..	47.6	47.9	41.7	0.8
8-..	48.2	48.5	42.3	0.6
9-..	48.6	48.9	42.7	0.4
10-..	48.9	49.2	43.0	0.3
11-..	49.1	49.4	43.2	0.2
12-..	49.3	49.6	43.4	0.2
13-..	49.4	49.8	43.5	0.2
14-..	49.5	49.9	43.6	0.1

The rates indicate that in the pre-war period about 22% of persons with respiratory tuberculosis died of the disease within a year of being notified, 44½% within 5 years, and 49% within 10 years; and that 50% died eventually of the disease. With this may be compared the survival rate of about one-seventh for sputum-positive patients after 10 years as found by Thompson (1943).

As a check on this result the same process was carried out for the County of Middlesex. In 1938-9 deaths of notified persons formed 91% of the total deaths of residents from respiratory tuberculosis, this being the same proportion as in England and Wales; it was assumed, therefore, that in the period 1922-37 the national proportions applied also to the county. Since the county population was growing rapidly in that period the notified persons from whom the deaths in 1937-9 were derived had not all been notified within the county, and it was assumed that the immigrant population had experienced in each year the notification rates of England and Wales less Middlesex. The result of this calculation is shown in column 3 of Table III. As might be expected in this southern county, whose standardized death rates in 1931-5 were only 85% of the national rate at ages 15-35 and 87% at ages 35 and over (Registrar-General, 1935), the rates of dying after notification were consistently lower than for England and Wales by about one-seventh, though the form of the two curves was very similar. Within 5 years 38% died of the disease in Middlesex compared with 44½%; and 43½% died of it eventually instead of 50%. It seems probable from this comparison that local variations in mortality are largely due to fatality differences and not necessarily to differential incidence. If the data were available for similar calculations in Wales, Liverpool, Tyneside, and other areas of high standardized mortality, the resulting fatality rates would no doubt be found to be greater than the national figures, which represent averages for the whole country.

On the assumption that the deaths which occurred in England and Wales in each year 1935 to 1942 were related to the numbers notified in the successive periods mid-1925 to mid-1926, etc., in accordance with the adjusted rates of dying in Table III, the expected deaths would have compared with the numbers of deaths of notified persons actually registered as shown in Table IV. Provisional data are also given for 1943.

The last line but one in the table shows that there was an excess of about 440 deaths in 1937 over the expected number, followed by a deficiency of about 770 in 1938, due in all probability to the earlier deaths of many tuberculous persons brought about by the "influenza" epidemic at the beginning

TABLE IV.—*Estimated Numbers of Deaths of Notified Persons from Respiratory Tuberculosis expected at each Duration and of all Durations, 1935 to 1943, compared with Total Annual Deaths Registered*

Interval After Notification (years)	No. of Deaths (in Hundreds) expected from Pre-war Rates of Dying, in									
	1935	1936	1937	1938	1939	1940	1941	1942	1943	
0- ..	91.8	87.4	87.7	86.0	80.8	82.0	82.4	83.9	92.4	
1- ..	39.4	37.2	35.4	35.5	34.9	32.8	33.2	33.4	36.1	
2- ..	28.7	27.6	26.0	24.8	24.9	24.4	22.9	23.3	23.4	
3- ..	20.7	19.6	18.8	17.8	16.9	17.0	16.7	15.7	15.9	
4- ..	13.3	13.0	12.3	11.8	11.2	10.6	10.7	10.5	9.9	
5- ..	7.6	7.4	7.2	6.8	6.6	6.2	5.9	5.9	5.4	
6- ..	5.7	5.6	5.4	5.3	5.0	4.8	4.5	4.3	4.3	
7- ..	4.2	4.2	4.0	3.9	3.8	3.6	3.5	3.3	3.2	
8- ..	3.3	3.2	3.1	3.0	3.0	2.9	2.7	2.6	2.5	
9- ..	2.2	2.2	2.1	2.1	2.0	2.0	1.9	1.8	1.7	
10- ..	1.7	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4	
11- ..	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.0	
12- ..	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	
13- ..	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	
14- ..	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.4	
Total deaths expected from notifications, ..	222.5	213.0	207.4	202.4	194.6	191.6	189.6	194.6	199.3	
Actual deaths of notified persons, ..	217.1	207.8	211.8	194.7	197.9	214.8	208.5	184.6	(187.5)	
Excess or deficiency, ..	-5.4	-5.2	+4.4	-7.7	+3.3	+23.2	+18.9	-10.0	(-12.4)	
Deaths of unnotified persons, ..	21.3	22.4	20.4	18.1	17.5	21.8	27.8	25.2	(25.0)	

of 1937. Had there been no war and had notifications continued to fall at the same rate as between 1933-5 and 1937-9, the numbers in successive years 1940 to 1943 would have been 35.0, 33.8, 32.6, and 31.4 thousands instead of the number shown in Table I. The resulting deaths would then have been as follows, instead of the expected numbers shown in Table IV:

Interval after Notification	Deaths (in Hundreds) Expected if Downward Trend of Notifications had Continued			
	1940	1941	1942	1943
0-..	77.6	76.4	73.7	71.0
1-..	32.8	31.5	31.0	29.9
2-..	24.4	22.9	22.0	21.7
3-..	17.0	16.7	15.7	15.0
4-..	10.6	10.7	10.5	9.8
5-..	19.5	18.5	17.9	17.5
10 and over	5.3	5.2	4.9	4.9
Total	187.2	181.9	175.7	169.8
Deficiency below deaths expected from actual notifications	-4.4	-7.7	-18.9	-29.7

This shows that if the rate of dying from the disease after notification remained unchanged, the extra incidence of respiratory tuberculosis brought about by war conditions must have resulted in about 1,200 deaths in 1940-1, about 1,900 in 1942, and about 3,000 in 1943, a total of 6,000 in excess of the number which would have resulted had the pre-war trend of notifications continued undisturbed. The increased fatality during 1940-1 would not affect this number considerably, since the bulk of the increase in incidence occurred later. While it is probably true that part of the increase in notifications has been merely due to a roping in of people suffering from the disease who would in normal times have escaped notification, there has been no compensating fall in the deaths of unnotified persons during the war, but rather a rise, as shown at the foot of Table IV. The reason for this may be that more immigrants have come into England and Wales from countries where tuberculosis incidence is high, and also that excessive movement of the population from place to place has led to more people escaping notification.

In addition to the 6,000 deaths attributable to excessive wartime incidence of new cases, Table IV shows that an excess of deaths over the numbers expected from the actual notifications occurred in 1940-1 amounting to 4,210, and this was followed by a deficiency in 1942-3 amounting to 2,200. The

only satisfactory explanation of this happening (which was anticipated, since it has been seen before in lesser degree in years with influenza epidemics and cold winters) is that the rate of dying of patients already notified was temporarily enhanced by the hard conditions of 1940-1. By this shortening of the normal survival period at least 2,200 notified patients apparently died of the disease during 1940-1 who under normal conditions would have not died of it until 1942-3. Probably the number was several hundreds greater than this, for tuberculosis deaths in the December quarter of 1943 were considerably increased by the influenza epidemic of November-December, thereby neutralizing part of the deficiency which would otherwise have been apparent for 1943 as a whole. That a considerable temporary increase in the short-term fatality rate did occur in 1940-1 and that it was followed by a compensating fall below the ordinary level in 1942-3 is shown by the last column of Table I. From 0.51 in 1936-9 the ratio increased to 0.59 in 1940 and 0.56 in 1941, falling to 0.48 in 1942 and 0.47 in 1943.

In the work on Middlesex deaths by one of us (Lewis-Faning, 1943) it was found that in 1940-1 1,610 deaths from respiratory tuberculosis of notified persons were distributed according to the interval since notification as follows: 701 under 1 year, 665 after 1 but less than 5 years, and 244 after 5 or more years. If all the deaths of notified persons in England and Wales during 1940-1 were similarly distributed the composition of the excess of 4,210 deaths according to interval since notification must have been as shown below.

	Under 1 Year	1-4 Years	5 Years or more	All Durations
Actual deaths 1940-1 in Middlesex proportions	18,430	17,480	6,420	42,330
Expected deaths (Table IV)	16,440	16,830	4,850	38,120
Excess over expectation	1,990	650	1,570	4,210

These figures are quite consistent with the supposition that some 2,500 patients died in 1940-1 instead of in 1942-3. Table IV shows that there must have been at least 10,000 patients notified less than a year living in 1940-1 who were expected to die in 1942-3, and 1,990 of them might well have died earlier; similarly there must have been at least 7,000 patients notified 1 to 4 years living in the first period who were expected to die in the second, and 650 of them might have died earlier as a result of the severities of 1940-1. This would more than account for the transfer of 2,200 deaths; and the rest of the increase could be explained by breakdown of patients in whom the disease had become quiescent and who in normal conditions would not have died of the disease at all, or not in this country. It is not to be supposed that in the disturbances of 1940-1 the Middlesex proportions were exactly representative of those in the country as a whole and that what happened was precisely as suggested above. The purpose of quoting the Middlesex 1940-1 data is mainly to correct an impression given by the paper in which they were analysed that they seemed inconsistent with the view that any considerable part of the increase in tuberculosis deaths in the early part of the war was attributable to shortening of life of patients who already had the disease. One would hesitate to proceed further than Table III in applying the method of analysis used here to those data, owing to the disturbed state of residence of the population of that county in 1940-1. But this more comprehensive analysis, based as it is on data for the whole country (where the objection does not apply) suggests that about 2,500 of the deaths in 1940-1, or three-quarters of the excess over the 1938-9 total, were accounted for by shortened duration.

#### Summary

In the period 1923-39, despite the rapid fall in the numbers of notifications of and deaths from respiratory tuberculosis, the average expectation, for a person just notified, of eventually dying of the disease remained remarkably constant at approximately one-half in England and Wales as a whole.

Immediately before the war the average expectation of dying within a year of notification was about 22%, and within 5 years about 44%. For Middlesex County the curve showing the rate of dying after notification was similar to that for the country as a whole, but at a lower level—43% eventually dying of the disease

instead of 50%. This lower fatality corresponds with the lower standardized death rates in the county as found for 1931-5.

Had the incidence of new cases continued to decline as in the pre-war period, instead of increasing, some 6,000 fewer deaths would have occurred during 1940-3 under normal conditions.

Owing to a temporary rise in short-term fatality during the severe conditions of 1940-1 some 2,500 notified patients probably died in those years instead of in 1942-3. Another 1,500 notified persons and about 1,000 unnotified persons who in normal circumstances would not have died of the disease at all in this country must have died of respiratory tuberculosis during 1940-1.

#### REFERENCES

- Lewis-Faning, E. (1943). *British Medical Journal*, 2, 684.  
Registrar-General's Statistical Review for 1935: Text; Table XCVII.  
Thompson, B. C. (1943). *British Medical Journal*, 2, 721.

## THE RELATION OF DERMATOLOGY TO PSYCHIATRY\*

BY

F. F. HELIER, M.D., F.R.C.P.

Lieut.-Col., R.A.M.C.; Command Dermatologist

The expansion of psychiatry in the Army has provided opportunities for liaison with other branches of medicine such as have never been available before, and, under the controlled and standardized conditions of Army life, the importance of the personality factor in all diseases is being more and more appreciated. It was therefore with great pleasure that I accepted an invitation to present the dermatologist's point of view to a gathering of psychiatrists; nor is this inappropriate, as, embryologically speaking at least, psychiatry is an offshoot of dermatology, and a fundamental association persists into adult life.

#### The Hypersensitive Subject

L. Brocq divided skin conditions into two groups—skin diseases proper and skin reactions. The former usually have a specific aetiological agent which produces a characteristic lesion in anyone affected. Thus the *Spirochaeta pallida* causes the same kind of chancre in any uninfected person, and prolonged exposure to spinning-oil a classical epithelioma. When these lesions are treated adequately the condition is finished with and there is no increased likelihood of a fresh attack. In contradistinction to this, a skin "reaction" depends for its characteristic type on the make-up of the patient and not on the specificity of the external factor. Whealing may be produced in one patient by tinned salmon, in others by getting warm or cold or rubbing the skin, and in another because he is upset psychologically, but most people do not develop wheals at all under normal conditions. Here the personality of the patient is all-important; only if he is made in a special way will he produce a wheal with his characteristic stimulus, otherwise it will have no effect at all. A reaction may be simple, like flushing, or more complicated, like eczema or psoriasis, but all behave in essentially the same way. Thus one patient may develop psoriasis whenever he has a sore throat; another if his skin is injured by a scratch; another whenever he undergoes a period of stress, as instanced by one man I recall whose rash recurred every time he took a medical examination. The eczema patient similarly reacts badly to adverse circumstances. Soon after quitting the protection of the womb and meeting the troubles of the world for the first time, he develops infantile eczema. He may adjust himself to his environment, but the rash is likely to return at puberty, at the menopause, and in old age, or at any other time when things go against him. Just as some people react to stress with indigestion, headache, or asthma, so this patient reacts with an attack of eczema and his fellow patient with psoriasis or urticaria; they do so because they are made that way. It is an old gibe that "it is nice to be a dermatologist, because your patients never die, they never get you up in the night, and they never get better." This latter is only too true in many instances, because you can't cure a man of his own personality.

\* Based on a talk given to a meeting of psychiatrists.

### Eczema

Are there any indications of such an abnormal constitution apart from the appearance of a rash? Undoubtedly there are, and they are well illustrated in patients with eczema. The hypersensitivity of the skin of eczema patients is only one aspect of a generally hypersensitive make-up. Such patients are above the average intelligence, but admit to being highly strung, over-conscientious, and worriers; they possess terrific drive, and are very active, both mentally and physically. They have a tremulous tongue and bright eyes almost suggesting exophthalmos in marked cases, they move quickly, and when asked to undress do so with great speed, only hampered by the marked tremor of their hands. They have been well described as 100-horse-power engines in 60-horse-power bodices. Even in infancy the picture is typical. The child is obviously intelligent, full of unbounded energy, but rather irritable; a familiar trio in the dermatologist's room is the worn-out, over-anxious mother, the worried short-of-sleep father who is continuously retrieving his restless son and telling him not to scratch, and the child who is the picture of health apart from his scratched face and his resentment at being interfered with. The following description by a psychologist portrays just such a child, though actually it is describing the child with asthma:

"He has an intelligence much above the average; he is irritable and aggressive, quick to respond; he is over-anxious, insecure, un-selfconfident. As a result of his insecurity he often appears at first sight repressed and submissive, but even then there is generally an air of subdued tension about him, and, given the opportunity for freer and more confident self-expression, he becomes aggressive and domineering. He is, in fact, the type of child who makes more demands upon his parents, particularly his mother, than almost any other. He is an intelligent individual who twists her round his finger, aggressive enough to get his own way and anxious enough to demand her continual attention." (Rogerson, 1943.)

### The Problem of Treatment

The recognition of the type of patient is easy, but how can one help him? The application of ointments and x rays will literally only touch the surface of the condition; if we are to obtain permanent benefit we must tackle the patient as a whole and consider his personality and environment. The problem may be divided into two parts: the discovery of the immediate factor which caused the present attack, and the wider aspect of the adjustment of the patient's attitude to life and his skin condition. The former is often surprisingly simple; the patient is only too willing to pour forth his troubles to a sympathetic listener, and, helped by a few judicious questions, soon reveals marital or financial worries, a period of strain, or some emotional shock which seems to bear a direct relation to the current attack and which the patient is ready to accept as such. The solution to these problems is often possible, using common sense and a little persuasion. More difficult is the problem of altering the patient's outlook and mode of existence so that he may be protected from stresses and strains which his hypersensitive make-up cannot support. One aims at giving the patient insight into his condition, reassuring him that it can be controlled if he goes about it the right way, and modifying his environment. In many cases this common-sense psychology will succeed; but in others one is faced with a severe anxiety state, and it is sensed that there are hidden stresses in the patient's mind that one has failed to expose. One is often reduced to giving these patients bromide—a confession of failure—and it is in such cases that one turns for help to the trained psychiatrist.

I would here refer to an experiment in rehabilitation which the Army has started and which I have been privileged to supervise. An auxiliary hospital has been set aside for chronic skin cases which have failed to stand up to Army life. The object of the scheme is twofold: first, the men have a set routine of work of at least five hours a day doing domestic work, workshop jobs, gardening, harvesting, etc. This is to keep their minds occupied so that they do not sit and brood all day over their skins. Secondly, they do fairly strenuous work, including P.T., which keeps them physically fit and gives them confidence that their skin will stand up to exercise, even though it may make them sweat; and thus the man returns to his unit unafraid of the consequence, and the shock of the transition

from the shielded atmosphere of the hospital to active life is graduated. I err on the side of risk rather than caution, and let eczema patients bathe and seborrheic sweat; if I would rather have a man break down in hospital, if he is going to do so, than when he has got back to his unit. The experiment is only in its infancy, but so far the results seem to justify it.

While discussing eczema I must mention one important symptom—itching. If anyone doubts that itching can be produced purely by psychological factors, he has only to observe a class of students to whom one has demonstrated a head full of lice. It is significant that the word "itch" also means "desire," and that a patient will often say that he has had "lovely scratch"; such phrases derive from the pleasurable element in scratching, which may weigh heavily against the patient's expressed desire to get better. In severe cases of itching the patient may work himself into a fury of scratching utterly uncontrollable and increasing until finally he falls into an exhausted languor, the whole process clearly justifying the description of an orgasm of scratching, with all that this implies psychologically. Certain sites are peculiarly prone to itch, especially the anus and vulva. Part of the reason for this is that these areas are moist from sweat and soiled with irritating faeces or glycosuria, etc.; once irritation has started in an area the threshold for stimuli is lowered because the patient's attention is concentrated on the part, and this leads to further scratching, which in turn increases the itching. I need not, however, emphasize the psychological significance of these sites and the problems associated with the patient's absorption in them.

### Nervous and Emotional Factors

Rosacea is a condition which demonstrates very clearly the importance of nervous factors in the development of skin manifestations. Rosacea has been described as pathological flushing, and any factor which increases the redness of the face may precipitate or aggravate the condition in a predisposed person. Such factors are the excessive intake of alcohol or tea, often with an associated gastritis; the menopause and pelvic disorders; local sepsis in teeth or antra; and exposure to extremes of heat and cold, especially when the latter is combined with wind. One or more of these are usually emphasized in discussions on the cause of rosacea, but the most important factor—the psychological one—is often neglected, though it is obvious that blushing is closely bound up with emotional reaction. Actually, investigation of rosacea patients rarely fails to reveal an abnormal personality. They are usually of the shy retiring type, unwilling to make social contacts, self-conscious, and sensitive about their appearance, so that as the condition progresses they tend to retire more and more into their shells. The commonest type of patient with rosacea in my experience is the unmarried schoolmistress from 35 to 45 years old. Klaber and Wittkower (1939) investigated a series of 50 cases of rosacea and found that "35 of the cases (in contrast to 11 of the control group) described themselves as quiet, reserved, and serious-minded children. They disliked parties, games, and group activities; preferred to play alone, and were fond of reading and thinking. They made few friends. . . . 15 rosacea patients, in contrast to 39 controls, described themselves as lively, sociable, and care-free children. . . . The onset of rosacea was preceded in 13 cases by an acute emotional trauma, serious enough to be regarded as a precipitating factor, and in 20 cases by prolonged emotional stresses." The following case of mine illustrates the importance of the psychological approach:

Miss A. (35), a schoolmistress, is one of four sisters. The other three are married, but she had to break off her engagement in order to look after her father and mother. She lived with her parents in a large old house which was very inconvenient to run, but her father refused to leave it; Miss A. had to do all the housework when she returned home from school in the evenings. Her sisters traded on her self-sacrifice—particularly one, a first-class hysteric, who periodically came home and went to bed for a week. Miss A. has gradually had to abandon all her social activities, including church work, because of her home ties. Three months ago her father became ill and she sat up every night with him, on top of all her other duties. After six weeks he died, and within two days she developed a fierce rosacea. The outbreak was attributed to the strain of nursing her father.



I suggest that the true explanation is that her father was a great burden to her, and subconsciously she must have desired his death, though, with characteristic overcompensation, she sat up every night during his illness. When he died the fulfilment of her suppressed wish produced a sense of guilt lest she had in some way contributed to his death, and as a result she developed a guilty flush—i.e., rosacea. I explained all this to her and told her that she must live more for herself and move with her mother into a small easily run cottage; this, together with some local treatment, produced a dramatic improvement. It has been suggested that the emotional factor acts upon the face only indirectly through its influence on gastric tone, which has been shown to be related to rosacea (Eastwood, 1934). I do not think that it is necessary to introduce this complication when one remembers how directly flushing of the face is related to nervous influences; and, anyhow, the important thing is that all cases of rosacea should be considered from the psychological aspect.

That worry makes the hair fall out is a popular conception. I would go further and say that all cases of alopecia areata are nervous in origin and that all successes claimed for local treatment are due to suggestion or spontaneous improvement, though I admit that the actual speed of growth of hair is increased by hyperaemia. One could give endless instances of acute or chronic psychological factors causing alopecia, and there is a type of patient who reacts to adversity by losing his hair and is likely to do so repeatedly whenever things go against him. The following case, which was under the care of Dr. Ingram for several years, and which he has allowed me to quote, is a good illustration of the effect of nervous influences.

A. B., an only boy, suffered from alopecia totalis from about 7 years old. He was given a great variety of treatment at the General Infirmary at Leeds, including ultra-violet light, x rays, hormones, etc., without result. The parents, who lived in an isolated house, kept an anxious watch on the boy's scalp, but each morning failed to reveal any growth even to the closest scrutiny. Finally, after several years of treatment, Dr. Ingram insisted that the boy, who was now 14, should be sent away from home. After his first term at boarding school he returned home with a complete head of hair.

Another condition in which a sudden shock or a definite period of strain plays an obvious part is lichen planus. The onset of this disease is often dramatic; one patient of mine had a sudden attack of haematuria and developed lichen planus two days later, while another broke out the next day after answering the telephone and being told that her best friend had been killed. In these and similar cases the emotional factor is the trigger that sets the condition going, and the case is often rapidly cured; when, however, the rash develops after a period of worry or nervous strain, it may require considerable readjustment in the patient's mode of living before a cure can be effected.

#### Hyperidrosis; Warts

Hyperidrosis is a problem of some magnitude in the Army. The usual sufferer is of the active, highly strung type with tremor of his hands and feet—often a good soldier, but relegated to a low category because of his feet. The condition is almost incurable by ordinary means, though it can be controlled to some extent by foot toilet, sodium hexametaphosphate, etc. An indication of the real cause of the condition is given by the following patient of mine:

Cpl. X., a first-class soldier, but Category C because of severe hyperidrosis, had never had any trouble with his feet until 1940, when he was evacuated from Dunkirk. Since then he has had sweaty feet, which he attributed to wearing boots and marching continuously for five days. Examination showed his feet to be offensive, with the characteristic livid hue over the ball and outer side of the feet and heels, "honeycomb" maceration of the soles, and sodden skin between the toes (this latter is often wrongly diagnosed as ringworm). The hands are sweaty and tremulous.

The explanation is obvious: the experience at Dunkirk made him sweat and tremble with fear, and this emotion has persisted in his subconscious and is responsible for the persistence of his symptoms. Here is a real line of attack on this incapacitating condition, but in most cases it is by no means a simple psychological problem even for the trained psychiatrist.

One final condition might be of interest to the psychiatrist—the common wart. Warts are due to a virus, and are transmitted from one person to another by injecting an encysted wart tissue. Despite this, Bruno Bloch maintained that he could cure 75% of warts by suggestion. My own experience confirms this possibility, and everyone will recall instances of warts being cured by methods which border on the magical. We have here apparently a remarkable instance of the course of an infection being modified by a psychological process, though I doubt if the psychiatrists would appreciate being sent all the patients with warts who crowd the skin clinics.

#### Conclusion

This paper is by no means exhaustive, but I hope it will indicate the importance of the psychological approach to dermatology and the close liaison there should be between the dermatologist and the psychiatrist. In the Army there is now ample provision of psychiatrists, and Army specialists of all kinds, having got accustomed to co-operating with them, will surely demand a similar service when they return to civil practice. Unfortunately exigencies of the Service tend to stress the diagnostic aspect. When we return to civil life we shall no longer be able to dispose of our difficult cases by boarding them to Category E, and it is among these that in the future I hope to see the psychiatrist playing a large part in dermatology.

#### REFERENCES

- Eastwood, S. (1934). *Proc. roy. Soc. Med.*, 27, 1120.  
Klaber, R., and Witkower, E. (1939). *Brit. J. Derm. Syph.*, 51, 501.  
Rogerson, C. H. (1943). *British Medical Journal*, 1, 406.

## SICKNESS RECORDS OF NURSES IN A GENERAL HOSPITAL

BY

JOYCE WRIGHT, D.M.

(University College Hospital Medical School, London)

The attention of hospital administrators in various countries has from time to time been directed to the health of nurses and to the protection of hospital personnel from the occupational hazards of their work. While considerable interest has been shown in the occurrence and prevention of tuberculosis among nurses, comparatively few investigations are recorded on the nature and incidence of other ailments.

"The Maintenance of High Standards of Health in the Nursing Community" was discussed at the Congress of the International Council of Nurses in 1937. Pietzcker (1937) gave the interim two-year report of the Health Statistics Committee, whose research work comprised a five-year plan, starting in 1934. Questionnaires were sent to the best-known nursing schools in 32 countries. They were evidently having educational value, for a 44% return was made in 1935, compared with 22% for the previous year; and hospitals were found to be introducing new measures with regard to staff health.

The United States National League of Nursing Education (1938) in its *Study of the Incidence and Costs of Illness among Nurses* published the results of a survey on the illnesses of student and graduate nurses. Two hundred and twenty-three nursing schools, comprising 17,364 student nurses and 8,794 graduate nurses, returned reports for the year 1937-8. The Study disclosed certain significant facts, among them the following:

- (a) In the country as a whole student nurses had more illness than graduate staff nurses; the annual average number of days of illness per student nurse was 8.3 and per graduate nurse 6.6.
- (b) Clinical students were ill more than preclinical students. The annual average number of days of illness per clinical student was 9.2 and per preclinical student 5.2.
- (c) Students on the paediatric service or on the communicable diseases service had a higher illness rate than clinical students on all other services.
- (d) Average days of illness for both students and graduates were highest in January, February, and March.
- (e) The annual financial cost of hospital treatment for student and graduate nurses was estimated at 3 to 4 million dollars.
- (f) Health records of graduate and student nurses, as measured by days off for illness, were not so favourable as those of college students and of women in the clerical, industrial, and teaching fields.

A comparative study of the health of student nurses and girl college students was made by Diehl (1935), who kept records of minor and disabling illnesses among both groups during one school year. He included only those illnesses which were occasioned by acute infections or by other conditions which might be related to the work. Illnesses incurred by nurses during college vacations were not counted. After allowing for certain factors which might give rise to differences in the sickness rates of the "Nurse Group" and the "College Group," Diehl concluded that the incidence and severity of illness among the student nurses was distinctly greater than among college girls living in a comparable environment. He found that respiratory infections were 2.8 times as frequent among student nurses as among college girls, and superficial pyogenic infections 5.2 times as frequent. He attributed this to the fact that the nurses were more exposed to infection, both cutaneous and respiratory, than other students; that they had longer hours of duty; and that they were deterred from reporting minor illnesses immediately, since they had to make up time lost.

Among nurses at Cook County Hospital, Rhoads and Afremow (1938) found that acute throat infection was the greatest single cause of illness. They followed one class through its period of training and found that, on the average, each nurse was off duty for sickness for 75.5 days (7% of total training time) and that about 27% of this absence was attributable to upper respiratory tract infection. They analysed also the ward distribution of the nurses with sore throat, and discovered that where exposure to infectious diseases was greatest—i.e., the Children's Hospital and the Contagious Diseases Hospital—the incidence of throat infection was highest.

In a recent article Court (1943) reported that among the nurses of an E.M.S. sector hospital respiratory infection took first place both in days lost and in numbers of staff involved. The percentage incidence of staff so affected was 38 in 1941 and 45 in 1942, and was higher among nursing auxiliaries and assistants than among the professional group of trained and student nurses. He regarded the prevention of respiratory infection among hospital personnel as an urgent and important problem.

Sickness figures for a general hospital are given by Branson (1933) in his report on the health of nurses at St. Bartholomew's Hospital for 1922 to 1931. As an index of health he regarded the total independent attacks of illness occurring annually (especially when related to the number of nurses at risk) as more reliable than the figure for "nurse-days" lost. He found that the infections comprised by the terms "sepsis," "catarrhal disease," and "sore throat" provided, in a

### Sickness Records of Nursing Staff in a London General Hospital

In order to obtain more detailed information the sickness records of the nursing personnel at University College Hospital (London), a general hospital with a training school, have been reviewed for the years 1936, 1937, and 1938. More recent data could not satisfactorily be analysed owing to the various administrative changes brought about by the war. About 80 student nurses entered the school each year; on entry all had a medical examination and a radiograph taken of the chest, and were immunized against diphtheria. Including resident masseuses, radiographers, dietitians, etc., and all grades of nurses, the numbers "at risk" were 410 for 1936, 475 for 1937 and 500 for 1938. The analysis was made from the "day book" of the resident medical officer and the home sister who see sick staff each day, and from case records of those who were admitted to the hospital wards. In addition, data were obtained in some cases from infectious diseases hospital and sanatoria to which nurses had been sent for treatment.

TABLE 1.—Number of Attacks and of Days Off Duty for Sicknesses lasting Less than 100 Days

Nature of Sickness	1936		1937		1938	
	No. of Nurses at Risk		No. of Nurses at Risk		No. of Nurses at Risk	
	410		475		500	
Nature of Sickness	No. of Attacks	Days Off Duty	No. of Attacks	Days Off Duty	No. of Attacks	Days Off Duty
Influenza .. ..	26	456	63	939	12	148
Colds .. ..	28	223	26	93	47	318
Sore throat .. ..	47	617	27	414	40	390
Boils, styes, etc. ..	59	637	43	340	96	1,045
Whitlow .. ..	46	639	27	253	57	851
Infectious diseases :						
Chicken-pox .. ..	0	0	4	101	2	97
Diphtheria .. ..	1	83	3	228	0	0
Measles .. ..	3	141	0	0	1	35
Mumps .. ..	1	31	1	13	0	0
Pertussis .. ..	1	28	0	0	0	0
Rubella .. ..	2	17	22	317	0	0
Scarlet fever .. ..	4	306	7	370	0	0
Catarrhal jaundice ..	0	0	5	184	4	174
Glandular fever .. ..	3	143	0	0	2	69
Gastro-enteritis .. ..	34	340	51	355	39	329
Other gastro-intestinal disorders .. ..	5	57	14	152	31	237
Injuries .. ..	22	189	26	214	37	384
Rheumatism, lumbago, and sciatica .. ..	8	129	10	257	11	222
Operations :						
Appendicectomy ..	2	65	0	0	7	324
Mastoidectomy ..	1	92	0	0	1	87
Tonsillectomy .. ..	5	135	0	0	1	132
Other operations ..	2	77	2	133	1	40
Debility, etc. .. ..	9	100	5	81	5	73
Miscellaneous .. ..	31	475	25	269	22	213
Total .. ..	340	4,980	361	4,713	416	5,168

TABLE II.—Number of Attacks and Days Off Duty for Sicknesses lasting More than 100 Days

1936			1937			1938		
Nature of Sickness	No. of Attacks	Days Off Duty	Nature of Sickness	No. of Attacks	Days Off Duty	Nature of Sickness	No. of Attacks	Days Off Duty
Gastric ulcer .. ..	1	104	Appendicitis and Sonne dysentery ..	1	106	Septic glands of neck ..	1	104
Hyperthyroidism .. ..	1	Left	Hysteria and migraine .. ..	1	115	Polio-myelitis, abortive ..	1	143
Influenza and pleurisy .. ..	1	109	Influenza and lobar pneumonia .. ..	1	206	Rheumatoid arthritis .. ..	1	172
Sacro-iliac strain .. ..	1	166	Sinusitis followed by streptococcal septicaemia .. ..	1	236	Tonsillectomy .. ..	1	132
Scarlet fever and arthritis of knee ..	1	292	Sore throat and subacute mastoiditis ..	1	194	Tuberculosis, pulmonary ..	2	(a) 132 (b) 335
Acute rheumatism .. ..	1	148	Tuberculosis :					
			Pulmonary .. ..	3	Left			
			Of ileum .. ..	1	"			
			Unresolved pneumonia .. ..	1	"			
Total .. ..	6	819+		10	857+		6	886-

descending scale of contribution, about 60% of the nurses' illnesses. The heading "sepsis" covered an ill-defined but large group of septic skin conditions—"septic fingers," similar lesions of the feet, and boils. A considerable majority of these cases were "septic fingers," and apparently a good many resulted from safety-pin pricks. In a fair number the disablement lasted for a long time. The term "catarrhal disease" described the miscellany of respiratory infections, such as "colds," "influenza," and their complications; the peak period for these attacks was in the early months of the year, and accounted at times for a considerable depletion of the available staff.

Tables I and II show in summary form the results of the analysis. Only sicknesses which involved absence from duty are recorded. These are divided into two parts—Table I, those of less than 100 days' duration; and Table II, those of more than 100 days' duration. This time-division is arbitrary, and serves merely to give an indication of the long illnesses of each year.

Table I shows that, taking the three-year period as a whole, pyogenic infections—i.e., boils, styes, whitlows, etc.—took first place both as regards number of attacks and number of days off duty. Of a total of 1,117 attacks, 328 (29.4%) were due to pyogenic infections; and of a total of 14,861 sickness-days, 3,765 (25.3%) were due to this cause. Whitlows accounted for 130 (39.6%) of the attacks of pyogenic infection and for 1,743 (46.3%) of the sickness-days.

days due to it. During the three years who were responsible for 11.6% of all sicknesses and for 11.7% of all sickness-days.

With figures only slightly lower than those for pyogenic infections followed the group of upper respiratory tract infections—"colds," "influenza," and sore throat—with 316 attacks (28.3% of all sicknesses) and 3,598 sickness-days (24.2% of the total). Taken together, therefore, respiratory and pyogenic infections accounted, as in Branson's figures, for nearly 60% of all illnesses and for half the number of days off duty.

Under the heading "gastro-enteritis" are included diarrhoea and/or vomiting. This condition tended to occur in outbreaks of two or three cases within a few days, or in larger outbreaks such as those of Nov.-Dec., 1937, and March-April, 1938, when 32 and 25 nurses respectively were affected. The nurses were scattered in different wards, suggesting that they had been infected from a common source—possibly in the home rather than in the hospital itself. (It is interesting to note that one of the nurses in the 1937 outbreak apparently introduced the infection to a children's ward, in which 7 children developed dysentery. From this nurse, and from 4 of the affected children, *Bact. sonnei* was isolated.)

The common infectious diseases (including scarlet fever, which might alternatively be classified as sore throat with rash) numbered 12 in 1936, 37 in 1937 (22 of which were rubella), and 3 in 1938. One case of diphtheria occurred in 1936 and 3 in 1937. The common infectious diseases were important on account of the number of days lost rather than of the number of attacks; during the 3 years they accounted for 4.7% of the total number of illnesses, but for 11.9% of the total sickness-days.

Injuries, including burns and scalds, amounted to 7.6% of all sicknesses and to 5.3% of all sickness-days. Whether or not they were due to hospital mishaps or accidents was not recorded, though in the few instances of lysol burns these were presumably incurred on duty.

Respiratory infection played a predominant part as a cause of the 22 "long illnesses" tabulated in Table II. Four of these were due to upper respiratory tract infections and their sequelae, two to influenza followed by pleurisy or pneumonia, and one to unresolved pneumonia. During the three years 7 of the nurses who suffered from long illnesses left the hospital; of these, 4 had developed pulmonary tuberculosis and 1 tuberculosis of the ileum. Another nurse, who suffered from pulmonary tuberculosis, returned after an absence of 11 months. The figures presented here are too few to form the basis for a discussion on the incidence of tuberculosis among nurses. A growing realization of the tuberculosis risk in hospitals has led to investigations by numerous workers, particularly in Norway and the United States. Soper and Amberson (1939) summarize the situation by stating that prevailing opinion strongly suggests that the incidence of tuberculosis is higher among student nurses than among females of similar age groups in the general population. Tuberculin tests almost without exception indicate year by year an increase of infection out of proportion to that of the general population. These authors advocate certain minimum precautions and stress the importance of case-finding among patients, for they consider that unrecognized cases of open tuberculosis are a serious menace in general hospitals.

### Standards for the Maintenance of Nurses' Health

The Ministry of Health Interdepartmental Committee on Nursing Services (Interim Report, 1939) discussed the question of the care of nurses' health and the provision of medical attention, in the form both of medical inspection and of attention during sickness. The report stated that medical inspection of entrants seemed to be general, though not universal, but that apparently in most hospitals no further inspection was made during training. It recommended the practice of thorough medical examination, with a chest radiograph, four times during the training period and again on appointment to the staff.

Pietzcker (1937) tabulates the international figures derived from her questionnaire on the subject of medical inspections, chest radiography, immunization, etc. Her figures for seven countries, including Great Britain, are shown in Table III.

At the 1937 Congress of the International Council of Nurses Lambie of New Zealand emphasized the need for standards of health and service which could be followed in every training school. The following measures which she proposed are in many ways similar to those of the numerous American Health Programmes for Nurses, of which Fuld (1937) and Davies and Frost (1940) have described examples, and to the recommendations set out more recently in this country by the King Edward's Hospital Fund for London (1943) and by Court (1943).

1. General Health Measures.—(a) Adequate living conditions, individual rooms and good recreation-rooms. (b) Three balanced and regular meals each day or night. (c) A carefully sidered programme of work, recreation, outdoor exercise, and sleep. (d) Regular leave and off-duty time.

2. Physical Examinations, etc.—(a) Medical and dental examinations on entry. (b) Radiograph of chest on entry. (c) Diagnostic skin tests, and immunization against diphtheria and enteric fevers. (In some hospitals immunization against smallpox and scarlet fever is also the rule.) (d) Repetition of medical and dental examination, and of chest radiograph, at intervals of 6 to 12 months. (e) Repetition of tuberculin test six-monthly in negative reactors. (f) Monthly weight chart for each nurse. (g) Correction of physical defects, if any.

3. Care of Sick Nurses.—(a) Opportunity to report sick at any time without fear of rebuke. (b) Encouragement to report minor disturbances of health immediately. (c) Direct access to medical advice. (d) A properly equipped minor ailments surgery. (e) Adequate sick-room accommodation.

4. Aseptic nursing procedures which should be carried out in the light of modern bacteriological information and which should be kept up to date with new advances.

5. Education of the nurses as to the value of a health programme, and the development of their interest in preventive medicine and "positive health."

6. Research as to the effects of hospital service upon the health of nurses, as shown by the incidence, nature, and predisposing causes of their ailments.

TABLE III.—Figures regarding Medical Examination, Immunization, etc., of Nurses in Various Countries. (From Pietzcker, 1937.)

Country	G.B.	U.S.A.	Canada	New Zealand	France	Norway	Rumania
No. of hospitals taking part	20	27	38	26	31	9	4
Percentage of examined nursing students rejected on grounds of ill-health	7	5	8	8	5	22	8
Percentage of hospitals giving x-ray examination to all nursing students	—	71	95	73	87	78	100
Percentage of hospitals giving immunization to nursing students against							
Smallpox	85	82	84	—	74	—	75
Diphtheria	25	85	84	—	74	11	25
Scarlet fever	15	44	47	—	97	25	50
Enteric fevers	—	85	74	50	—	33	—
Tuberculosis	—	—	—	—	—	—	—
Percentage of hospitals requiring or providing dental examination	95	89	90	100	71	67	75
Percentage of hospitals giving medical examination during first year to all nursing students	45	89	84	77	94	90	100
Percentage of hospitals giving medical examination; also later as a rule	0	85	58	62	52	44	100
Percentage of hospitals checking weight of nursing students monthly or quarterly	5	85	82	100	77	22	100

### Discussion

While there has been considerable interest in the occurrence and prevention of tuberculosis among nurses, little information is available concerning the nature and incidence of other illnesses. Certain American workers have found that student nurses are more subject to illness than college girls; and Diehl (1935) observed that this higher morbidity rate was mainly due to cutaneous and upper respiratory tract infections. This fact he attributed to the nurses' occupational hazards; and data collected by the National League of Nursing Education in the United States confirm his findings. Its survey indicated that student nurses on their clinical course had a higher sickness rate than those who, on their preclinical course, were not in contact with ward work; and, further, that among nurses undertaking duties where exposure to infectious diseases was greatest—as on the paediatric and communicable diseases service—sickness rates were higher than elsewhere.

The figures presented here from the records of University College Hospital for 1936 to 1938 confirm those of Branson

of St. Bartholomew's Hospital for an earlier date, in that nearly 60% of all attacks of sickness were due to pyogenic and respiratory tract infections. In both series sepsis took first place, both for number of attacks and for number of days of sickness. In this they differed from the figures of Rhoads and Afremow and of Court, who found that respiratory tract infections were the main cause of absence through sickness. The high rate of whitlows among nurses is worth mentioning. Branson found that this condition was responsible for a considerable majority of the cases of sepsis; and at University College Hospital it accounted for 11.6% of all attacks of illness and of all days lost through sickness. Spooner (1941) observed that septic fingers and hands among the nurses of a surgical ward seriously interfered with the work; and the present investigation was, in fact, encouraged by the frequency of whitlows among the nurses of a war-wounds ward.

The many cross-infection studies of the last few years have shown that nurses not infrequently acquire infections from their patients. Okell and Elliott (1936), for example, working in an ear-nose-and-throat hospital, found that nurses were implicated in nearly half the ward outbreaks of haemolytic streptococcal infection, and that the nurses' infections were associated with the same types of haemolytic streptococci as those which cross-infected the patients. While aseptic techniques have been regarded mainly from the angle of protecting the patient from the nurse, their function is dual: they should also serve to protect the nurse from the patient. This aspect of nursing technique has been stressed more in sanatoria for tuberculosis than in other types of hospital.

The present scanty information regarding the predisposing causes of the illnesses to which nurses are prone indicates that there is scope for further investigation on the matter. That infection rates may vary considerably from one group of nurses to another within the same hospital is to be seen from the figures tabulated by Court. He found, for example, that respiratory infections during 1942 varied from a 23% incidence among student nurses to a 68% incidence among assistant nurses, and that, while septic fingers developed among 13% of the latter group, they occurred among only 1.6% of the trained staff. It would be interesting to know if the operating-theatre staff, who are protected by masking, gowning, and a meticulous aseptic technique, have a more favourable health record than nurses on ward duty.

To gain more knowledge of nurses' sicknesses and their causes careful recording and analysis would be required with regard to age, years of service, ward assignment, nature of duties, and day and night schedule; and also to the clinical character and duration of each sickness, and the length of sick-leave. In addition, accurate records of the number of nurses at risk in each circumstance would be needed for the determination of the comparative sickness rates. An investigation of this kind should throw light on the reasons for the generally recognized high rate of skin and respiratory tract infections among nurses; and the information gained would be a necessary preliminary to the introduction of special measures for their prevention.

### Summary

An analysis is made of the nature and incidence of sickness among the nursing personnel at University College Hospital during the three years 1936 to 1938. More recent figures could not be used because of the various administrative changes brought about by the war.

Among the causes of sickness and days lost through sickness, pyogenic infection took first place, closely followed by upper respiratory tract infection. The two infections taken together accounted for nearly 60% of all sicknesses.

Whitlows were responsible for 40% of the pyogenic infections, and for 11.6% of all sicknesses and of all days lost.

Common infectious diseases were important for the number of days lost rather than for the number of nurses involved.

Of 22 long illnesses (more than 100 days), 6 were due to tuberculosis (5 pulmonary and 1 of the ileum); 7 other long illnesses were caused by complications resulting from respiratory infection.

The importance of nurses' sickness in relation to cross-infection problems is discussed, and stress is put upon the need to investigate further the predisposing causes of infection among nurses, as a preliminary to prevention.

I am indebted to the Matron, Assistant Matron, and Home Sister of University College Hospital for their assistance with this work to the Nursing Committee of the hospital for permission to publish the figures; to Prof. A. A. Miles for his help and advice; and to the Medical Research Council for a personal grant.

### REFERENCES

- Branson, W. P. S. (1933). *St. Bart's Hosp. Rep.*, 66, 125.  
Court, D. M. (1943). *Lancet*, 2, 753.  
Davies, E., and Frost, H. (1940). *Amer. J. Nurs.*, 40, 1.  
Diehl, H. S. (1935). *Ibid.*, 35, 1057.  
Fuld, L. F. (1937). *Med. Rec.*, 146, 339.  
King Edward's Hospital Fund for London (1943). Memorandum on the Supervision of Nurses' Health, London.  
Lambie, M. J. (1937). Congress Papers: International Council of Nurses. Ministry of Health Interdepartmental Committee on Nursing Services (Interim Report), 1939, H.M.S.O., London.  
National League of Nursing Education, New York City (1938). *Study of the Incidence and Costs of Illness among Nurses*.  
Okell, C. C., and Elliott, S. D. (1936). *Lancet*, 2, 836.  
Pietzcker, D. (1937). Congress Papers.  
Rhoads, P. S., and Afremow, M. L.  
Soper, W. B., and Amberson, J. B.  
Spooner, E. T. C. (1941). *J. Hyg.*, 41, 320.

## CYCLOPROPANE FOR DENTAL SURGERY IN CHILDREN\*

BY

K. B. PINSON, M.B., Ch.B., M.R.C.S., D.A.  
*Anaesthetist to the Manchester Royal Infirmary*

School-children, a few younger pre-school children, and expectant and nursing mothers attend the Stretford Borough clinics for dental treatment. Roughly 65% of those offered treatment accept it. It being desirable that this percentage should rise, any necessary anaesthesia should be as pleasant and as free from distress as possible. I am indebted to Mr. Ronald Bradbury, L.D.S., now serving as a dental surgeon in the Army, to Miss A. M. Paterson, L.D.S., and to Miss P. E. Pendlebury, L.D.S., for their co-operation. A short account, by Mr. Bradbury and myself, of the first 75 cases with cyclopropane appeared in the *British Dental Journal* on June 3, 1943, and these cases are included in this series because, although the method was afterwards altered somewhat, the essence of it remained the same. Follow-up observation was impracticable, and so of only a small proportion is there any information as to progress at home.

The method is simple, and so is the apparatus required. This simplicity is made possible by the slowness with which CO<sub>2</sub> accumulates in a breathing-bag in the case of children, so that its removal by soda-lime absorption, which generally is a *sine qua non* in cyclopropane anaesthesia, is not necessary. For older children and longer operations than the extraction of teeth the method is thus unsuitable. The technique is almost rule of thumb. Cyclopropane is a most potent gas, but if given by an anaesthetist of experience there appears to be only one risk which he will have to bear in mind. As will be seen, its origin is salivation. Other anxieties are conspicuous by their absence. In roughly a quarter of these cases the administration was by students.

Cyclopropane recommends itself for this work because it combines the following desirable qualities, variously present in other agents: an attractive induction, rapid and smooth; ample time and ample depth of anaesthesia; freedom from untoward effects such as blueness, breath-holding, movement, spasm, difficulty of administration owing to mouth-breathing or attainment of a correct mixture or insufficiency. It also has one advantage over all others—the degree of jaw relaxation. Early relaxation of muscles is a characteristic of cyclopropane, but of the jaw muscles it is a peculiarity. As a rule the mouth gag is not used—a benefit by no means trivial. There are disadvantages, however, as will be seen, and they appear in the after-effects—chiefly sickness. Comparison has to be made with other satisfactory systems—with vinesthene, and with continuous nitrous oxide with oxygen, trilene, or vinesthene. There are cases for which cyclopropane is preferable to any of these.

\* A survey of the first 500 consecutive cases at the Borough of Stretford School Dental Clinic.

## Description of Apparatus

The apparatus used comprises: (1) a holder for the cyclopropane cylinder; (2) a measuring device; and (3) a breathing-bag, connected to a nose-cap by as short a length as possible of wide-bore tubing. There are no valves. For (1) any convenient stand or place to fix the cylinder yoke is suitable: we have a separate disused  $N_2O$  apparatus. (2) The very satisfactory measuring device we use consists of a small rubber bag, fixed adjacent to the cylinder, which holds rather over a pint, and which is filled direct from it. Between this and the rebreathing-bag is a Higginson syringe, by which its contents are delivered as desired into the breathing-bag. An oxygen cylinder with a fine adjustment or a reducing valve is also connected to the breathing-bag. Three of the small bagfuls is the usual consumption of cyclopropane. (3) The breathing-bag is of the common two-gallon capacity, and its mount is screwed to the chair as near to the patient's head as possible. About a foot of flexible wide-bore tubing connects it direct to the nose-cap.

## Mode of Use

This simple apparatus is very straightforward in use. The child is seated in the chair and the nose-cap quietly applied. As he is engaged in conversation the breathing-bag becomes one-third filled with oxygen. He is now told to keep his mouth closed for a minute, as it is easier to breathe through the nose. This he finds unobjectionable, because there is only oxygen in the bag. The measuring-bag is now filled, and the contents pumped, slowly at first, into the breathing-bag by squeezing the ball of the syringe, preferably during expiration. The method is a closed one, so that mouth-breathing is to be avoided almost from the start.

Cyclopropane is easy to inhale, is not resented, and rarely gives rise to any movement, much less to struggling or spasm. Sleep comes quietly and quickly, so the second and third pints follow the first without pause, and can be pumped more rapidly as the child becomes unconscious. Perhaps half the contents of the bag will be oxygen, and more can be added, although as a rule little is lost (through mouth-breathing) during the extractions. The colour remains perfectly good. Work is begun as soon as the patient is under and the jaw relaxed. No change is made; the nasal breathing continues, and the effect of gradual accumulation of  $CO_2$  is offset by respiratory depression.

Table showing Analysis of First 500 Cases

A. Number	B. Dangers encountered	C. Difficult Cases (or not Completely Satisfactory)	D. Salivation	E. Sick	Felt Sick
500 cases, 1 to 91 and No. 109: face-piece over mouth and nose. Remainder by method described	1 (No. 43)	25 (9 due to salivation)	37	In chair, 20; in recovery room, 84. (27%) (6 were noted as having had food)	7
F. III After-effects (Other than Vomiting and Reports from Home)	G. Serious After-effects	H. Reports from Home	I. Ages	J. Special Cases	
18	None	(Very incomplete) 3 quite well a ter 4 sick or poorly 5 at school next day 1 off school 5 days 1 .. 3 weeks	1 to 5 (75) 6 to 8 (196) 9 to 11 (126) Over 11 (78) Not noted (25)	3	

K. Consumption and Cost.—Gallons, 120; cases, 299; gal./case, 0.42; pints/case, 3.3; case/gal., 2.4; cost per case, at 2s. 6d. per gal., 1s. 0½d.

Temporary or partial obstruction does not matter, as oxygenation has been perfect; neither does it result in heaving efforts to breathe. Quietude and jaw relaxation are, in fact, noteworthy. With big children,  $CO_2$  begins to mount after a minute or two and causes deeper breathing, and consequently mouth-breathing and loss of gases from the bag. On only a few occasions, however, have more  $O_2$  and cyclopropane been added.

At the end of the extractions the nose-cap is removed. Colour, breathing, and condition alike are good, and recovery of consciousness takes only a minute or so, though it is not

so quickly complete as in other eligible methods, and it has been taken the child will vomit very soon. The child does not usually walk from the room, but are carried. They are able, however, to sit up over a basin and wash their mouths out with water.

From the point of view of the dentist it is perhaps the most satisfactory method of all for those cases to which it is suited—that is, to children up to 12, or for work not taking more than three minutes or so. Also, from the point of view of the administrator it is very safe, and is free from troubles and anxieties. From that of the patient, however, while induction is equally as acceptable as that of other means—perhaps more acceptable—the after-effects sometimes fall short of what is desirable.

## Remarks

(B) The patients sometimes secrete profusely, and the respiration is always rather depressed; if saliva is allowed to trickle down the larynx, that and the consequent laryngeal spasm, and the enfeebled breathing effort, may bring about asphyxia. The treatment, apart from prevention, would be to invert the child (so as to empty out the saliva) and blow into the lungs a little oxygen or air—e.g., by mouth-to-mouth insufflation. This procedure is well known to anaesthetists, is simple, is quite efficacious, and should not be delayed. It would be well if it were better known to the occasional anaesthetist. Such was the case with No. 43. More cyclopropane was given immediately afterwards and the extractions done. This patient slept afterwards for a while, but was not sick.

(C) Apart from those cases in which salivation caused some obstruction or blueness, three gave incompletely satisfactory results owing to mouth-breathing during induction. Two coughed, one of whom—6 years old and attending the open-air school on account of his chest—coughed almost incessantly before, during, and after induction. He became blue at one time. In seven the anaesthesia, though sufficient, was poor. Two were restless or struggled for a few moments, and in three the jaw was tight. One was a poor colour and one was very sick. In no case was the work left uncompleted, and in none was any pain experienced. It should be noted that some of the cases were managed by students.

(D) Regarding salivation, a little experience overcomes any difficulty.

(E) Cases of vomiting were carefully noted, though doubtless some were missed. Generally it was soon over.

(F) Ill after-effects were of a minor character. The patients so affected include five who were irritable or rough for a short time before quite coming round, four who were drowsy, four who cried, two who were a bad colour or pale, two who felt poorly, one who was faint, and one who coughed a great deal. One of these stayed two hours before going home; the rest soon recovered. One had had no ill effects after cyclopropane three weeks before.

(H) With regard to school attendance afterwards, there was always a proportion, after any anaesthetic, who did not go back for a few days.

(J) Under this head, one was an imbecile girl aged 10 who took the anaesthetic without difficulty and had no ill effects. Another was a bad asthmatic—a small boy attending the open-air school. He was a mouth-breather, was not well under, and was off school for five days afterwards. Cyclopropane was chosen as being most suitable for him. The third was the boy of 6 who coughed almost without stopping, and so was difficult.

It is not easy to convey an impression of how the administration goes or how the children react. In general, a cap over the nose is less alarming than a face-piece which covers both nose and mouth. In either case we do not often have any trouble, and crying is uncommon. With few exceptions the children behave very well indeed. Cyclopropane induction is notably smooth, and a sleepy feeling overcomes them very soon. Being unhampered by valves, etc., and the fact that they can talk and that there is no hurry, help them to be confident. The method is thus rather easier to manage than others. Of preparation beforehand there is none beyond abstinence from food. We do not give atropine.

## Summary

A description is given of a new method of administering cyclopropane for dental extractions in children and of the apparatus employed. A detailed review of the first 500 cases is made. The conclusion is advanced that it is a simple and safe method, advantageous to the dentist and giving full satisfaction in all respects except for undesirable minor after-effects, and that the incidence of vomiting is rather high. The cost is a little more, but still is comparable with that of other systems.



## EARLY SECONDARY REPAIR OF COMPLETE TEARS

BY

PERCY MALPAS, F.R.C.S., F.R.C.O.G.

*Honorary Surgeon, The Women's and Maternity Hospitals,  
Liverpool*

There is still a general lack of agreement as to when complete tears that have broken down after immediate suture should be repaired again. In most of the textbooks the point is evaded by the statement that when a primary repair is done within 24 hours of delivery a successful result is usually obtained. While there is no doubt that this is true if the repair has been carefully done under good operating conditions, many do break down within the fortnight under the conditions of general practice. This is shown by the frequency with which patients with complete tears come up for operation months or even years after delivery. For instance, during the last five years 40 of such cases have been operated upon in the Women's Hospital, Liverpool. In each of these an immediate repair had been unsuccessful; healing by second intention had been allowed to take place and the necessary repair deferred until the patient was driven to hospital by the inconvenience of the incontinence or freed from the responsibility of the care of the baby to have time for the operation. Most of these late operations would have been avoided by the procedure here suggested.

The recommendation given by most authorities is that a secondary repair is best deferred for at least three months after delivery, until the parts are clean and involution has taken place. Against such a course there are, however, two very real objections. In the first place, the woman is left most uncomfortable at a time when she needs all her energy. In the second place, involution, though bringing certain advantages, entails the great disadvantage that both the fornix muscle and the mucous surfaces retract and undergo permanent shortening, with the result that undue tension is needed to reapproximate the tissues. The reason usually given for deferring the re-suture is that the raw surfaces are granulating and infected, and union therefore is not likely to be obtained. Smellie (1758) describes one such case:

"I was called by a midwife to a woman on the fifteenth day. The Perinaeum, Vagina and Rectum were tore into one about the length of two inches which prevented the retention of the faeces. The edges of the lacerated parts were beginning to skin over. I attempted with scissors to pare the edges, as in the hair lip; but could not possibly hold the parts so as to effect this purpose. I then armed a lancet, and with the point scarified them and with great difficulty made two stitches through the Vagina and Rectum and two in the Perinaeum; but in two days this brought on a large inflammation and the stitches all tore out. The parts digested and skinned over but did not cement or join together; however they contracted in such a manner that in three months after she could retain her excrements."

There is no doubt that these cases do look at first sight most unsuitable for early repair. The raw surfaces are covered with granulations, the tissues are friable so that the sutures tend to cut through, and the whole area is heavily contaminated with faeces.

On the other hand, and despite these objections, early re-suture is a practicable procedure; in the six cases I have seen during the past two years it has been employed, and proved a success. The operative difficulties are easily offset by the advantages gained by doing the operation at once.

Four of the patients had been delivered with forceps by their own doctors in nursing homes. The other two had been delivered with forceps in hospital by residents. In every case primary repair had been undertaken at once but had broken down within a week of delivery—in five of the cases completely, and in one partially so as to leave a recto-vaginal fistula. Two of the cases were pyrexial owing to a uterine infection.

In each case a secondary repair was undertaken as soon as it could be arranged—one 7 days after delivery, one 10 days, one 13 days, one 15 days, one 3 weeks, and one 4 weeks. In the two pyrexial cases operation was delayed

until the acute uterine infection had subsided. During the few days before operation the raw surfaces were kept as clean as possible, but otherwise no special treatment was given. Five of the repairs were done personally; the sixth done by Miss M. Mayeur, F.R.C.S., on one of the hospital cases.

Every case healed well and gave no more trouble than the usual complete-tear repair. Complete control and healing were established within two weeks of undertaking the repair. The convalescence of one of the pyrexial cases was complicated by repeated secondary haemorrhages from the uterus. Despite the patient's poor general condition and the need to treat the haemorrhage by firm vaginal packing, the perineum healed normally.

The operation calls for no special technique, although good operative conditions are essential. It is neither possible nor desirable to coapt the skin of the perineum very closely, with the result that the appearance of the perineum at the close of the operation is not artistic. No special attempt need be made to clear the granulations from the raw surfaces, but most are in fact cleared away by the manipulations employed in defining the rectal mucosal edges and the ends of the anal sphincter. Great care must be taken to free the rectal and anal mucosal flaps completely from the underlying tissues. This should be done so freely that the two edges of the mucosa fall into apposition even before the sutures are inserted. As in all these repairs, special care must be taken to close the upper end of the rectal tear. After dealing with the mucosa the perineal body is repaired and the sphincter restored in the usual way. Little or no trimming should be done, even at the expense of leaving an irregular suture line. Interrupted stitches should be used throughout—No. 2 plain catgut for the rectum and deep tissues, silkworm-gut for the perineal skin. A short split-tube rubber drain is an advantage, left in the recto-vaginal space and brought out through the centre of the perineum, and remaining in position for two or three days.

While the object of this note is to draw attention to the possibility of early re-suture, reference may properly be made to the likely causes of the failure of the initial repair. The immediate technical fault in most of these cases is certainly the failure to suture the upper end of the mucosal tear. When the repair breaks down the disruption usually takes place from above downwards; first a recto-vaginal fistula appears, and then the whole wound "gives," the skin perineum last. There is no doubt that this primary failure in technique is due to the difficulties caused by poor operating conditions, uterine haemorrhage obscuring the field, and perhaps the strain of the antecedent forceps delivery. Many, if not most, of the failures would be avoided if it were the rule to defer the primary repair of complete tears for 12 to 24 hours after delivery, until better conditions and perhaps better assistance can be obtained.

### REFERENCE

Smellie, W. (1758). *Collected Cases*, 2nd ed., 3, 320, B. Wilson, London.

## Medical Memoranda

### A Case of Compressed-air Illness

Compressed-air illness, more commonly known as "bends," is a disease familiar to all divers, airmen, and medical officers associated with this work. The present great increase in altitude flying and underwater work has revived interest in this formerly limited industrial disease. Briefly, it has its origin in a dangerous and excessive release of pressure of air, causing the tissues to become supersaturated with nitrogen, bubble formation to occur. These bubbles may appear in circulating blood and cause pulmonary embolism; in the vessels of joints or muscles, causing the most common syndrome of "diver's bends"; or in the central nervous system, causing coma, confusion, cerebral palsies, and various types of myelitis with paralysis of limbs and incontinence. Symptoms vary enormously, depending on the site of formation or lodgment of the bubble. As fat dissolves far more nitrogen than water, the occurrence of bubbles in the central nervous system is not

surprising event. Itching of the skin, which is often encountered after decompression, is also ascribed to minute bubbles in the subcutaneous fat. Skin rashes occur, and may be due to minute emboli in the cutaneous vessels.

Ordinary "bends" are severe boring pains in the vicinity of the large joints and the small joints of the hands and feet, particularly in persons suffering from old trauma or disease. This is by far the most common form of the disease, and, although causing great pain, it in no way endangers life. These pains have been ascribed to bubble formation in the ligamentary and tendinous insertions, embolism in the vascular bed involved in infective osteomyelitis, or bubble formation in the nerve trunks or central nervous system, causing referred pain. Itching of the skin may also be due to more distant neurological events.

At present, therefore, various paralyses are known to be due to interference with the motor centres or motor path, but sensory disturbances of nervous origin, apart from blindness and deafness, are not encountered in the literature. The following case is thus of great interest.

#### CASE RECORD

A petty officer of the Royal Navy, aged 38, weight 174 lb., of lean athletic build, acted as attendant to an experimental subject at a pressure of 40 ft. of sea-water (18 lb.) for two hours. He was breathing air the whole time, and wore no respiratory apparatus of any kind. He "surfaced" (returned to atmospheric pressure) in one minute, no stops being necessary according to the Admiralty decompression table (after the late Prof. J. S. Haldane).

Five minutes after "surfacing" a pain developed in the top left premolar. It was a severe pain with an unusual emotional content. This was at first thought to be due to a sealed cavity under a stopping of the tooth or to an abscess cavity at the root. The subject was immediately recompressed to 18 ft. of sea-water, when instant relief of pain occurred. He was returned to atmospheric pressure in 30 minutes. After this, pain, although still present, was less severe. He then went to lunch, during which the pain increased in severity and anaesthesia of the upper left gum and teeth developed, the posterior tooth and gum being first involved, and anaesthesia spreading forward and ceasing at the midline. The pain remained localized to the premolar. It was now apparent that a bubble had formed, involving the second branch of the trigeminal nerve. Appropriate subcutaneous anaesthesia was not present.

Immediate recompression to 12 lb. was carried out, and relief was at once obtained. Decompression at the rate of 8 minutes per lb. was instituted. At 5 lb. the pain in the tooth returned, but was not severe, and decompression continued. At 3 1/4 lb. anaesthesia returned, followed by a most agonizing neuralgia in the whole of the distribution of the second branch of the trigeminal nerve. The patient sweated, bit on his handkerchief, and was writhing with pain. The tender points of Vallex (temporo-malar and infraorbital) were present. Immediate recompression to 13 lb. was carried out, with complete disappearance of symptoms. Decompression at a slower rate of 12 minutes per lb. was then performed, and the patient "surfaced" symptomless, and has remained so ever since. Tenderness had also completely disappeared.

#### COMMENT

There is no previous history of trigeminal neuralgia, ear, nose, or throat infection, or dental caries. He suffers sharp dental pain in this particular premolar if it is exposed to extremes of temperature, and there is slight enamel erosion at the base near the gum. Recent dental examination revealed no other disease.

The points of interest in this case are: (1) The occurrence of bubble formation after exposure to such shallow depth. (2) The occurrence of bubble formation in a diver who has been exposed to varying degrees of pressure several times a week over a period of a year and a half without symptoms. In this time it had been ascertained that he was apparently extremely resistant to "bends," but the long period of pressure work may well be a contributory factor to the attack described. This case is a good example of how compressed-air illness may occur when and where it is least expected. (3) The occurrence of bubble formation definitely involving a sensory nerve. (4) The attack of tic douloureux, involving the whole distribution of the second branch, suggests very strongly the involvement of the Gasserian ganglion, and adds weight to the previously tentative opinion that many cases of "bends" in joints may be due to bubble formation in the sensory ganglia. The occurrence of anaesthesia in a limited zone in association with severe neuralgia is an interesting problem for neurologists. (5) Hard work of any group of muscles, at pressure, is well known to predispose to "bends" in that region, and in this case the attendant sang loudly and uproariously for over an hour, for the supposed edification of the subject. Whether or not this explains the site of the disease is problematical, but this may be the first reported case of "operative bends."

K. W. DONALD, MB., B.Chir.,

Sure, Lieut.-Cmdr., R.N.

Medical Officer in Charge of Admiralty  
Experimental Diving Unit.

## Reviews

### PICTORIAL AIDS TO ANATOMY

*Illustrations of Regional Anatomy.* By E. B. Jamieson, M.D. Fifth Edition. Section I: Central Nervous System (50 plates). Section II: Head and Neck (64 plates). Section III: Abdomen (44 plates). Section IV: Pelvis (38 plates). Section V: Thorax (32 plates). Section VI: Upper Limb (42 plates). Section VII: Lower Limb (52 plates). (Bound volume 75s. plus 10d. postage.) Edinburgh: E and S Livingstone, 1944.

That the fifth edition of Dr. E. B. Jamieson's *Illustrations of Regional Anatomy* should have appeared during wartime so soon after its predecessor is undoubted evidence of its popularity, and the care which has been taken both by the author and by the printers to obtain clarity and accuracy in the figures and pointer legends is manifest to anyone who has to deal with this kind of work. In these days, when it is of the utmost importance that time should not be wasted in unnecessary efforts, and that the eye-strain incurred in the identification of particular reference letters in a legend should be avoided, the gain arising from the use of clear pointer legends is obvious. Although from the standpoint of operative surgery nothing can replace the basic knowledge of anatomy gained in the dissecting and post-mortem rooms, illustrations such as those in the work we are considering are manifestly of great value to the student in a rapid revision of the whole field of anatomy just before an examination, and these clear-cut coloured figures admirably fulfil this purpose. There are, however, a few points which call for comment: thus in Plate 271 (Lower Limb) the pointer, which should indicate the groove behind the fossa for the attachment of the tendon of the popliteus muscle, is directed to the flat surface on the lateral condyle of the femur, immediately in front of the fossa, and in the illustration there is no indication of the groove itself. A note of warning is also necessary in order to counteract false impressions which may arise from a too general simplification of the picture by omission in certain cases of the shading which is required to indicate a difference in plane between the two surfaces, more especially in the representation of convex or concave surfaces and parts which, owing to the obliquity of the object depicted in relation to the surface of the paper, it is necessary to distinguish by variations in tone between a more distant and a nearer part. An example of this is seen in the postero-medial view of the ankle (Lower Limb, Plate 38), in which the more distant first metatarsal base and the medial cuneiform appear to be on the same plane as the nearer posterior surface of the calcaneus, the impression given being heightened by the sharp contrast between the unshaded dead white of the base of the first metatarsal and the black background. Apart from these purely technical considerations, however, the main purpose of the work, issued as it is in separate sections of handy size, is well fulfilled.

### MEDICAL PARASITOLOGY

*A Manual of Medical Parasitology.* By Clav G. Huff, Professor of Parasitology in the University of Chicago. (Pp. 88; illustrated, 9s.) Chicago: University of Chicago Press; London: Cambridge University Press.

This is a laboratory guide to medical parasitology intended for use in practical classes. It describes with illustrations the life-history of the various parasites and insects involved in the production of tropical diseases. The system of classification in the three main groups under protozoology, helminthology, and entomology is dealt with in sufficient detail for the student's guidance. There is a final chapter on staining methods and other procedures to be adopted for the discovery of parasites and the diagnosis of infections. The illustrations on the whole are quite good, though one wonders why the cyst wall of *Entamoeba histolytica* and *E. coli* have such irregular outlines while that of *Iodamoeba bütschlii* (referred to as *I. williamsi*) is not visible at all. The same remark applies to the cyst wall of *E. nana*.

There is a coloured plate of malarial parasites. This is excellent, save for the Schueffner dots, which have an unfamiliar appearance. It is perhaps surprising that a plate illustrating the haemoflagellates is conspicuous by its absence. Apart from these details the book will serve a useful purpose, and will be an excellent guide to have beside one when working with the microscope in the laboratory.

## OTO-RHINO-LARYNGOLOGY

*Office Treatment of the Nose, Throat and Ear.* By Abraham R. Hollender, M.Sc., M.D., F.A.C.S. (Pp. 480; illustrated. \$5.00 post paid.) Chicago: The Year Book Publishers, Inc. 1944.

*The 1943 Year Book of the Eye, Ear, Nose and Throat.* The Eye: Louis Botham, M.D. The Ear, Nose and Throat, by Samuel J. Crowe, M.D. With the collaboration of Elmer W. Hagens, M.D. (Pp. 580; illustrated. \$3.00.) Chicago: The Year Book Publishers.

The author of *Office Treatment of the Nose, Throat and Ear* has devised a highly artificial classification of diseases into two kinds, of which the nature is evident from the title of his book. He has, however, succeeded very well in giving a practical account of the treatment which may be employed without confining the patient to bed immediately afterwards, but it is not surprising that on some occasions the dividing line becomes rather blurred. Naturally the major operations do not come under review, but he says, for example: "To-day it would sound like anachronism to speak of tonsillectomy as an office procedure, yet one may visualize it as such when the usual hospital facilities are not available." It is the custom in the U.S.A. to carry out much more treatment in the office, which is correspondingly equipped, than in the simpler consulting-rooms and out-patient departments of Great Britain. Making allowance for this it must be recognized that he describes much that it would not be wise to do in an ordinary consulting-room. There is great value in the emphasis this book lays on the large amount of treatment which can usefully be given by prescriptions, injections, physical therapy of various sorts, and very minor surgical manipulations without resort to the major surgery which is apt to fascinate the exponents of what is largely a surgical specialty. Other authors are quoted freely, especially on the endocrine and nutritional disorders to which Dr. Hollender attaches great importance. Some of the treatment is surely out of date, as exemplified by the picture of a lady wearing a dog collar to which two electrodes are attached for the cure of hysterical aphonia. This malady can be treated in the office without this apparatus, but generally Dr. Hollender is a safe guide, and he shows that more can be done by medical and minor procedures than is always appreciated.

War conditions have imposed slight alterations in the production of the *Year Book of the Eye, Ear, Nose and Throat*, but these are scarcely perceptible without direct comparison with a previous number. Except for a slight fall in the sharpness of the illustrations the quality of the contents remains unimpaired, and there will be found admirable summaries of current literature with the usual illuminating comments by the editors, who all continue their excellent work. The need for these summaries is greater than ever during the present period of difficulty in the distribution of scientific literature. They are the more valuable because the editors, who know the literature of their subjects besides being men of great practical experience, are able in a few lines to indicate the value of a paper, whether it embodies a valuable idea, whether it is just ephemeral, whether it reviews something that has already been tried and found wanting, or whether it contains some fallacious notion. Chemotherapy finds a prominent place in both the main sections. Both penicillin and the sulphonamides are the subject of much observation and experimentation. There is a curious misprint in a paper on glossopharyngeal neuralgia: the digastric is called the "digestive" muscle, but this is only noticeable on account of the laudable rarity of such errors.

## Notes on Books

*Spectrophotometry in Medicine*, by L. HEILMEYER, translated by A. Jordan and T. L. Tappell, is published in London at 30s. by Adam Hilger. The content of this monograph is indicated by the first sentence of the author's foreword: "The present monograph has been evoked by the need for an exact physical definition of the colours of body fluids and body pigments." The translators have supplemented the original (1932) description of instruments with an account of those now used in this country, and the original German symbols have been replaced by others more commonly used here. Starting with the theory of absorption spectrophotometry, the author goes on to describe selected apparatus and methods in some detail. The bulk of the book is devoted to detailed description of the absorption curves of whole blood, haemoglobin and its derivatives

and breakdown products, serum, urine, bile, ascitic fluid, cerebrospinal fluid. Since under these headings both normal and pathological fluids are considered, as well as pigments of urine due to drugs, the book provides a comprehensive survey of the curves of all pigments found in association with the human body. It should be of great value to those with the facilities for carrying out spectrophotometric analyses on clinical material. It is unfortunate that more than ten years have elapsed before this useful translation has become available.

*Dental Histology*, by JAMES AITCHISON and JOHN S. DICK (J. & Balc Medical Publications; 18s.), is a small book compiled from lecture notes and will be most useful to the student when making his own slides and during revision for examinations. There are some excellent photomicrographs, but these would be of more guidance if they could be produced in colour and augmented by diagrams illustrating the structure of the dental tissues.

## Preparations and Appliances

## THE ROCKER WALKING IRON

Capt. G. E. FOSTER, M.D., C.M.(McGill), graded surgeon R.A.M.C., writes from the British Military Hospital, Bermuda

A rocker walking iron is described by Major T. T. in the *British Medical Journal* (July 3, 1943). I have used, every satisfaction, a different type, as described below:

## Description of Apparatus

- (1) An iron strap, 30 in. x 1 in. x 1/8 in. to 3/16 in., is bent in the shape shown in Fig. 1. Heating facilitates this, but is not essential.
- (2) The rocker surface is covered to prevent slipping. A piece of old bicycle tyre is suitable, and may be laced on. Alternatively, a leather strap may be riveted on.
- (3) An unpadded plaster cast is applied in the usual way. The posterior slab should be substantial (15 to 18 layers).
- (4) When the cast has hardened, a single plaster bandage suffices to secure the iron (Fig. 2A).
- (5) The well foot should be fitted with a built-up wooden sole screwed on to a canvas shoe in order to equalize the leg length (Figs. 2B and 3).



FIG. 1

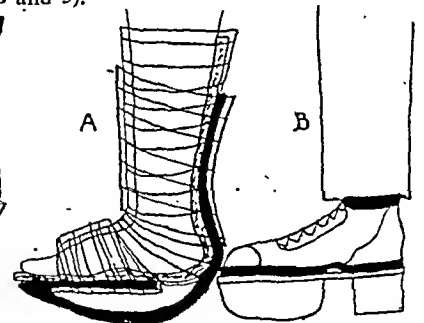


FIG. 2

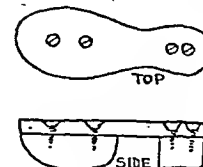


FIG. 3

Fig. 1.—Rocker iron fitted with rubber tread (from old bicycle tyre).

Fig. 2.—(A) Rocker iron incorporated in plaster cast. (B) Built-up wooden sole attached to canvas shoe on well foot.

Fig. 3.—Wooden sole, top and side view.

## Advantages

- (1) The rocker, as stated by Major Stamm, unquestionably "ensures a natural heel-toe action in walking."
- (2) The type I describe needs no bolting to a sole plate, and the long upright part distributes the weight over more of the cast as well as stabilizing the rocker. The appliance remains firm and secure after several weeks' service, and the same iron may be used repeatedly.
- (3) The built-up sole on the well foot greatly facilitates walking.

This particular rocker iron has been used in the U.S.A. and Canada for several years. The type of built-up sole I mention is standard in some U.S. service hospitals.

My thanks are due to Major S. G. M. Lynch, R.A.M.C., Senior Medical Officer, Bermuda Command, for permission to forward this paper.

## BRITISH MEDICAL JOURNAL

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## MANAGEMENT OF THE ACUTE HEAD INJURY

This war has so far yielded a much higher proportion of closed head injuries<sup>1</sup> than was expected, and as a consequence emphasis has been placed on the medical aspects of their management. In the field the neurosurgeon is faced with the immediate repair of soft tissue, and a series of papers by Ascroft,<sup>1</sup> Eden,<sup>2</sup> Shorstein,<sup>3</sup> Cairns,<sup>4</sup> and others have shown close agreement in the methods they have adopted. The broad principles observed by them have been to clean up the surface wounds with the most rigorous aseptic methods available, to explore for fractures, to remove all dead tissue, foreign bodies, and loose bone down to the dura mater, but below that protective membrane to exercise a healthy regard for the reparative properties of brain tissue. Ascroft<sup>1</sup> urges that an apparently intact dura should be preserved, but that the best results are obtained in penetrating injuries by sucking out necrotic brain tissue, which comes away with ease, leaving *in situ* any foreign bodies the removal of which might cause unnecessary damage to the brain. He advises a light application of a sulphonamide powder, leaving the dura open to drain into the surface wound, which is in turn drained in the ordinary way.

During the last war Cushing<sup>5</sup> said that "every scalp wound, no matter how trifling, is a potential penetrating wound of the skull," and McKissock and Brownscombe<sup>6</sup> echoed this when they showed that an apparently trivial head injury may soon cease to be trivial if great surgical care is not taken from the beginning. When all the immediate steps have been taken there is a period of anxious watching, especially if the patient is in coma, and it is then that the medical aspect of the injury becomes as much a concern of the surgeon as of the neurologist. As most of the patients with closed head injuries have wounds of the scalp, or elsewhere, they tend to find themselves, when they recover consciousness, in a surgical ward, and a surgeon has to be responsible for their medical management. Jefferson<sup>7</sup> has shown that if a head injury is fatal death usually occurs in the first day or so, for it is most often the result of extensive laceration, involving the brain stem, the symptoms of which have been described by Denny-Brown.<sup>8</sup> There is unfortunately little that can be done for the patient dying from serious damage to basal structures, but there is certainly much that should not be done. The old idea that the effects of a head injury depended upon general oedema of the brain has not survived the experience of the past five years, but, on the contrary,

Denny-Brown and his colleagues<sup>9, 10</sup> have shown that the changes are instantaneous, and are a direct result of the mechanical commotion which the injury produced. The ancient title "*commotio cerebri*" is in fact an accurate description of the physical changes which take place, although the minute nature of these changes—whether in the neurone, blocking at the synapse, or interruption of fibre conduction—is not known. Holburn<sup>11</sup> has recently shown by physical models the nature of the stresses and shears which contribute to the total commotion. It seems that unconsciousness in the subject of a head injury is the result of *commotio cerebri*, or concussion, and that cerebral laceration, haemorrhage, or local oedema are epiphenomena. Concussion begins with a total reflex paralysis, as Denny-Brown has shown, and the severity of the laceration or haemorrhage is likely to be related to the severity of the concussion, but it is because the relation is not close that there is so much variability in the pattern of head injuries. The picture of concussion, with unconsciousness, flaccidity, and bradycardia, is complicated by signs of the local lesion, and it is the physician's main function at this stage to watch the patient for changes which indicate progression of the overlying complications of haemorrhage, whether intra- or extra-cerebral, and later of infection or oedema. It is now that watchful inactivity may be commendable and that active interference may relieve the doctor more than it does the patient.

Symonds and Russell<sup>12</sup> have shown that the results of conservative treatment of acute head injuries may be excellent, and that the kind of man who is injured is about as important as the kind of injury he has received. But this does not mean that the physician should remain idle. After attention to the immediate surgical condition his purpose should be to establish a base line from which he can measure any changes in the patient's condition. The depth of unconsciousness and the behaviour of the patient should be accurately assessed, and abnormal signs should be observed by routine examination. A lumbar puncture should usually be performed, not just because blood may be found, or because the pressure may be raised, but because an increase in the amount of blood or of pressure may indicate the progress of a complication such as an increasing intracerebral, subdural, or extradural haemorrhage. Patterson<sup>13</sup> has recently described in some detail the kind of changes which may be expected in the cerebrospinal fluid in the acute stages of head injury. X-ray examination of the skull may indicate a depressed fracture, or one involving sinuses or the middle meningeal region which may call for surgical intervention, or the electro-encephalogram may be used to follow the progress of the general cerebral condition.<sup>14</sup> The problem is primarily one of diagnosis rather than of treatment.

The actual differential diagnosis of complications when they arise may indeed be difficult, and most surgeons will have recourse to exploratory burr holes if there is any suspicion that a deterioration in the patient's condition is due to extracerebral bleeding, proceeding to exploratory

<sup>1</sup> *Lancet*, 1943, 2, 211.<sup>2</sup> *Ibid.*, p. 689.<sup>3</sup> *Ibid.*, 1944, 1, 44.<sup>4</sup> *British Medical Journal*, 1944, 1, 33.<sup>5</sup> *Brit. J. Surg.*, 1918, 5, 555.<sup>6</sup> *Lancet*, 1941, 1, 593.<sup>7</sup> *Glasgow med. J.*, 1942, 138, 77.<sup>8</sup> *Lancet*, 1941, 1, 371.<sup>9</sup> *Brain*, 1941, 64, 93.<sup>10</sup> *Ibid.*, p. 223.<sup>11</sup> *Lancet*, 1943, 2, 438.<sup>12</sup> *Ibid.*, 1943, 1, 7.<sup>13</sup> *J. Neurol. Psychiat.*, 1943, 6, 87.<sup>14</sup> *Ibid.*, 1941, 4, 107.

needling if intracerebral blood is suspected. Once the possibility of any of these complications has been raised, the investigations may well pass into the sphere of the experienced neurosurgeon, who will prepare for ventriculography and craniotomy if necessary. If the watchful clinician finds no sign of deterioration in the patient's condition he should treat him by giving him every chance to survive the period of maximal cerebral commotion. He should be kept quiet by such drugs as chloral or intramuscular paraldehyde, should receive nourishing fluids by mouth unless coma is so deep as to cause the risk of aspiration, and should get all the nursing that will conserve his powers of recovery. There is no warrant at all for dehydration. The patient should not be restrained, and the confused, mildly resistive patient is better sitting in an armchair than being unnecessarily restrained in bed. It may not seem satisfactory merely to remain watchful in the acute stages of head injury, but the results justify the self-discipline which such an attitude requires.

### TUBERCULOSIS IN WARTIME

One of the outstanding and now well-known features of vital statistics during the past 100 years has been the rapid rate of decline in mortality from tuberculosis. In 1851-5 the standardized death rate per million was 3,638 for all forms of tuberculosis, and 2,890 for respiratory tuberculosis. The corresponding rates for 1938 were 602 and 476, about one-sixth of their former level. Mortality from tuberculosis provides a sensitive index of prevailing economic and environmental conditions, and when war broke out thirty years ago the curve of mortality ceased to go down, and instead rose continuously from 1914 to 1918. The war over, down went tuberculosis mortality once more. A disquieting feature of the wartime rise was the increase in mortality among young adults, and the death rate among them remained above the pre-war level for some years after 1918, the rate of decline being more gradual for young women than for young men. In so far as one factor in tuberculosis mortality was concerned, it was thought that increased knowledge of nutrition and the better distribution of food would place this country in a better position in 1939 to stem a possible rising tide of mortality from tuberculosis. But the death rate from all forms went up. In 1939-42 the deaths from respiratory tuberculosis numbered 21,544, 23,660, 23,633, 20,983; and from other forms, 4,080, 4,484, 5,036, 4,560. Much of the higher mortality in 1940-1 could be attributed to the increased risk of dying to which tuberculous patients were exposed in the highly abnormal circumstances of these two years, and this probably explains the fall in mortality during 1942. A distinction must be made between increased mortality and increased incidence, but as there has been a rise in the incidence of tuberculosis during the war this will sooner or later be reflected in the mortality rate. No statistical data in age groups will be available for the whole country for some time. The effect of war on tuberculosis in London has been examined by Dr. W. Allen Daley and Mr. B. Benjamin, whose interesting analysis in these columns two years ago<sup>1</sup> was recently

followed up by a further communication.<sup>2</sup> In the latter article these authors state that the number of new pulmonary cases per thousand in 1942 was half the 1941 rate for the age groups 0-4 and 5-14, but was 174% and 226% of the 1938 rate. For ages 15 and over the incidence of pulmonary tuberculosis rose in 1942, and the infection rate was 130% of the 1938 rate. In each of the above groups the death rate from pulmonary tuberculosis declined in 1942: the tuberculosis death rate among London children was only slightly higher than the peace time level, but for adults it was 136% of the 1938 rate. The trend of tuberculosis in London has probably been affected by the movement of the population, especially by the return of evacuated children during the second half of the war; this increased the numbers at risk, but did not in proportion increase the incidence of the disease.

In our opening pages this week Dr. Percy Stocks and Dr. E. Lewis-Fanning examine the increase of respiratory tuberculosis in England and Wales during the present war by relating the notifications of tuberculosis to the death among notified cases. In the past notification of tuberculosis has not always been a trustworthy guide to the actual incidence, but Stocks and Lewis-Fanning are satisfied that in the recent pre-war years the trend of notification was consistent with that of mortality among notified cases. Each year of this war there has been an increase in the notification of respiratory tuberculosis: 42,500 new cases were reported in 1943, compared with 34,930 in 1939. The deaths of notified persons rose from 19,793 in 1939 to 21,480 in 1940, and then fell during the next three years to 18,150 in 1943. The introduction of mass radiography would tend temporarily to increase the notification rate but the inclusion of persons who would normally escape notification can form only a part of the increased incidence, since there has been no corresponding decline, but rather a rise, in the deaths from tuberculosis of unnotified persons. The deterioration of the standard of notification may have been due, in part, to the widespread movement of population. Stocks and Lewis-Fanning attribute a part of the rise in the deaths during 1940-1 to the effect of the severe conditions of that period on persons already notified: they estimate that 2,900 notified patients died during 1940-1 who would have normally survived until 1942. They also reckon that during 1940-1 respiratory tuberculosis killed off 1,500 notified and 1,000 unnotified persons who in normal times would not have died of the disease. Comparing the actual deaths among notified cases between 1940-3 with the deaths that would have been expected if these had been years of peace, the authors show that in these four years 6,000 deaths from respiratory tuberculosis may be directly attributed to war conditions, distributed thus: about 1,200 in 1940-1, about 1,900 in 1942, and about 3,000 in 1943.

### RESEARCH INTO HEARING AND DEAFNESS

By arrangement with the Medical Research Council a otological research unit has been established at the National Hospital for Nervous Diseases, Queen Square, London W.C.1. It is to be jointly maintained by the council and the hospital, as in the case of the existing neurologi-

<sup>1</sup> *British Medical Journal*, 1942, 2, 417.

<sup>2</sup> *British Medical Journal*, 1943, 2, 712.



research unit. The director is Dr. C. S. Hallpike, a whole-time member of the council's scientific staff, and aural physician to the hospital. The M.R.C. have also appointed three new committees to advise and assist them in promoting a general programme of research work into problems of deafness. These will deal with the following divisions of the subject: (a) medical and surgical problems of the causation, prevention, and treatment of deafness (chairman: Prof. H. Cohen, University of Liverpool); (b) electro-acoustical problems relating to the design and application of instruments used in the investigation and alleviation of deafness (chairman: Dr. W. G. Radley, Post Office Research Station); (c) problems relating to the educational treatment of deafness in children and adults (chairman: Prof. F. C. Bartlett, University of Cambridge).

### AETIOLOGY OF NEONATAL DIARRHOEA

Outbreaks of diarrhoea among infants in maternity units have lately been causing concern both here and in America. It is probable that the disease is not a new entity but rather that it has been brought into prominence by more careful recording and investigation in recent years. Craig,<sup>1</sup> in 1936, described the clinical and pathological features of the infection as seen during the previous three and a half years in a maternity department in Edinburgh: mild dyspepsia, usually after the introduction of cow's milk into the feeds; listlessness; loss of appetite; weight progress slight or nil; frequent, watery, foul-smelling stools; some fever; then progressive loss of weight, and vomiting, sometimes of blood-streaked mucus. Ulcerative stomatitis was a common complication. Dehydration and toxæmia, with the infant drifting into a semi-comatose state, completed the downward course to death in 7 to 14 days. At necropsy hyperaemia and swelling of the intestinal mucosa with enlarged Peyer's patches and mesenteric glands was a constant finding in 11 fatal cases. Other workers have remarked on the paucity of pathological changes post mortem.

The aetiology of the condition is obscure. In connexion with the outbreaks described by Ormiston,<sup>2</sup> bacteriologists<sup>3</sup> in the E.P.H.L. Service made an exhaustive examination of the intestinal flora of affected cases and, for comparison, of normal infants. No intestinal pathogens, bacterial or protozoal, were isolated, and no evidence was found of any bacterial toxin—e.g., of staphylococcus or the Welch bacillus—likely to cause the diarrhoea. A preformed toxin in the breast-milk of feeding mothers due to enterotoxigenic staphylococci was also considered, but the infection is comparatively rare and usually mild in breast-fed babies, and *Staph. aureus* is present in the breast-milk of more than half the healthy mothers with healthy babies. It was concluded that the two likeliest causes were either (1) a systemic infection or a general metabolic disturbance leading secondarily to diarrhoea and vomiting, or (2) a primary virus infection of the alimentary tract. Virus infections of the gut are rare, but support for a virus aetiology in neonatal diarrhoea comes from Baltimore in a report from Light and Hodes,<sup>4</sup> who were able to reproduce a clinically similar condition in young calves by the nasal instillation of Seitz-filtered stools from affected babies in four different outbreaks. At least 8 c.cm. of the filtrate was required to produce a dysenteric type of diarrhoea after an incubation period of 2 to 5 days, and, as some of the material was almost certainly swallowed, the infection may have been primarily intestinal. In one series of tests the causative agent was passed

through twenty-nine calves, ten times with filtered material; in others two, four, and eight passages were successfully effected. The diarrhoea in the calf tended to persist, with an average duration of three weeks and a case mortality of 13%. Post-mortem examination showed hyperaemia of the intestinal mucosa with enlargement of the lymphoid tissue and of mesenteric glands, a picture remarkably similar to that described in infants by Craig. Cross-infection by contact occurred, giving rise to a mild form of the disease. Stools from four healthy calves and eight healthy infants failed to evoke any diarrhoea in inoculated calves, while other tests suggested that the condition was not calf scours or the virus infection pneumo-enteritis. Infected calves were resistant to subsequent inoculation, and a few experiments indicated that a specific antibody had developed in the sera of some of the affected infants. One curious finding was that the active principle of this calf diarrhoea was not destroyed by five minutes' boiling, though inactivated after ten minutes' boiling; similarly, it resisted heating at 70° C. for 1 hour, but not at 80° C. for 1 hour. These experiments will evoke much interest, and if corroborated they may give a clue to the analogous gastro-enteritis of older infants. Meanwhile, it must not be forgotten that severe diarrhoea and vomiting is a rarity in breast-fed babies, and every encouragement must be given to the establishment of breast-feeding in the maternity department and afterwards during the first six months of life.

### POISONING THE ENDOCRINE GLANDS

Research in endocrinology has usually followed three lines: the observation of disordered states, the effects of extracts, and the effects of extirpation. Fruitful though these methods have been, they have brought us but a little way towards an understanding of this most complex branch of medicine, and any new approach is of great interest. In the last few months we have seen the first-fruits of a pharmacological attack. The fascinating history of the discovery of thiouracil, beginning with observations of the poisonous effects of cabbage on the thyroid glands of rabbits, was told recently in this *Journal*.<sup>1</sup> Another example of the new approach is given by recent reports on the action of alloxan on the islets of Langerhans. Jacobs<sup>2</sup> in 1937 reported hypoglycaemia after the injection of alloxan into rabbits, but the observation seems to have remained unexplained and forgotten until its accidental rediscovery by Shaw Dunn<sup>3</sup> and his colleagues in 1943. The injection of this derivative of uric acid into rats and rabbits produces a transient rise in blood sugar, then a phase of hypoglycaemia which is sometimes fatal, and finally, in those animals which survive, necrosis of the islets of Langerhans and a condition resembling diabetes in man not only in its clinical signs but in its susceptibility to treatment with insulin. Shaw Dunn suggested that the hypoglycaemic phase was due to overstimulation of the islets and the ultimate diabetes to their death through exhaustion, but this hypothesis did not explain the first hyperglycaemic phase. The work, which has been amply confirmed by many workers, has been continued by Hughes, Ware, and Young,<sup>4</sup> who have found that islet changes were present within five minutes of the injection of alloxan. They failed to discover any histological evidence of a phase of over-activity, and found, moreover, that in well-fed animals the hypoglycaemia was comparatively mild. They succeeded in reproducing

<sup>1</sup> *Lancet*, 1936, 2, 68.

<sup>2</sup> *Ibid.*, 1941, 2, 588.

<sup>3</sup> *Ibid.*, p. 590.

<sup>4</sup> *Amer. J. Publ. Hlth.*, 1943, 33, 1451.

<sup>1</sup> *British Medical Journal*, 1943, 2, 783.

<sup>2</sup> *Proc. Soc. exp. Biol.*, 1937, 37, 507.

<sup>3</sup> *Lancet*, 1943, 1, 482.

<sup>4</sup> *J. Path. Bact.*, 1943, 55, 245.

<sup>5</sup> *Lancet*, 1944, 1, 148.

tactly the blood sugar changes of their alloxan-poisoned rabbits by giving a dose of protamine-zinc-insulin equal to the insulin content of the rabbit's pancreas (10 units), and two doses of adrenalin, one with the insulin and one an hour later. This suggested a simpler explanation than Dunn's: that the first hyperglycaemia is due to the release of adrenaline, and the hypoglycaemia to the liberation from dying islets of their store of preformed insulin, in some such manner as the delay in the action of thiouracil may be due to the body's store of preformed thyroxine.

The importance of this work is threefold. In the first place we now have a simple method of inducing diabetes mellitus in experimental animals without recourse to surgery. In the second place the possibility has arisen that the cause of natural diabetes may be an error in metabolism resulting in the excessive production of alloxan. In the third place, once again within a few months, attention has been drawn to a substance which has a selectively poisonous action on an endocrine gland. A search for further endocrine poisons is due.

### LEPROSY IN CHILDREN

During the last quarter of a century of renewed interest in leprosy it has been recognized more and more that the key to the problem of lowering the incidence of the disease lies in the prevention of the frequent infections in childhood. During the last seven years this aspect of the question has been closely studied at the Silver Jubilee Clinic, Madras, by Dr. R. G. Cochrane, who has summarized his investigations in three Madras University lectures (published by the Government Press, Madras). The lecturer quotes with approval the evidence given in the work on leprosy of Rogers and Muir to show that a large proportion of leprosy infections take place before the age of 15 years among children living in the same house as in open case of leprosy—that is, one discharging lepra bacilli from lesions of the skin and nose. The Madras study of 551 children showed that over 70% of the serious epromatous cases, and of the incipient lesions of childhood of which Dr. Cochrane has called attention, were traced to contact with open cases of leprosy. In the mild resistant, and little-infective, neural type, including tuberculoid cases, such contact was traced in only 47%. Moreover, twice as many cases with multiple lesions were traced to house contact as those of milder infection with only one or two lesions. On classifying the cases of intrafamilial or house contacts, and extrafamilial or chance contacts, it was found that 90.4% of the incipient and 68% of the lepromatous cases were family house infections, against 55% of the mild neural cases. Dr. Cochrane therefore agrees with earlier writers in holding that the prevention of house contacts of healthy children with open infective types of leprosy will do more than any other single measure towards the control of leprosy. Family susceptibility is also discussed, and data are given to show that child infections were nearly as frequent (51.2%) among children living as co-tenants with non-relations as among those residing with blood relations (56%). Family susceptibility is thus regarded as of minor importance. In spite of recent improvements in the treatment of leprosy, prevention remains easier, as well as better, than cure. It is therefore of interest to recall that as early as 1897, on the advice of Ehlers of Copenhagen, Iceland prohibited children under 15 from living in any house containing an infective leper, with good results. The Madras work should hasten the time when this all-important preventive measure is far more generally adopted in leprosy-infected countries.

### DISINFECTANTS

An aspect of hygiene which does not always get the attention it deserves is the choice of a disinfectant and its correct use. When the purpose concerned is really deodorant effect, as in urinals and water-closets, or fly-repellant action, as in refuse heaps, other considerations apply, and a bad choice need bring no disaster; but where it is really necessary to disinfect with certainty an efficient agent must be used, and used rightly. Excreta, linen, and various utensils, baths, and sometimes beds and floors, may require chemical disinfection for definite reasons. This sort of task is made easier by freedom from one limiting consideration which enters into the application of disinfectants to the skin, since it does not matter much if the substance used is toxic or irritant. The main requirement is germicidal efficiency, and secondary though important ones are availability and cheapness. Efficiency for some of these purposes means capacity to disinfect despite the presence of organic matter, in the form of faeces, mucoid secretions or pus. Whole classes of disinfectant are excluded by their incapacity to act in such an environment, excellent as they may be under more favourable conditions: these include oxidizing agents such as potassium permanganate and anything acting by the liberation of chlorine, though calcium hypochlorite if used very liberally may serve for some purposes. The class of disinfectant best adapted to this type of use is that obtained from coal-tar distillates, and includes phenol, cresols, and the tar acids of higher boiling-point and lower solubility in water which are the active constituents of many white and black fluids forming emulsions on dilution. Phenol is thoroughly reliable if used in adequate strength—usually 5%—even in the presence of plentiful organic matter. Lysol, which is a soapy solution of cresols, acts similarly in 2% solution—that is, its germicidal activity is greater than that of phenol and not greatly impaired by organic matter. The choice between these two, unless the solvent and cleansing action exerted by the soap in lysol is required, as in the disinfection of baths, is largely a question of price. During the war another consideration has arisen: phenol and certain cresols are the raw material of important plastics, and economy in their medical use was called for in consequence. It is reassuring to hear, as announced in this *Journal* recently, that the phenol supply position has now improved. White and black fluids have some advantages over phenol and cresol, and some drawbacks. They are less poisonous but more messy, more efficient in favourable conditions but much more susceptible to the quenching effect of organic matter: a fluid having a Rideal-Walker coefficient of 20 may have a Chick-Martin coefficient of only 4, which fairly reflects the difference between action in pure water and action under moderately unfavourable natural conditions. A good fluid of this type, used according to the directions of a responsible manufacturer, is nevertheless a valuable and reliable agent for many purposes, and certainly the best choice if lysol or phenol are unobtainable. Some of these fluids, owing to their freedom from caustic effect, may also be used if necessary on the skin or even, as has recently been pointed out in our correspondence columns, for the first-aid treatment of wounds.

The London School of Hygiene and Tropical Medicine (Keppel Street, Gower Street, W.C.) announces an address "Teaching and Practice in Preventive Medicine" to be given on Friday, June 2, at 3.30 p.m., by Dr. J. M. Mackin, recently appointed Professor of Public Health in the University of London. Lord Woolton will take the chair.

## A NOTE ON THE VITAL STATISTICS OF ICELAND

BY

AGNES TELEKY, Dr. Rer. Pol.

For obvious reasons the vital statistics of Iceland have a more direct interest for English and American readers now than they would have had five years ago, and, on the suggestion of Prof. Greenwood, I have brought together some facts which are worthy of consideration.

Nearly 20 years ago Greenwood (*J. roy. stat. Soc.*, 1924, 87, 493) made a detailed comparison of the rates of mortality in England and Wales and Sweden for ages from 15 years upwards, supplementing this by a reference to earlier years of life. This is the story. A century ago males in Sweden died at lower rates than males in England at all ages under 35 and at higher rates at older ages. Females at all ages died at higher rates in England and Wales. This state of affairs gradually changed,

which 1911 and 1933 are the central years. The results are shown in Table I and, as percentages of the corresponding English rates, in Table II. In the last generation Iceland and Sweden had a similar relation to England and Wales: the unfavourable mortality in adolescence and young manhood is somewhat accentuated in Iceland, partly because of the greater chance of death from sea risks in a population so largely dependent on the sea for a livelihood, partly perhaps a mere chance fluctuation.

In 1933 Iceland had lost something of her advantage in early childhood, but in later ages was in much the same relative position as a generation earlier. Except in the first five years of life and at those later ages in which Sweden had, and retains, a considerable advantage over England and Wales, the change between 1911 and 1933 has been much in favour of Sweden. Only in the age group 20-25 is the mortality rate in Sweden appreciably higher than in England and Wales; in the age group 5-10 the Swedish rates are more than 30% better than those of England and Wales. As the industrialization of Sweden has presumably continued, the comparison is not

TABLE I.—Death Rates in 1911 and 1933

Ages	1911						1933					
	Males			Females			Males			Females		
	Engl. & W.	Sweden	Iceland	Engl. & W.	Sweden	Iceland	Engl. & W.	Sweden	Iceland	Engl. & W.	Sweden	Iceland
0-1 ..	1,612	843	885	1,309	668	721	735	588	533	559	435	413
0-5 ..	473	249	268	401	207	214	199	144	152	158	110	135
5-10 ..	35	34	34	34	34	40	22	15	24	21	13	18
10-15 ..	20	27	22	21	28	35	15	13	19	14	13	16
15-20 ..	30	45	62	27	43	51	26	24	36	23	24	32
20-25 ..	39	64	94	32	49	66	33	36	68	29	32	61
25-30 ..	50	59	100	41	56	63	35	35	66	32	33	55
30-35 ..	81	65	107	66	63	70	57	45	63	46	40	57
35-40 ..	147	86	114	114	96	206	93	79	110	83	72	73
40-45 ..	196	199	272	230	155	180	117	163	171	173	148	143
45-50 ..	634	440	546	509	371	405	567	433	435	440	380	317
50-55 ..	1,357	1,066	1,199	1,164	979	1,003	1,394	1,047	1,076	1,144	961	820
55-60 ..	2,707	2,412	2,844	2,327	2,301	2,558	2,865	2,558	1,913	2,594	2,356	1,978

TABLE II.—Death Rates of Sweden and Iceland expressed as Percentages of Those of England and Wales for 1911 and 1933

Ages	1911				1933			
	Males		Females		Males		Females	
	Sweden	Iceland	Sweden	Iceland	Sweden	Iceland	Sweden	Iceland
0-1 ..	52	55	51	55	80	73	78	74
0-5 ..	53	57	52	53	72	76	70	85
5-10 ..	97	97	100	118	65	104	62	76
10-15 ..	135	110	133	167	87	127	93	129
15-20 ..	150	207	159	189	92	138	104	139
20-25 ..	164	241	137	206	109	206	110	210
25-30 ..	118	200	137	154	100	189	103	172
30-35 ..	84	132	103	106	79	170	87	124
35-40 ..	74	103	75	82	68	94	87	88
40-45 ..	67	92	67	78	69	72	86	81
45-50 ..	69	86	73	80	76	77	86	72
50-55 ..	79	88	84	86	75	77	84	72
55-60 ..	89	105	99	110	89	67	91	76

By the beginning of the twentieth century the inhabitants of England and Wales had, after infancy and down to early adult life (about age 30 in males and 35 in females), much lower rates of mortality than Sweden, and at later adult ages much higher rates of mortality. This contrast of advantage in later childhood and earlier adult life with disadvantage in later adult life has been thought to characterize industrialized States as compared with agricultural States at the same level of civilization, because a roughly similar contrast emerges as between urban and rural districts of England and Wales.

Greenwood's paper brought the story down to the last generation. The other Scandinavian countries showed a roughly similar state of affairs. Although, of course, these countries have developed some industries, they may still be considered "agricultural"—if we extend the term agricultural to cover sea-faring occupations—and Iceland belongs to the same group both racially and industrially. In the last generation there has been a change. To bring this out I have compared the rates of mortality of England and Wales, Sweden, and Iceland for the years 1911 and 1933. As the population of Iceland is very small the rates here are based upon the quinquennia of

flattering to English rates, and may suggest subjects for inquiry. Iceland, we have seen, can be regarded as bearing the same relation to England and Wales now as Sweden had a generation ago.

The effect of the war on the distribution of doctors in the United States has been the subject of a report by Drs. Perrott and Davis, and this was discussed in the *Journal of the American Medical Association* of Jan. 15. The survey reveals that the war has already withdrawn something like one-third of the active practitioners, the number of civilian doctors having fallen precipitously—from more than 120,000 on Jan. 1, 1942, to about 85,000 at the end of 1943. Concurrently the recruitment of civilian doctors has diminished greatly and the armed Services expect to take 80% of all new medical graduates. During the past twenty years there has been a trend for the States rich in medical man-power to become richer and for the States poor in medical man-power to become poorer. The analysis made by these officers of the U.S. Public Health Service, says the *J.A.M.A.*, serves to indicate certain aspects of the distribution of physicians to which attention may well be directed in post-war planning for medical services.

## A NATIONAL WATER POLICY

Proposals for ensuring that all reasonable needs for water by householders, industry, and agriculture can in future be met, and met speedily and without avoidable waste, are made in a White Paper\* presented to Parliament on April 18 by the Minister of Health, the Minister of Agriculture and Fisheries, and the Secretary of State for Scotland. "There is in this country ample water for all needs. The problem is not one of total resources but of organization and distribution." The object of the Government's proposals is therefore the shaping of a national water policy which will ensure a planned and economical use of the resources of the country and efficient administration of supply services. Some of the main proposals are outlined below:

The Health Ministers, whose powers are at present vague and ill defined, to be given the express statutory duty of promoting the provision of adequate water supplies and the conservation of water resources.

Central planning of water policy to be the function of the Health Ministers; to be based on comprehensive information, systematically collected and assessed, regarding water resources and needs; and to be applied by a simplified system of Ministerial orders. Interested parties to have full opportunity to put their views before the Minister; Orders on certain matters to be subject to review by Parliament by reason of their intrinsic importance or because of their effect on the interests of the general public or of individuals.

The Government's Central Advisory Water Committee to be reconstituted as a statutory body. It will advise not only on matters referred to it by any Government Department but also on its own initiative on any question within its ambit. A somewhat similar body to be set up for Scotland.

Surveys of the efficiency of water supply services to be carried out regularly by expert central staffs. The general framework of existing local organization to be retained, but powers of the Minister of Health to be strengthened, and amalgamation of undertakings to be encouraged and, if necessary, enforced to secure efficiency and economy. Special steps to be taken to protect water resources, especially underground water, against misuse, waste, and pollution.

Provision of Exchequer grants totalling £15,000,000 for England and Wales, and £6,375,000 for Scotland, for extension of piped water supplies and sewerage in rural areas.

This programme means new legislation. In advance of general legislation, a Bill is to be presented to Parliament this session authorizing the grants for water supply and sewerage in rural areas as part of the general reconstruction programme. While the problem in Scotland is broadly similar to that in England and Wales, account must be taken of differences in geography, local government structure, law, and water supply organization in the two countries. The Government's proposals, as affecting the Scottish service, are described in a separate section of the White Paper.

## SPECIAL RATIONS FOR INVALIDS

The Ministry of Food announces that, in accordance with the recommendations of the Food Rationing (Special Diets) Advisory Committee, the following special food allowances have been made for invalids and sick persons.

**Priority Liquid Milk in Actinomycosis.**—Patients suffering from actinomycosis may have two pints of priority liquid milk a day. This condition will fall in Class 1 (a) of the schedule of diseases. Medical certificates will be valid for a period of three months, and renewable for further three-monthly periods as in cases of tuberculosis.

**Extra Meat in Hypoproteinaemia.**—Three extra meat rations a week are now available in proven cases of hypoproteinaemia from any cause. Applications, supported by a detailed medical certificate, must be made to the local food office. The extra rations will be for an initial period of six months, renewable on production of a fresh medical certificate stating that the patient is still suffering from this condition.

**Dried Bananas in Coeliac Disease.**—The Red Cross and St. John War Organization is providing dried bananas, at the rate of three and a half pounds a week, free to patients suffering from coeliac disease. This is in addition to the extra meat already provided by the Ministry. Applications must be made to the local Food Office supported by detailed medical evidence, including the clinical data on which the

diagnosis is based, unless such evidence has already been given with an application for extra meat. Supplies will be provided for three months, at the end of which time a fresh medical certificate will be required.

**Household Milk Powder.**—Two tins a week of household milk powder (dried skimmed milk powder) are now available against a medical certificate for persons suffering from steatorrhoea, gout, or infective hepatitis (catarrhal jaundice), toxic jaundice, and cirrhosis of the liver (but not obstructive jaundice). The certificate must give the clinical and biochemical data on which the diagnosis of steatorrhoea or gout is based. Applications should be made to the local Food Office. Supplies will be arranged for an initial period of three months, when a fresh certificate will be required.

## APPROVED NAMES OF DRUGS

The General Medical Council has approved the following names for substances produced by British manufacturers, in some instances under licence granted by the Comptroller-General of Patents, Designs and Trade Marks. The question of including these in the *British Pharmacopoeia* is under consideration, and if that is done the intention is that the approved name shall become the official title. Recognition of an approved name does not imply that the name will necessarily be admitted to the *Pharmacopoeia*.

Approved Names	Other Names
Desoxycortone acetate .. ..	Δ-4-pregnen-21-ol-3 : 20-dione acetate
	Desoxycorticosterone acetate.
Dicoumarol .. ..	3 : 3'-methylene-bis-(4-hydroxycoumarin).
Dimethylstilbamidine .. ..	4 : 4'-diamidino-α : β-dimethylstilbene.
Pentamidine .. ..	Diamidino-diphenoxypentane.
Propamidine .. ..	Diamidino-phenoxypropant.
Stilbamidine .. ..	Diaminosilbene.
Sulphadimethylpyrimidine .. ..	2-(4-aminobenzene)sulphonylamino-4 : 6-dimethylpyrimidine.
	Sulphamezathine.
Thiomersalate .. ..	Sodium ethylmercurithiosalicylate.
	Merthiolate.

## Medico-Legal

### A "CURE" FOR THE DRINK HABIT

On March 2 at Bow Street Police Court, before Mr. McKenna, the Pharmaceutical Society of Great Britain prosecuted F. Cavendish-Longman, Ltd., publishers, trading as L. E. Venn, under the Pharmacy and Medicines Act, 1941, for selling an article recommended as a medicine without disclosing on the label the composition of the substance. Mr. R. A. Robinson was counsel for the prosecution and Mr. Du Cann was counsel for the defence. The plea was not guilty.

Mr. Robinson stated that the defendants advertised and sold a substance in powder form recommended as a cure for the drink habit. The public were invited by advertisement to apply for particulars and a free sample. An inspector employed by the Pharmaceutical Society replied to the advertisement and received a circular letter, booklet, and other advertising matter. In the booklet and other publications the dangers of alcoholism were stressed, and medical authorities were quoted for the statement that the drink habit led to serious diseases of the liver, kidneys, heart, and other organs. Later, further circulars were received by the inspector, who then sent 30s. to the defendants, from whom he received fifty powders, unlabelled. The directions were to take a powder with meals three times daily. The powders had been analysed and found to contain in each powder about 2 gr. of potassium bromid and about 5 gr. of lactose. Counsel contended that alcoholism was an infirmity within the meaning of the Act and that the drink cure was also recommended as a preventive of the various diseases to which excessive drinking was said to lead. The advertising matter included statements that the powders could be administered to the drink addict, without his knowledge, in beer, spirits, or tea, and that a distaste for alcoholic drinks would result. The inspector has not given defendants any particulars beyond his name and address so it could not be argued that the case came within the exemption allowed by the Act in favour of treatments prescribed by reference to the needs of a particular person.

Mr. Du Cann claimed that the advertisements did not recommend the substance as a medicine within the meaning of the Act, and that alcoholism was not an infirmity or ailment. Further, that the treatment was designed to meet the needs of particular persons. The company had now altered the labels and was now declaring the composition of the powders on the label.

The magistrate ruled against Mr. Du Cann, and found as a fact that alcoholism was an infirmity for the treatment of which the cure was recommended. He imposed a fine of £2 with £5 costs for the prosecution.

\* A National Water Policy, Cmd. 6515, H.M. Stationery Office, York House, Kingsway, W.C.2. (6d.; post free 7d.)

# An EXPLANATION

on

The present delays in the deliveries to patients  
of Anatomical, Surgical and Orthopaedic Belts,  
Spinal Supports, Braces and similar Appliances.

The undermentioned makers respectfully desire to make the following observations on the causes which affect deliveries of prescription orders to patients.

- (1) The present limitation of labour and in particular of trained labour engaged upon the making of these appliances.
- (2) An increase in the number of prescription orders now being received primarily to meet the needs of persons—particularly of women—engaged in the Services or on work of National importance.

Our labour problem is receiving the consideration of the appropriate Government Departments, and every effort is being made to restore, as far as possible, the prompt deliveries which have characterised our pre-war services to the medical profession and to their patients.

We trust the foregoing explanation will be received at a bona fide of our efforts to render the best possible service under difficult conditions.

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Pads of instruction cards for patients and a pamphlet are available. Pediculosis Capitis—

Benzyl benzoate destroys lice and, as prescribed in 'Ascabiol' emulsion, also dissolves the cement by which the nits adhere to the hairs. Instead of by the painstaking use of the small-tooth-comb, the nits are removed simply by washing the hair.

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the most effective local hæmostatic yet discovered

A dilute solution of Russell Viper Venom is the most effective local hæmostatic which has so far been discovered. It may be used in all types of hæmorrhage where the solution can be applied directly to the bleeding

point. 'Stypven' is invaluable in emergency when hæmorrhage cannot be controlled by every-day methods. It is also being increasingly used in place of brain extract for the measurement of prothrombin time.

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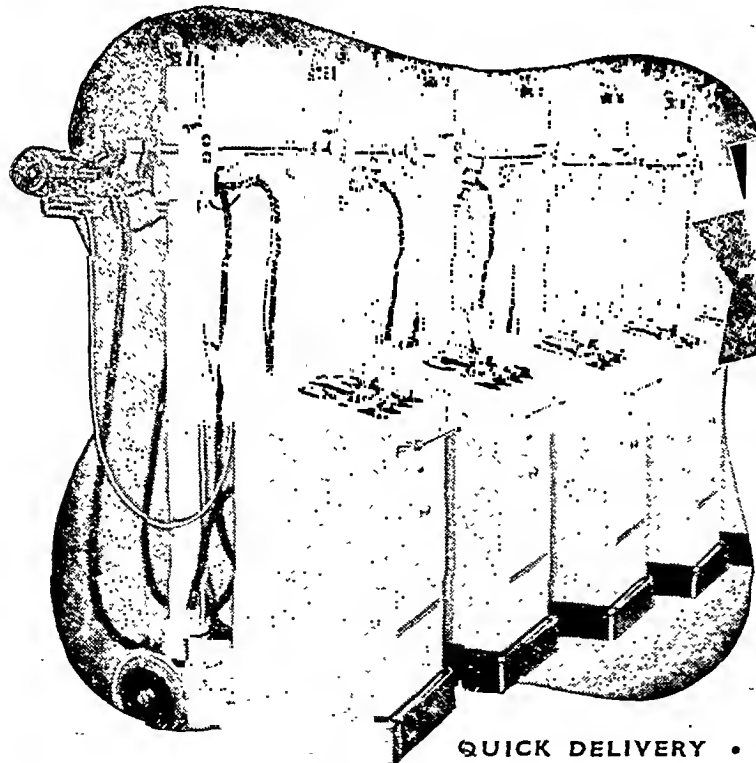
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## Nova et Vetera

## Correspondence

## FOREIGN BROTHERS OF THE BARBER-SURGEONS

Sydney Young, in the *Annals of the Barber-Surgeons' Company*, says of the foreign brothers that, with very few exceptions, they were all of them practising surgeons who had not been apprenticed to freemen of the Company. He also states that a very small number of pure barbers are entered on the records as foreign brothers, and hints that this may be due to errors of description on the part of the clerk who kept the books. Perhaps this is not true of every case, for on "April 17, 1599, Michael Bullocke complaineth of William Webbe forren brother for working with Henry Needham being not ceased with him and for grindeinge of rasres." A surgical foreign brother would hardly have submitted to grinding razors even at so early a date as this. And in the articles of 1555 it is ordained that "no floryner being no freeman shall . . . to make cleane teethe, to shave poll or washe a bearde or to tryme any man but within the Liberty where he dwelleth." This last note confirms Young's conclusions that nearly all foreign brothers had not been apprenticed to freemen of the Company. Two other references to foreign barbers occur in 1606 and 1635. In the early years of the Company's history the numbers of foreign brothers seem to have been small. Thus, in 1578 a levy, in answer to a precept by the Lord Mayor, was made by the Company on 90 freemen and upon 10 "foreins." But by the opening years of the eighteenth century there was a large increase in the numbers. This was probably due in part to the influx of foreign surgeons which occurred with the revocation of the Edict of Nantes in 1685 and with the Declaration of Indulgence in 1687.

The By-laws of 1606 contain among other details the oath of a foreign surgeon. In 1610 James Blackburne was examined and found "fit and allowed to practize (in that chirurgicall parte of surgerye touching the generative partes of women and bringing them to bedd in their dangerous and difficult labours)." He was therefore "sworne and admitted a floryner brother." The apprentice books of the Company at Barbers' Hall date from 1658. The earlier volumes contain practically no reference to foreign brothers; but as said earlier there are numerous mentions of this class of practitioner from 1700 to 1745. If a surgeon who had not served his apprenticeship to a freeman of the Company wished to practise within the Company's jurisdiction (City of London and circuit of seven miles round) he had either to join the Company as a foreign brother or, in theory at least, start again from the beginning by being bound apprentice to a freeman. This would have involved a delay of at least seven years. On admission as foreign brothers these men paid a fine, seven guineas was the usual amount, and had to satisfy the court, by the production of their indentures to country surgeons, that they had duly served an apprenticeship of seven years; they had also to undergo an examination by the Company's examiners.

Very occasionally a man was recommended by some person of quality and then the court dispensed with the production of indentures. All sea surgeons were foreign brothers; and Young says that some country surgeons became foreign brothers for the sake of the extra status conferred by possession of a diploma from Barber-Surgeons' Hall. The first really well known surgeon to become a foreign brother of whom I have knowledge is Paul Buissière, elected Aug. 20, 1691. All that is known of him is recorded by the late George Peachey in his excellent *Memoir of William and John Hunter*. From now on we find that some of these foreign brothers purchased their freedom, and so we often meet with cases on the books where an apprentice was bound to So-and-so, surgeon and foreign brother. (But in this connexion it is to be noted that Young states that in 1614, when a "foreigner" was admitted to the livery he paid £5 for yeomanry and £5 for livery fines in one payment. Young had found it difficult to determine what the exact status of the foreign brother really was. I am inclined to believe that it varied with the times.)

I suppose that the best-known foreign brother is John Ranby, surgeon to St. Thomas's Hospital and surgeon-general to George II. He was present at Dettingen and is generally supposed to be the surgeon mentioned by Fielding in *Tom Jones*. Ranby was the first master of the Company of Surgeons after the dissolution in 1745. Among his pupils was Sir Caesar Hawkins, but Hawkins was not bound apprentice at the Hall as he had already served his time with his father, Mr. Caesar Hawkins, of Ludlow, Salop. He obtained the freedom by purchase and was not a foreign brother. Another well-known foreign brother was David Middleton of St. George's and Surgeon-General to the Army. Of foreigners I may record the names of Figeul, Chovel, and Lamarque, all of whom were engaged in the teaching of anatomy in London in the early years of the eighteenth century.

R. R. J.

## Blood Cultures in Staphylococcal Septicaemia

SIR.—With the advent of penicillin there has come an increased interest in the treatment of staphylococcal septicaemia. In the *Journal* of April 15 four cases were reported with two deaths; in the same symposium were three cases of acute osteomyelitis with positive blood cultures—all recovered. In none of these cases, apparently, had repeated quantitative blood cultures been done, so that there is no record available of the severity of the blood-stream infection.

At a recent meeting of the Clinical Section of the R.S.M. similar cases were reported from St. Mary's Hospital without any quantitative blood-culture estimations. All these cases had been treated with penicillin. Valentine and Butler (*Lancet*, 1943, I, 194), in reporting 29 consecutive cases of staphylococcal septicaemia, showed that in 9 fulminating cases the colony counts rose to 500-1,000 per c.c.m. of blood. All died. In the next less severe group the counts were above 30 and rose to over 100 in the fatal cases; 3 patients survived out of 8. In the last group (12 cases) the colony counts never rose above 20; all lived except one patient. Similar figures have been reported by McClellan and Goldbloom from Canada (*Canad. med. Ass. J.*, 1942, 146, 136). A good many of the cases in the former paper were treated before the introduction of sulphathiazole. Since that paper was written I have had three patients who recovered whose colony counts rose to 95, 45, and 37 per c.c.m. respectively; they all had intensive treatment with sulphathiazole.

It is apparent from these figures that staphylococcal blood-stream infection is not always a fatal condition, but that it rapidly becomes so if the blood culture rises to 100 or more colonies per c.c.m. of blood. In order to show that penicillin cures cases of staphylococcal septicaemia it is not enough to state that the blood culture was positive and then became negative. It must be shown that patients recover whose blood cultures have reached the high figures already quoted above. This has been done in a few cases, but I should urge those who now have the opportunity to use penicillin for staphylococcal septicaemia to prove or disprove this important fact. In my opinion no case of staphylococcal septicaemia is accurately recorded unless the results of repeated quantitative blood cultures are also given.—I am, etc.,

The London Hospital, E

E. C. B. BUTLER.

## Tuberculin Jelly in Patch Testing

SIR.—Referring to the memorandum by Dr. Donald Paterson in your issue of April 15 on the use of tuberculin jelly in patch testing, this method as introduced and applied extensively by Prof. S. Monrad of Copenhagen (1936), and his jelly and its use were described by K. A. Jensen in *Tubercle* (1937).

As a direct result of Monrad's work, I have during the past two years been preparing a similar jelly for use in the Welsh National Memorial Association, and have also supplied it for tests in the military Forces and for a complete survey of the school-children of Radnorshire by Dr. T. E. Jones Davies, M.O.H. At present it is being used in still more extensive school surveys in Wales.

My original formula followed that of Monrad, but has since been substantially altered, and is still under minor alteration. It is prepared from purified tuberculin, at a final strength from two or three times that of standard old tuberculin, and has given results slightly higher than those of Mantoux tests, 1:1,000, in the same subjects. Our medical officers report the positive reactions as being stronger and more easily read than those produced by any of the commercial patch-test materials.—I am, etc.,

Department of Tuberculosis,  
Welsh National School of Medicine, Cardiff.

W. H. TYTLER.

## REFERENCES

- Editorial (1937). *Tubercle*, 18, 172.  
Jensen, K. A. (1936). *Ibid.*, 19, 467.  
Jones-Davies, T. E. (1943). *A Study of the Incidence and Epidemiology of Tuberculous Infection in the Elementary School Population of the County of Radnorshire*. Radnorshire County Council.  
Monrad, S. (1936). *Ugeskr. Læge.*, No. 41.

### Status Lymphaticus

SIR,—I write in hope of enlightenment from pathologists. Is not Dr. R. G. Cooke perpetuating a medical myth when he ascribes sudden death to status lymphaticus? (April 1, p. 457). Even if the condition does in fact exist and could be recognized by the criteria he mentions, are these criteria satisfied by the post-mortem results given? It seems that in the case he describes there were abnormalities which might provide bases for more probable explanations of the fatality.

The highly accurate work of Hammar and Boyd (confirmed by others) appears to dispose of the belief that the "persistent thymus" is an abnormality. These investigators have stated that there are no significant gross anatomical differences between the thymic and lymphatic tissues of persons who died suddenly from unknown causes and those of people said to have status lymphaticus.

My special interest lies in the fact that the lymphatic state has been held to be associated with emotional instability. In the past assertions little short of ridiculous have been made in this connexion because the studies have neglected the precaution of investigation of control material.—I am, etc.,

G. R. PEBERDY.

Major, R.A.M.C.

### BIBLIOGRAPHY

- Hammar, J. A. (1930). "Significance of Thyricolymphatic System," *Acta Paediat. Stockh.*, 11, 241.  
Boyd, E. (1927). "Growth of Thymus," *Amer. J. Dis. Child.*, 33, 867.  
Symmers, D. (1918). "Status Lymphaticus," *Amer. J. med. Sci.*, 156, 40.

### Tonsillectomy in Children

SIR,—I feel that I must contradict a remark at the end of Mr. T. B. Layton's letter (March 11, p. 372). He says: "... no such administration has as yet been set up which will give that minimum of a quarter of an hour between the parent upon whom the responsibility for decision rests and the surgeon in whose hands the responsibility for advising the operation is finally put." He is writing about tonsillectomy in children. I should like to describe a system at present working, and which, I may add, appears to provide more than "that minimum" required by Mr. Layton.

All cases reported to the school medical department, whether by school medical officers, private doctors, or parents, as possibly requiring an operation have their names and addresses, together with the doctor's letter, forwarded to the hospital where the ear, nose, and throat work is carried out. These names are forwarded to the department concerned and the surgeon sends for a group of such a size that he can give personal attention to each one. The children are sent for, it being a rule that they bring parent or guardian with them. Sessions last from 2 to 2½ hours, and the number of new cases sent for is usually eight or ten. What the mother complains of, the child's history, and results of examination are noted, and it is decided whether tonsils and adenoids should be removed, or adenoids only, or whether the case should be kept under observation, or requires other treatment. In a large number of catarrhal children advice is given on general health, diet, and hygiene. If the surgeon wishes to see the children again before or after operation, as is often the case, their names are put down for a definite date any time within six months ahead, and when the time comes they are sent for, as before, with parent. In a small percentage of cases the surgeon has before him the notes of children whom he has already been treating from infancy at a welfare centre, whence these notes follow them to the school clinic at the age of 5. I cannot describe the actual work better than by quoting from the annual report I had from the surgeon for 1943:

"Of 188 cases sent up as new cases, 113 have had operations for tonsils and/or adenoids, in a good many cases only for the latter. This means that in 75 cases operation has been avoided or, for good reason, postponed. The object has been to keep in touch with the patients by consultations with their parents and doctors. The number of visits has been 231 for the 188 patients; the difference is accounted for by keeping in touch with those in whom advice has been really needed rather than active treatment, and the number is considerable.

"... At the voluntary welfare clinic is held an ear, nose, and throat session, at which children from birth to school age are seen. Notes on health, diet, and treatment are kept, and, most important

of all, on advice given. These notes follow these particular children to the school clinic; the personal element is increased by the parent knowing the doctor and what he is aiming at. In the case of these slightly subnormal children the personal effort made over long period by parent and doctor, helped by a child who likes the doctor and likes the clinic, is of far more importance than isolated visits and operations."

The actual working of the system has been by weekly sessions, and it has been found in practice that approximately three clinical sessions to one operative session is satisfactory. I feel that this compares very favourably with the consideration that these children would have had in private practice.—I am, etc.,

IAN MACKAY,  
County Medical Officer of Health, Cheshire.

### Chewing-gum or Polypus?

SIR,—About a year ago a male patient, just before reporting to a medical board for National Service, was referred to me as a probable gastric ulcer. His symptoms were vague and physical examination revealed nothing abnormal. The x-ray report stated that there was a persistent filling defect in the pre-pyloric region, the diagnosis being a pre-pyloric polypus. I was about to write a medical report to the board to this effect when a "friend" of the patient, by an indirect route, gave me the "low-down" on the case. I received information that the patient had secreted chewing gum in his teeth, which was dislodged by the tongue as he swallowed the bismuth meal. This seemed to be a possible explanation of the filling defect, and a control x-ray a few days later was quite normal. Either the patient had failed to replenish his supply of gum or, if a pledget had been swallowed, it had successfully negotiated the pylorus. Anyway, I was then able to give a report—to the disappointment of the patient—that no gastric abnormality was evident.

Having recently encountered a similar case, it seems that this method of confusing the radiologist, and thereby the surgeon, may be more familiar to certain sections of the public than to the medical profession.—I am, etc.

London, W.1.

MCNEILL LOVE.

### Teaching of Anaesthetics

SIR,—I venture to suggest that much of the difficulty of teaching anaesthetics to-day would be largely eliminated if only more consideration could be given to the following:

Modern methods, rightly demanded by patient and surgeon, do tend to give undue prominence to the employment of elaborate apparatus. We all know the advantages and disadvantages of the gases and methods that require apparatus. The fact remains, however, that a large number of anaesthetics are, and probably always will be, given by medical men who, administering only occasionally, do not wish to buy expensive machines. Again, under war conditions, machines may be unobtainable or out of repair or, again, may be of a type with which they are unfamiliar. What does so often appear to be relegated to the background is the equally, and in many cases more, important aspect of modern anaesthesia—i.e., the psychological approach of the anaesthetist to his patient—in other words, the art and practice of suitable premedication. How to employ this in its widest aspect should surely be instilled into every student, undergraduate, or postgraduate before any type of anaesthetic mask is ever placed in his hands. The drugs, syringes, etc., necessary for premedication can be easily obtained and kept in the house of every medical man without the worry entailed over maintenance and condition of only occasionally used apparatus.

It is generally agreed that a smooth induction of anaesthesia in a patient from whom all apprehension has been removed makes for smooth maintenance and smooth recovery, and if we could secure this one feature of modern anaesthesia for every patient who has to submit to an operation we should have achieved something more than worth while. These benefits can be obtained, at least to a great extent, irrespective of what type of anaesthesia is going to be employed. Even if intravenous technique be ruled out, a well-medicated patient need not, and should not, suffer any greater discomfort during a correct induction of ethyl-chloride-ether sequence, etc.

CE-ether sequence, than he would if induced, for example, by  $N_2O$ -oxygen or cyclopropane.

It has been suggested that the surgeon might object to the employment of such "antiquated" methods; the patient's recovery might be delayed, and all the other usual condemnations. Now, Sir, on any large hospital operating list there are almost always some patients who could not honestly be said to be harmed by the correct administration of ether or CE mixture for 5 to 10 minutes. It is the induction period which gives the greatest difficulty to students. Once they have mastered the art of induction the principles of maintenance by the use of ether or CE mixture can be rapidly explained, and then, if the welfare of the patient demands it, a change-over to other methods of maintenance can be effected without difficulty by the instructing anaesthetist. For the pupil: "first things first."

I suggest that until, if ever, all anaesthetics are administered by the whole-time specialist action on these lines would grant the benefits of modern methods to every patient, and would enable every medical man to give an anaesthetic when suddenly called upon to do so under conditions where the employment of mechanical methods is impossible.

With regard to the attendance of students of anaesthetics at so-called minor operations in dental and out-patient departments, I think the importance of their so doing cannot be too greatly stressed, provided there is an experienced anaesthetist in attendance who is genuinely interested in securing their proficiency. It has been said that once proficiency in anaesthetizing at so-called minor operations has been achieved, the "majors" will look after themselves. It is the so-called minor cases that so often give difficulties. True judgment, that can only come from experience, is undoubtedly essential; for example, when the surgeon, during a big abdominal case, turns to his anaesthetist and says: "I have done the essential, will the patient stand another 10 minutes or so to make the ultimate condition even more hopeful?" With this last proviso in mind it might almost be said that anyone can give an anaesthetic for a gastrectomy: it frequently needs the master for dental or throat or other cases that so often come under that surely-to-be-condemned term "minor operation."—I am, etc.,

London, W.1.

T. DE LACY WALKER.

### The Oxford Vaporizer in India

SIR.—Much has been written about the Oxford vaporizer already, but when the apparatus was sent to the tropical climate of India there was some doubt whether it would be satisfactory. Therefore, the apparatus was tested, to see if it would give satisfactory results in the extreme climate of a plains station. During the summer the maximum temperatures recorded last year were almost  $130^{\circ} F.$ , many Europeans dying of heat stroke, whereas in the winter the minimum temperatures are often between  $40^{\circ}$  and  $50^{\circ} F.$ , blankets and eiderdowns being needed at night. It has proved to work perfectly, and have the same advantages as in an English climate. This is after several trials with many methods (see notes and observations below).

There is one point on which to dwell, and that is the "premedication" of the apparatus itself, which cannot be satisfactory unless the climate is considered. If the apparatus is to be used as it was intended—i.e., an Oxford vaporizer No. 1 giving out definite percentages of ether vapour—then the mercury of the thermometer on the machine has to be within the maximum and minimum limits (t2 and t1).

In cold weather hot water is poured into the water chamber about 20 minutes before the operation list begins, by which time the mercury of the thermometer will be within the required limits. If the apparatus is allowed to cool—i.e., the mercury being below the t1 limit—then the percentage of ether delivered to the patient will be about two-thirds of the percentage registered by the machine (confirmed by private correspondence with Prof. R. R. Macintosh). During the hot weather cold water is poured into the water chamber about 20 minutes before the operations begin. The cold water must be really cold. If the water is tepid then the mercury of the thermometer will remain above the maximum limit—namely, the t2 mark: in these circumstances the machine will act as

an Oxford vaporizer No. 2 by delivering a 100% ether vapour. However, the patient's respirations drawing air through the ether chamber cause some heat loss and eventually the mercury will come down to the required limits necessary for the machine to act once again as an Oxford vaporizer No. 1.

### Observations

- (1) The machine functions satisfactorily in those parts of India in which cold water is available during the hot weather.
- (2) Its own advantages are still present in the Indian climate:
  - (a) By giving out a constant concentration of ether owing to the constant temperature, the depth of anaesthesia tends to be more constant, the ether concentration being adjusted according to the depth of anaesthesia of the patient.
  - (b) By delivering heated ether the heat loss by the patient is less.
  - (c) The machine is a very mobile compact unit.
  - (d) Oxygen and/or carbon dioxide can be administered also through the apparatus.
  - (e) Nitrous oxide may be given with the machine, either solely for anaesthesia or for induction before ether anaesthesia.
  - (f) The patient is not likely to become cyanosed because there is always a constant supply of air in each inhalation.
  - (g) Endotracheal anaesthesia may be performed very satisfactorily either for E.N.T. or general operations.
  - (h) Post-operative pulmonary complications, especially in "bad operation risks," tend not to occur. Warmed ether helps to avoid such complications.
  - (i) The vaporizer is a simple apparatus, and a relatively inexperienced anaesthetist, with a little tuition, soon administers a satisfactory anaesthesia.
  - (j) The vaporizer gives excellent results during and after operations of long duration—e.g., 4 hours.
  - (k) There is no difficulty in obtaining a deep ether anaesthesia with perfect relaxation. Very small quantities of ether are used, and there is little ether in the atmosphere of the operating theatre.
- (3) The Oxford vaporizer was used 245 times.
- (4) Highest official temperature recorded in the newspapers was  $117^{\circ} F.$
- (5) Highest temperature in the operating theatre was  $102^{\circ} F.$
- (6) Longest time vaporizer was used for one operation—4 hours.

I have to thank Col. A. Moffat, I.A.M.C., and Lieut.-Col. A. K. Ashworth, R.A.M.C., for permission to publish this note.—I am, etc.,

P. H. BLACKISTON,  
Captain, Indian Army Medical Corps.

### Cerebral Malaria

SIR.—In your issue for Dec. 25, 1943, which I have recently received, I note with interest Surg. Lieut. Sneddon's description of a fatal case of cerebral malaria (p. 814). That the staff of the hospital were ignorant of this disease seems fairly obvious, but as cases of this nature are becoming increasingly more common away from tropical areas I think that some criticism of the treatment received by the patient is indicated. To a number of us in Australia who have served with the armed Forces in New Guinea the inadequate treatment given to severe cases of malaria by practitioners on the mainland ignorant of this disease has always been a great worry.

The pathology of cerebral malaria is known to most, and it is quite obvious, as Surg. Lieut. Sneddon points out, that the aggregate of infected red cells in the cerebral capillaries must be removed as soon as possible. The case described is classical enough, but in the case of a man who had been at sea and whose movements had to be cancelled, cerebral malaria should surely have headed the list of possibilities, and a blood film should be placed on the same priority as lumbar puncture. If Field's stain is employed this only takes a few minutes.

The initial treatment is correct enough, but quinine dihydrochloride can be administered without the medium of an intravenous saline infusion. It is preferable to give not more than  $7\frac{1}{2}$  gr. at a time in 10 c.cm. distilled water. The injection is given slowly (taking, say, 15 minutes) through a small needle. This must be repeated in 6 hours, at the rate of 30 gr. daily, if the patient is unable to take the drug by mouth. Surg. Lieut. Sneddon does not mention any quinine given by the oral route. Experience after the fall of Rabaul showed us that oral quinine, if it could be forced into the stomach when there was no vomiting, was almost as good as intravenous quinine in cases of cerebral malaria, but more than 10 gr. daily are needed whatever route is employed.

Of course quinine haemoglobinuria must be watched for, and if this occurs atabrin must be given with increased fluids, intravenous or otherwise. The hesitation displayed by some practitioners in giving adequate doses of quinine in severe cases of malignant tertian malaria for fear of precipitating black-water fever is not warranted, at least in the south-west Pacific area. Whether or not this was the case in Surg. Lieut. Sneddon's patient is not disclosed. I feel certain that more quinine would have modified the prognosis of the case described.

My apology for this letter is that grave emergencies, whether medical or surgical, need a bold approach. The dictum of *primum non nocere* can well be replaced by "needs must when the devil drives."—I am, etc.,

Sydney, N.S.W.

C. LELEU.

### Treatment of Sciatica

SIR.—Sir Arthur Hurst, whose article on sciatica appeared on Dec. 18, 1943, could learn a great deal from a personal attack. His pronouncement that simple rest and confidence will easily cure in most cases is belied by medical experience. His "rational treatment" of rest for a month supported by pious hopes, then rest for another month supported by more pious hopes, and then, if no better, handing over to the neurosurgeon with, presumably, apology for pious hopes expressed, and eventual labelling as hysteric, hardly deserves to be termed "An Essay in Debunking," its conclusion providing rather the escape for the frustrated physician confessed by Hale White.

The great variety of treatments condemned by Sir Arthur Hurst implies not, as he believes, that they cure by suggestion but that they generally do not. Sciatica is a symptom, its causes are divergent and by no means completely understood. The patient in an exceptional case of my own experience, who had endured a plaster-of-Paris jacket, developed a sarcoma of the buttock five years later, followed by glandular sarcoma in the abdomen and the neck: repeated x rays had been entirely negative, but she never lost her pain. A premature pronouncement that the condition is a neurosis is likely to prove obstructive to thought by the doctor, with the temptation to accept an inactive course and to leave the patient to his fate. It is an unpleasant fate. Personal experience as a doctor and as a patient has taught me some points about sciatica.

1. Vibration is particularly unpleasant, whether it occurs in bus, train, or motor car, or merely from the heavy tread of a foot in the patient's room. This suggests that vibration may be an important causal factor where a position is long maintained (as in lorry or car driving with badly designed seat).

2. The patient tends to find a position that is comfortable and to maintain that position too exclusively for the good of his musculature; often the sciatica patient can only lie on one side or cannot lie on his back or prone with comfort. This pain-dodging factor continued over a long period of time with the general weakening of muscle from recumbency accounts for the "hysterical posture" of Sir Arthur Hurst's beliefs.

3. The emotional mind-disposition towards pain is *post hoc* not *propter hoc*. It is the natural consequence of unremitting pain. It is not the severity of pain but its tiresome prolongation which wears down the patient, a descent which is accentuated by the crippling effect of any upset of the pelvic skeletal structures, for it greatly handicaps any enterprise except reading. The patient is reduced to "listening in" to his pains. He finds himself compelled to shift his leg with tiresome frequency; even the pressure of one leg on the other is uncomfortable in acute cases. This is best relieved by a ring of bandaged wool between the knees, not by a pillow.

4. There are probably elements of muscular spasm, similar to the rectus protection of the acute appendix. Such a position as approximation of the soles of the feet is temporarily relieving, though difficult to maintain; no doubt it has a splinting effect. To hang the whole limb in a sheet to swing it just clear of its opposite member helps to give comfort.

5. General examination should be thorough; history carefully taken. Such factors as neoplasm, high uric acid in the blood, antral or prostatic infection, may be discovered. Blood count and blood sedimentation should be taken.

6. Muscles of back and limbs should be conserved as carefully as may be. The mattress should be firm and should not sag; the bed should be of adequate length.

Theoretically it is probable that pelvic and spinal strains, supported by inadequate muscles, are largely responsible for the origin

of sciatica, and it is possible that vibration accentuates this ill effect. Prolonged sitting, especially in a badly constructed or hard motor seat, seems to give rise to trouble. The upright position has sciatica as one of its penalties. On general principle of justice it is unfair to condemn the sciatic soldier as a malingerer without complete examination and the utmost certainty. It is pertinent to ask what pathology precedes the herniated disk. Sciatica commonly goes as it comes; we know not why. An ostrich-like pretence that it's all quite simple will not help us.—I am, etc.,

GEORGE H. ALABASTER, M.D., F.R.C.S.Ed.  
East London, C.P., South Africa.

### Ketosis in Children

SIR.—The observation of Dr. F. B. P. Evans (March 25, p. 432) on the prevalence of ketosis in children and the letter from Dr. George Bray (April 8, p. 503) prompt me to request again the courtesy of your columns.

You were kind enough to publish a letter of mine in the *Journal* of May 1, 1943, in which I drew attention to the frequent occurrence of ketosis in children below the age of 6 suffering from asthma. Several doctors have written to me describing their success in treating asthma in young children by diminishing fat intake and prescribing glucose drinks and alkagen granules.

It is interesting that Dr. Evans has confirmed my observation that ketosis frequently follows a period of nervous excitement, and it is my experience that an attack may be prevented by giving a child who has been unduly excited or has had some nervous strain glucose drinks and an alkali. An asthmatic attack is one of many symptoms a child may show, the most common being, as Dr. Evans points out, simple pyrexia up to 104° F. with nothing to be found on careful examination except acetone bodies in the urine. Another sign almost always present is pale stools. They may precede the onset of pyrexia, abdominal pain, vomiting, or asthma.

Apart from the acute cases there are many children suffering from what might be called the state of subacidosis. The history obtained is that the child is fretful and discontented, "girling," and loss of appetite are conspicuous. Often the child is disobedient, bad tempered, and the mother expresses fear that her child is becoming spoilt. The youngster may be brought to the doctor as a suspected case of threadworms, or the doctor may be asked if enlarged tonsils and adenoids could be causing the trouble. The child usually resents examination, clinging to the mother and crying lustily. The urine with the sodium nitroprusside test shows a definite blue colour but not the dark purple found in the acute cases. The change within a few days when a low-fat high-carbohydrate diet is given along with alkalis is most dramatic. As one parent put it: "Betty is a new child and her sweet little self again."

I cannot agree with Dr. Bray that these children are allergic to fats, etc. Such children can be given fats provided sufficient carbohydrates are taken at the same time—butter with jam, syrup, or honey. Fats need be excluded only during an acute attack, and it has never been my experience that acidosis occurs as soon as, say, bacon fat or milk is added to the diet. The relief he has obtained by injecting 3 to 5 m of adrenaline 1:1,000 is most likely due to its action in converting glycogen into glucose, in the same way as adrenaline may relieve hypoglycaemia due to an overdose of insulin.

War conditions may contribute to this upset in children, but my view is that it is one which in the past has been seldom recognized. How often in taking histories one is told that a patient as a child had a weak stomach, or bad frequent feverish attacks, or was difficult to "bring up." As Dr. Bray remarks, many of the sick headaches and migraine attacks of later life may start with acidosis in childhood. Here, I think, the psychological factor comes into prominence. A belief in the inferiority of some organ is instilled into the child as the result of frequent upsets, causing much alarm to the parents, which, in turn, is transmitted to the child. So in later life we have the asthmatic, the dyspeptic, the migrainous, etc.

May I suggest the routine examination of the child's urine for acetone? It can be done at the bedside if the doctor carries the following in his bag: 1-oz. bottle containing pulverized sodium nitroprusside 1 part, pulverized ammonium sulphate 20 parts



1 oz. liq. ammon. fortis; 1 test-tube. To half a test-tube of urine add half-inch of mixed crystals, shake well. Add half-inch of liq. ammon. fortis and allow to stand. A characteristic purple permanganate colour results if acetone or aceto-acetic acid, or both, are present (Lawrence, *Diabetic Life*). Another method is described by Mr. John Ingram in the *Journal of April 8* (p. 512).—I am, etc.,  
Edinburgh.

ALISTAIR G. CRUIKSHANK.

### Parodontal Disease

SIR.—I am afraid I cannot agree with the opinions Dr. E. Wilfred Fish (Dec. 4, 1943, p. 726) expresses, and think it most dangerous to hold such views. The least osteitis round the apex of a tooth or periodontitis anywhere round a tooth is sufficient to cause fifth-nerve irritation, and may thereby damage vision in so many ways that hardly a day passes without my having patients' jaws x-rayed. After forty years of ophthalmic practice I can safely say that a large portion of my income has been created by conservative dentists.—I am, etc.,

Johannesburg.

A. G. BRINTON.

### First Aid according to St. John's

SIR.—My surprise at the tone of Dr. Lampard's letter (April 8, p. 505) is only surpassed by its contents, and the kindest thing that can be said is that the writer has failed to appraise the true value of the St. John textbook. He begins by wondering how many doctors use splints (referred to as "little bits of wood") for rendering first aid to a fractured humerus. The answer is surely every sufficiently energetic doctor who appreciates the need for the correct immobilization of fractures, not only to prevent further aggravation of the injury but also to lessen the effects of shock. The remainder of his queries all lend themselves to similar simple explanations, and reference to any standard textbook will serve to confirm the correctness and modernity of the St. John teachings.

The St. John textbook resembles other medical and surgical books in that it indicates the diagnosis and treatment of an "average" case, and on the assumption that the "average" appliances and remedies are available. Treatment may have to be modified according to the needs and circumstances of each particular case, and using the basic training as his guide, the experienced "first-aider" adjusts his treatment accordingly. The basic suggested treatment may not always be 100% efficient, but it is the best that can be carried out in the circumstances, and what more can one expect of other medical or surgical treatment?

The "first-aider" is taught to work within reasonable limits because he is a layman and not medically trained. The so-called "rigid limits" and teachings have the approval of a large number of our most eminent colleagues, many of whom are intimately associated with the Order of St. John and its works. They, moreover, produce uniformity, and prevent the letting loose of a horde of amateur doctors on the general public. Furthermore, the standard textbook is used throughout the British Empire and is printed in many languages. Its scope therefore embraces injuries which may not be common in this country, although encountered in the Dominions and Colonies. The very little extra trouble in learning about them is thus surely worth while.

There seems to be a general conception that there is a new technique in first aid as a result of "blitz" or war conditions, but, strangely enough, no one seems to know quite what it is. It is true we have learned an uncertain amount about crush syndrome, of more specific war injuries like phosphorus burns, of methods of transport depending upon the use of specialized apparatus which would not normally be available to "first-aiders," and we have also been issued with varying instructions regarding the treatment of burns. The fact remains, however, that basically first aid has not altered at all, and that the so-called modern improvements are merely a rehash of the teachings of the standard textbooks. Arrangements exist for an interchange of first-aid information between the Order of St. John and the various interested Ministries, and one may rest assured that those responsible for the first-aid policy of the Order are fully alive to modern conditions and needs.

Finally, if Dr. Lampard really wishes to transport the Knights of St. John from the days of the Saracens to those of General Montgomery, I would suggest that he sends his constructive criticisms and ideas to the appropriate authorities. I have no doubt they will receive appreciative consideration.—I am, etc.,

London, S.E.1.

M. M. SCOTT.

SIR.—I was delighted to read Dr. Lampard's letter (April 8, p. 505), for first aid is so important, especially in wartime, that instead of being a matter of 8 lectures and an examination it should be a minor science—progressive and sound. Whereas most techniques have progressed during the last half-century St. John's has remained almost unchanged. The reason for this stagnation is that hospital surgeons have not been in the habit of inquiring: "Was the casualty in this condition when you found him?"

There is hardly a single treatment in the St. John textbook, with the exception of the famous treatment for bites from a rabid dog, which is satisfactory and which could not be improved upon. Even the large arm-sling and the standard method of lifting are inferior to some of the newer methods. I have interested myself in first aid ever since I took my first St. John class in 1912, and during this war I have spent 1 or 2 hours every evening with the 10 first-aid points, the 2 first-aid parties, and the Red Cross Detachment and the St. John Division over which I have control. The Red Cross and the St. John require lectures annually in the methods laid down in their textbooks in order that the members may gain certificates and be entitled to wear the prescribed uniform. Whenever I give these lectures I impress on the class that the methods I expound are for examination purposes only, and are not to be used on actual casualties. After the examination I and the class spend a few evenings revising the newer methods which common sense and experience have proved to be more satisfactory.—I am, etc.,

R. C. C. CLAY.

### Shock Treatment of Mental Disorder

SIR.—May I, without giving offence, say that your question on page 537 of the issue of April 15 is nonsensical! If terms such as "material cells, tissues, or secretions," which are objectively derived, are mingled in one question with terms that are subjectively derived, such as "a sane outlook," you necessarily get a question that is unanswerable because of its form. The two sets of terms together do not make up a problem; they merely make nonsense. Sir Henry Bashford's attempts to state a relation between "cells" and "thinking" necessarily fail for exactly the same reason. No one who had traced for himself the derivation of his various convictions and ideas would attempt to state a relation in this form.—I am, etc.,

Liverpool.

K. W. MONSARRAT.

### Marriage and Parenthood

SIR.—Dr. Edward Griffith (April 15, p. 540) makes a praiseworthy plea for the profession to adopt a more enlightened attitude towards the many special problems of marriage. While I whole-heartedly agree with his main thesis, I feel that his approach to the question of contraception needs amendment.

Contraceptive advice may very rarely have to be given to a couple before the birth of their first child, but it should not be given under such circumstances with the readiness which Dr. Griffith's letter would seem to suggest. There are many reasons for urging that the aim of the newly married couple should be the immediate establishment of a family.

Completely satisfying coitus is a difficult art, while its achievement is a *sine qua non* of a successful marriage. The bride and groom can learn much from their respective parents, from their doctors, and from a very extensive literature (among which, incidentally, the doctor should be ready to guide them, for its quality is widely varied). But in the last analysis they must be guided by their instincts. The instincts are a fully adequate guide provided that they are given free rein. It is only when they are subdued and repressed that they fail. Even assuming the perfect contraceptive, which would offer no

physical interference whatsoever, the fact that a contraceptive is being used, the fact that coitus is being practised for some aim short of its full natural purpose, means that psychologically there are barriers to the full play of the instincts. The childless couple which copulates but avoids pregnancy copulates half-heartedly, and will probably never learn to do otherwise. Once the art of intercourse has been mastered, and once the couple has attained the fulfilment of actual reproduction, then the complication of a contraceptive can be introduced without fear of disharmony.

The change from the single state to the married state is a tremendous one, involving a mass of difficult psychological adjustments as well as physical ones. If a couple passes through this stage—which takes many months for its completion—and remains a unit of two, then a whole series of fresh adjustments are required when it becomes a unit of three. It is infinitely easier and happier if the first child arrives during the adjustment period, when it fits immediately into its parents' life. Couples which become completely adjusted as units of two tend to shirk the difficulty of further adjustment, and to postpone the establishing of a family—sometimes until it is too late.

The artificial production of sterility is comparatively easy. The removal of a natural sterility can be most difficult. I am constantly being grieved by my inability to help cases of sterility which have been long-hidden and have come to light only when it is too late to hope to do much. The woman of 34 or so who has married, who has "cleverly" avoided pregnancy for five years, who has then spent five disappointed years seeking pregnancy and discovering that she is not fertile, and who then asks for help, is a much greater problem than she would have been had she discovered her sterility eight years earlier.

Against all these factors the excuses usually adduced for postponing the first child weigh very lightly indeed. Unless there is some pathological condition in one of the couple contraindicating parenthood, let us therefore, when asked for contraceptive advice by the newly married, attempt first with our best endeavours to readjust their sense of values and to persuade them to postpone, not the child but the Dutch cap. We shall do them a service which will be, eventually, deeply appreciated.—I am, etc.,

West Bromwich.

D. SAKLATVALA.

### Service Medicine

SIR,—Your correspondent of April 1 (p. 470) gives, in my opinion, a very one-sided and misleading view of medicine in the Forces. True it is that the civil front carries far heavier burdens, generally speaking, than the Services, and is worse off for doctors. But I have served for four years, under all conditions of medical work from M.I. room to hospital establishment, and including a tour over-seas, and have never found evidence of over-staffing. There was adequate work for all in ending to both out- and in-patient requirements; and your respondent has not referred to the preventive aspects of service medical duties, the continuous attention which must be given to sanitation and hygiene, particularly over-seas. Limitation of working hours has, in my experience, been due to efficient distribution of duties rather than to a superfluity of medical officers.

It is to be deprecated that such condemnatory remarks about one's brother-medical officers should have been presented for publication. In this respect I should say that it is not always possible in the Service to give every doctor, immediately at any rate, the type of work in which he is most experienced. I have definitely not met with cases of consultant positions held by men with inadequate qualifications. Even if a medical officer finds that he does not know enough to deal with a case himself, he has, in the R.A.F. anyway, always got ready access to specialist advice and full hospital facilities. Even over-seas this was always the case.

Your correspondent shows a complete antagonism to what he terms bureaucracy, but what I should term supervision and administration. For the efficient working of any organized medical service a certain amount of paper work is essential both at the time and for future reference, including permanent records. Such measures do not impede attention to the patient;

rather do they ensure it. Without properly filled medical documents it would be impossible to keep a check on the patient at a later date.

So long as a Service doctor enjoys the commissioned rank to which his qualifications and subsequent experience make him entitled, there seems no reason why he should resent being subject to confidential reports, like any other officer. Such reports on a medical man pass through medical channels.

I have never found any difficulty in obtaining or exchanging equipment, except when bad communications or shortage of supplies caused delay. Local supplies of drugs were never unobtainable. Mobile squadrons carry a more than adequate quantity of instruments, etc.

Far from being in the most browbeaten and the least organized branch, I have found that the Service medical officer, however junior, wields considerable power, and if he is in any way gainsaid he can readily seek the aid of his seniors, even if the case amounts to a revision of existing policy. Your correspondent, of course, does not reveal in which medical service he is employed, and my answers to his statements are largely based on my experience in the R.A.F. I consider that the excellent attention, both in preventive and curative medicine, given to Service personnel is a perfect example of "the community ideal of service for others."—I am, etc.,

E. HOPE LAMB,  
Squadron Leader, Royal Air Force.

## Obituary

DR. JOHN FREDERICK VENABLES died suddenly in London on March 31 at the age of 56. He was educated at Magdalen College School and Magdalen College, Oxford, and went on to Guy's Hospital for his clinical course. He graduated B.M., B.Ch. in 1913, proceeding D.M. in 1924. He served with the R.A.M.C. in Egypt during the last war, but was invalided home and became second in command of the Seale Hayne Military Hospital for functional nervous diseases. After the armistice Dr. Venables was in charge of a hospital for war neuroses under the Ministry of Pensions. In 1921 he went to join Sir Arthur Hurst again, as physician to the New Lodge Clinic at Ascot; when the clinic closed soon after the outbreak of the present war he rejoined the R.A.M.C., and reached the rank of temporary major. Increasingly frequent attacks of angina pectoris compelled him to resign his commission in June of last year, but in October he became a medical member of the first of the new pension tribunals.

The death occurred on April 8 at Thoraby, Wensleydale, of Dr. JOHN JAGGER PICKLES, fourth son of the late Dr. J. J. Pickles of Leeds. He was born in 1888 and graduated at Leeds University in 1912, serving in the last war and being wounded on the Somme. From 1919 to 1937 he was in practice in Leyburn, but retired in the latter year for reasons of ill-health. During the present war he pluckily returned to work, but finally broke down in health a year ago. He was a bachelor, and fond of country life and the natural history of the countryside. He joined the B.M.A. in 1919.

DR. WILLIAM EDWARD BENNETT, for 50 years M.O.H. at Otley in Yorkshire, died on April 10 at Knaresborough, aged 84. A native of Otley he studied medicine at Leeds and took the Scottish triple qualification in 1886. During his early days as a general practitioner in Wharfedale Dr. Bennett used to make his rounds on horseback. He had an absorbing concern for the welfare of the town and everyone in it. It has been said of him that he was the very pattern of the family doctor, diligent in everything except sending in his bill; and if he had once had people under his care he never lost interest in their progress. When he retired from strenuous private practice at the age of 60 it was merely to take up fresh work; for the next ten years he spent six out of every twelve months at sea as a ship surgeon; on his return from winter voyages he attended the Women's and Children's Hospital at Leeds and also assisted at a Barnsley hospital. To celebrate his jubilee as medical officer for Otley, past and present members of the local council and officials made him a presentation in recognition of his valuable service, which had changed the town so much from what it was in 1887. In 1940, at the age of 80, Dr. Bennett enrolled in the E.M.S. and was passed as fit for duty and appointed to an emergency hospital.

The Rev. JOHN COOK TENNANT, M.D., who died in Fife last year, was a man of much versatility. Born at St. Andrews 1860 he attended the Madras College and then took the A. degree, and a full theological course at St. Andrews, and after being licensed by the Church of Scotland went to charge in Australia. A complete change of attitude towards religion caused him to take up sheep farming, and a ranch became the centre of his activities for 18 years. Then at the age of 43 he returned to start life anew as a medical student in Edinburgh, graduating M.B., C.M. in 1908 and M.D. in 1910. He left Edinburgh for Melbourne and set up as a psychiatrist in Collins Street. In the last war he worked at various military hospitals, mainly among cases of "shell-shock." After the war he became a ship surgeon. During the last 15 years of his life Dr. Tennant underwent a profound spiritual change, the agnosticism and critical views of his earlier years being replaced by a simple faith.

The following medical men have recently died abroad: Dr. HENRY GRAY BARBOUR, professor of pharmacology at McGill University in 1921-3 and afterwards at Yale, aged 57; Dr. LOUIS LANCHEIRO WILSON, a notable pathologist and medical educationist at Rochester, Minnesota, aged 76; Col. ROY DENNIS, chief of the neuropsychiatric branch, U.S. Medical Department, aged 40, of coronary thrombosis; Dr. HANS WERNER BÜHLER, ophthalmologist at Geneva; Dr. M. CHIFOLIAU, senior surgeon to the Hôpital Saint-Louis, Paris; and Geh-Rat WALTHER KRUSE, bacteriologist and emeritus professor of hygiene at Bonn, Königsberg, and Leipzig, aged 79.

## Universities and Colleges

### UNIVERSITY OF GLASGOW

A graduation ceremony was held on April 15, when the following medical degrees were conferred:

M.D.—J. H. Lawson, Janet F. Morrison, J. P. Currie, A. M. Sutherland, W. L. Milligan.

The following prizes among others were awarded:

University Prize—Bellahouston Medal: G. H. Bell.

Special Class Prize—Surgery, Macleod Medal: J. B. Ritchie.

1 With honours. 2 With high commendation. 3 With commendation.

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a quarterly meeting of the Council held on April 13 with Sir Alfred Webb-Johnson, President, in the chair, the following elections were made to the Court of Examiners: Mr. Seymour Barling, re-elected for one year; Mr. Alan Perry, re-elected for two years; Mr. E. A. Crook, elected for three years. Brig. Ashley Daly and Dr. M. H. Jupe were elected Fellows under the Charter, which permits the Council to elect annually to the Fellowship, without examination, two members of twenty years' standing. The Jacksonian Prize for 1943 was not awarded on this occasion. The subject for the Jacksonian Prize for 1945 will be "Bone Grafting in Surgery: Its Indications, Methods, and Results." Votes of thanks were given to the President for the gift of a collection of engraved portraits, to Mr. G. H. Colt, F.R.C.S., for a mounted Brodie Medal, and to Mr. Richard C. Davis for a gift of money.

Diplomas in Child Health were granted, jointly with the Royal College of Physicians of London, to the following candidates:

T. J. Agius-Ferrante, Isobel C. Allardice, Evelyn A. Bishop M. Bojko-Uncar, Peniel M. E. Chiny, Norah H. C. Clark, Sheila Cochrane, J. W. Fletcher, Margaret D. Giles, Janet D. Gimson, Irene D. M. F. Castlow, E. Lewis, M. G. Philpott, Helen S. Standley, T. Stapleton, Pauline Wynne.

Three Hunterian Lectures will be given at the College (Lincoln's Inn Fields, W.C.) on Monday, Wednesday, and Friday, May 1, 3, and 5. All the lectures begin at 4 p.m. and are open to advanced students and medical practitioners.

### ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

The following candidates, having satisfied the examiners, have been awarded the Diploma of the College:

Caroline D. Baugh, Marjorie Bryan, M. Dods, J. S. Hogg, E. C. Housden, D. Laito, Mary E. Long, Helen M. Mayer, Marjorie L. Penwill, J. R. F. Poppellwell.

### CONJOINT BOARD IN SCOTLAND

The following candidates, having passed the final examination, have been admitted L.R.C.P.Ed., L.R.C.S.Ed., and L.R.F.P.&S.Glas.:

M. H. S. El Amroussi, S. B. Ballantine, G. W. Barker, Doris E. N. Bleasby, S. Datzel, R. E. McIl, Dunlop, J. W. Edmondson, L. M. G. Gussak, D. Headley, A. M. Herman, R. Keane, D. Munn, K. S. Mowatt, H. A. Munro, R. J. McClements, A. R. MacKinnon, D. Nathanson, A. C. Farnell, C. J. K. Piyso, K. A. Said, Abd El Monem El Sebeldi, L. I. Stirling.

M. Balint, M.D. Budapest, a graduate of a recognized foreign University, was also admitted a licentiate.

## The Services.

The *London Gazette* has announced the appointment as M.B.E. (Military Division) of Temp. Surg. Lieut. D. K. T. Wallace, R.N.V.R., for outstanding bravery and devotion to duty in tending the wounded during an air raid.

Col. W. K. Morrison, D.S.O., late R.A.M.C., Major (Temp. Lieut.-Col.) T. F. Briggs, and Capt. J. G. Pyper, R.A.M.C., have been mentioned in dispatches in recognition of gallant and distinguished services in Malak.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in the Middle East: Major-Gen. (Acting) W. H. Ogilvie; Brigs. (local) D. E. Bedford, G. MacDonald, and S. Smith, K.H.P.; Col. (Temp.) R. Murphy, C. Popham, O.B.E., and A. E. Richmond, O.B.E.; Col. (Acting) T. S. Law; Majors (Temp. Lieut.-Cols.) P. Carney, M.C., J. B. George, J. S. Jeffrey, C. A. Levy, N. MacLeod, J. E. Measham, J. S. Miller, R. W. Scott, A. P. Trimble, and H. L. Wallace; Capt. (Temp. Major) (Acting Lieut.-Col.) J. Pyle, M.C.; Capt. (Temp. Majors) K. G. A. Barlow, M.B.E., A. Crerar, D.S.O., M.C., G. C. Dansey-Browning, W. S. Gale, A. G. R. Lowdon, J. D. MacLennan, H. A. Palmer, L. S. Rogers, M.B.E., J. Urquhart, and C. E. van Rooyen; Capt. (Acting Major) R. S. Turner; Capt. K. MacK. Bell, E. L. Farrow, R. Fletcher, S. G. McK. Francis, S. T. Headley, T. M. Lennox, A. D. Morgan, P. A. Petrides, B. W. Powell, J. W. T. Pretsell, M.C., K. Simon, J. W. Spence, W. W. Willson, and G. Wilson, R.A.M.C.; Capt. (Temp. Major) C. W. Greene, Capt. V. Parkash, Subadar M. Y. Shah, Jemadar S. P. Redkar, Cdr (Assistant Surg., 1st Class) W. Bornshin, I.A.M.C.; Capt. H. Fine, R.C.A.M.C.

The *London Gazette* has announced the award of the D.S.C. to Temp. Surg. Lieut. E. O. Davies, R.N.V.R., for great courage and devotion to duty in caring for the wounded during landings at Salerno; and Temp. Surg. Lieut. J. A. Henderson, R.N.V.R., has been mentioned in dispatches for courage and skill in H.M.S. *Chanticleer* on convoy escort duty.

The Efficiency Decoration has been conferred upon the following officers of the Territorial Army: Col. J. Carver; Lieut.-Col. (Temp. Col.) J. T. McQuat, O.B.E.; Lieut.-Cols. F. A. Belam and T. A. S. Samuel, N.C.; Majors (Temp. Lieut.-Cols.) J. H. Dunn, J. B. S. Guy, W. A. Mackey, D. J. MacMyn, J. K. Steel, G. Sparrow, M.C., and G. D. Thompson, R.A.M.C.

The Order of the Red Star has been conferred upon Surg. Lieut. G. H. Murray, R.N.V.R., by the Presidium of the Supreme Council of the U.S.S.R. for services to the U.S.S.R.

The initials of Capt. (Temp. Major) A. G. R. Lowdon, R.A.M.C., are as now given and not as stated in the *London Gazette* of March 23, and in the *Journal* of April 1 (p. 475).

### CASUALTIES IN THE MEDICAL SERVICES

Killed.—War Subs. Capt. J. B. Ashmore, R.A.M.C.

Prisoners of war—Lieut. G. Blair; War Subs. Capt. F. E. Butterfield and C. D. Chilton, R.A.M.C.

## Medical Notes in Parliament

### Medical Officers at Military Prisons

Setting out on April 5 the progress made in implementing the recommendations concerning the Army, which were submitted by the Oliver Committee on Military Prisons and Detention Barracks, Sir JAMES GRIGG said that owing to the shortage of medical officers it was impossible at the present time to appoint a whole-time medical officer for each establishment. Steps had been taken to ensure that a medical officer was available at each establishment when required. At each of the five larger establishments one was attached for full-time duty. Sick quarters were now installed in all military prisons and detention barracks, except Aldershot. There the quarters should be completed shortly.

### Investigation of War Diseases

Sir Arthur MacNalty, who is Editor-in-Chief of the Official Medical History of the War, informs Mr. Willink that selected hospitals are co-operating fully in an investigation which is proceeding concerning any changes in types of disease that may be occurring during the war as compared with a typical peace year, and that the Service Departments are obtaining medical data relative to the campaigns in all theatres of war. Statistics concerning infectious diseases are being furnished by the Registrar-General.

### Germany's Chemical Industry

In the House of Lords on April 18 Lord VANSITTART asked the Government whether, in view of the paramount necessity for permanently preventing the manufacture of all explosives in Germany after the war, they would appoint a committee of scientists to prepare a practical and efficacious scheme, with particular regard to the control or elimination of Germany's nitrate and hydrogenation plants.

Lord HORDER, speaking as a doctor, said it was clear that the Nazis' long and devilish preparation for an all-out war included more things than killing human beings by explosives: it included preventing the cure of human beings who fell sick of disease. For a long time before the war the Nazis deliberately cut down to starvation-point the manufacture by other countries of chemical substances vital to the pursuit of medical science and treatment. He referred to two essential drugs. The first was suramin, which the Nazis—surely with their tongue in their cheek—called Germanin. They prevented countries other than their own from using it. It was made by Bayer as the result of a secret process, and was of great use in the treatment of sleeping sickness. Still more important was the synthetic drug called atabrin, the equivalent of quinine. This was also a Bayer product. Both the constitution and the mode of preparation were kept secret for a long time, and the supplies outside Germany were very strictly limited.

At the outbreak of war, of course, these supplies ceased. No doubt we relied on the natural product, quinine, obtainable in quite large amounts at that time from the Netherlands East Indies. When that supply failed us we were caught out very badly. To what degree we were caught out only those responsible for the health of the armed Forces and of our people in the Dominions and particularly in India, and for the treatment of hundreds of thousands of cases of malaria, really knew, and this in spite of the quite valiant efforts which our own big chemical industries had made to help us.

It was clear, therefore, that a full inquiry by expert chemists should be undertaken into the whole field of synthetic chemical industry in Germany. Then, in conjunction with our allies and political experts, some plan should be devised whereby the manufacture of explosives in Germany could be entirely prevented, and a strict lien over and control of essential drugs by Germany ended.

Lord CHERWELL, replying for the Government, agreed that if we could prevent Germany from making synthetic nitrates we could prevent her making war—in the present state of knowledge. Nitrogen, however, was the essential element in proteins, which were necessary for food. In a modern world we had very largely replaced the bacteria in the roots of certain plants capable of fixing nitrogen and putting it back into the soil by the synthetic fertilizer. The difficulty was that if we stopped Germany making synthetic nitrate or ammonia there would be difficulty in getting fertilizers for Central Europe. Every effort should be and was being made to find out if there was a way of circumventing this difficulty. The same applied to the question of hydrogenation. Lord Horder's statement that the Germans had got exclusive control of certain drugs, and that when these supplies were cut off we were left in a bad way, was perfectly true. That was the reverse side of the medal, and it implied that we ought to make sure that we had sources of these drugs rather than stop the Germans making them. These questions required study and consultation, and various committees had been considering them and had recommended that more scientists should be invited to join in their investigation. We could not decide these matters alone; we had first to form views of our own and then discuss them with our allies. The Government agreed that the time had come to extend the participation of scientists in these questions, and proposed to invite a greater number of professional scientists and experts to take part in the deliberations. The more questionable proposals also of supervising German research would not be forgotten.

### Issue of Questionary and White Paper

On April 18 Sir E. GRAHAM-LITTLE asked the Minister of Health whether he had co-operated with the B.M.A. in the issue of a questionnaire to registered medical practitioners, otherwise than by supplying, without charge, copies of the White Paper to accompany it; what was the number of copies so supplied; at what cost and to what account was it debited; and whether he was consulted in the preparation of the questionnaire or the procedure of its distribution. Mr. WILLINK: It was, quite properly, never suggested that I should participate in any way in the preparation or issue of this questionnaire, which was entirely a matter for the B.M.A. With regard to the copies of the White Paper I decided that in view of the obvious importance of the Government's proposals to the individual doctor it would be helpful if I supplied a copy of it to

all practitioners in this country and in the Forces. The Association kindly undertook the distribution of these copies for me and, as a matter of convenience, distributed them with their own questionnaire and other documents. A total of 51,200 copies was involved, at the approximate cost of £950, which will be borne on the vote of the Stationery Office.

### Diphtheria Immunization and Notification

On April 18 Mr. ALFRED EDWARDS asked the Minister of Health what was his estimate of the number of children under 5 and between 5 and 15, who were inoculated against diphtheria down to the end of 1943; and if he would devise a method for removing from these records all children who reached 15 in 1940, 1941, and 1942. Mr. WILLINK said that the numbers of children inoculated against diphtheria in a given period by local authority arrangements were not estimates but figures supplied by the authorities of the numbers of children immunized in each six-monthly period. The totals of figures from January, 1940, to December, 1943 (the last yearly returns being not yet quite complete) were approximately 1,680,000 children under 5, and 3,136,000 between 5 and 15 at the date of immunization. The suggestion in the last part of the question would be very laborious to carry out, and he did not feel justified in adopting it.

## Medical News

Dr. T. L. Hardy will deliver the Croonian Lectures before the Royal College of Physicians of London on Tuesday, May 9, and Thursday, May 11, at 4 p.m. Subject: "Order and Disorder in the Large Intestine."

The mass miniature radiography unit which is being set up by the Leeds Corporation to aid the early detection of tuberculosis will have its headquarters in St. James's Hospital, where rooms and offices are now being prepared. When in full operation the unit whose personnel consists of a medical director and assistant, organizing secretary, and a team of eight radiographers, marshalls, and clerks, will visit factories in Leeds and the West Riding.

The London Hospitals Street Collections Central Committee announces that Hospitals' Day will be held on Tuesday, May 9. Suggestions and offers of service will be gratefully welcomed by the chairman, Lord Luke, at 36, Kingsway, W.C.2.

Six illustrated lectures on the historical background to modern medicine will be given by Mr. Douglas Guthrie, F.R.C.S., at the School of Medicine, Surgeons' Hall, Edinburgh, on Mondays and Thursdays, May 8, 11, 15, 18, 22, and 25 at 4 p.m. each day. The course is open to all students and medical practitioners.

A meeting of the Association of Surgeons of Great Britain and Ireland will take place on Tuesday, May 9, at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C. The following subjects will be discussed: caisson disease in joints; surgery of varicose veins; benign hypertrophy of the prostate.

At the annual meeting of the Westminster Hospital Ladies Association to be held in the Queen Mary Nurses' Home (entrance in Page Street) on Thursday, May 11, at 3 p.m., Mr. E. Roe Carling, F.R.C.S., will speak on "Journey to Moscow."

The Minister of Health has augmented the Ministry's staff responsible for visiting and advising hospitals on the best methods of preparing, cooking, and serving meals to patients and staff by the appointment of two women dietitians, Miss H. G. Cairney, M.B.E. and Miss M. R. Muriel. Miss Cairney, who holds a Dietetic Diploma, was from the outbreak of war until her present appointment, sister-in-charge at the L.C.C. diabetic unit at Hutton School, Brentwood. Miss Muriel was previously with the Ministry of Food part of her work was to report on hospital feeding, and she carried out surveys at several large hospitals. Since the setting up of the Emergency Hospital Scheme the Ministry of Health has been responsible for the treatment and care of large numbers of hospital patients. To assist in dealing with catering problems, it appointed Capt. J. Fraser, an expert in catering and kitchen equipment, since after the war started. He has visited over 300 hospitals, and wherever necessary, has made suggestions for improving the standard and quality of meals. Medical officers specializing in nutrition questions have also inspected emergency hospitals in many parts of the country. The advisory services of this special staff will be available to all types of hospitals—municipal and voluntary, as well as fever hospitals and tuberculosis sanatoria. So far as possible, they will cover the whole field of hospital catering—purchase of foodstuffs, choice of menus and diets, and the preparation, cooking, and serving of meals. In 1942 the Ministry issued for the guidance of hospital catering staffs a booklet called *Wartime Feeding in Hospitals*.

maintaining specimen diets and menus. The King Edward Hospital and recently appointed an advisory dietitian to assist voluntary hospitals in Greater London on dietary questions. Arrangements have been made to co-ordinate the work so that the Ministry's advisory service does not overlap with the activities of the Fund.

The preliminary programme for the seventy-fifth annual meeting of the Canadian Medical Association, to be held in Toronto from May 22 to 26, is published in the March number of the *C.M.A. Journal*. The president-elect is Dr. Harris McPhedran. A series of round-table conferences has been arranged for two of the mornings, followed by sessional meetings in the afternoons. At the first of the general sessions the outgoing president, Dr. D. Slater Lewis, of Montreal, will give his valedictory address, and the last general session will be devoted to a discussion on health insurance and allied problems.

The council of Epsom College will shortly proceed to award St. Anne's scholarships to girls attending Church of England schools. Candidates must be fully 9 and under 16 years of age, and must be orphan daughters of medical men who have been in independent practice in England or Wales for not less than five years. The value of each scholarship is dependent upon the means of the applicant and the locality and fees of the school selected. Forms of application can be had from the secretary's office, Epsom College, Surrey, and must be sent in by May 12.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* during the week the incidence of infectious diseases fell sharply. The decreases over the previous week in the notifications for the following diseases were: whooping-cough 583, scarlet fever 361, measles 300, acute pneumonia 274, diphtheria 170, dysentery 59.

The lowered incidence was general throughout the country. For scarlet fever London reported 54 cases fewer than last week, Yorks West Riding 43 fewer, and Lancashire 38 fewer; for diphtheria Yorks West Riding and Lancashire reported 34 and 25 fewer cases respectively; for whooping-cough Lancashire's notifications fell by 74, those for Yorks West Riding by 50, and those for Essex by 62. The fall in measles was mainly in the north; in the south the incidence went up slightly; Lancashire reported 131 fewer cases than last week, Essex 81, and Durham 55.

The only fresh outbreak of dysentery during the week was in Suffolk, Deben R.D., 16. The largest returns were those of London 48, Surrey 37, Lancashire 36, Cheshire 20.

In *Scotland* notifications of measles were 167 fewer than last week, diphtheria 50, scarlet fever 48, acute pneumonia 39, whooping-cough 27, and cerebrospinal fever 21. The incidence of dysentery rose by 17 cases, the chief centres of infection being Lanark County 30, Dundee 14, Edinburgh 13, Dumfries County 13.

In *Eire* measles notifications were 100 fewer than last week, whooping-cough 64, and diphtheria 17. 11 cases of typhoid were reported from Tipperary, Roscrea No. 1 R.D.

In *Northern Ireland* the notifications of diphtheria rose from 30 to 45; 15 of the cases were notified in Londonderry C.B.

### Quarterly Returns for England and Wales

The returns of the Registrar-General for the December quarter of 1943 show that the birth rate at 15.4 per 1,000 was the highest for a fourth quarter since 1930, the average for the five preceding December quarters being 13.6. Infant mortality was 51 per 1,000 live births, 3 below the average of the ten preceding fourth quarters. The general death rate was 14.6 per 1,000, this rate being 3.6 above that for the corresponding quarter of 1942 and 2.5 above the five-year average. The decline from the high marriage rate during the first war years continued, and the rate—13.3 per 1,000—was the lowest ever recorded during the fourth quarter.

**Returns for the Year.**—The provisional returns for the year are included in the returns. The birth rate was 16.5 per 1,000, and was the lowest rate ever recorded, being 2 below that of 1942, the previous lowest. The general death rate was 12.1 per 1,000, and was 0.5 above that for 1942 but 0.8 below that for 1941. The marriage rate was 14.3 per 1,000, the lowest recorded since 1926.

### Week Ending April 15

The returns of the notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,870, whooping-cough 1,865, diphtheria 616, measles 2,578, acute pneumonia 983, cerebrospinal fever 96, dysentery 179, smallpox 1, paratyphoid 2, typhoid 5.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 8.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever .. ..	78	5	17	3	5	92	—	36	7	11
Deaths .. ..	—	2	1	—	—	—	—	—	—	—
Diphtheria .. ..	554	38	151	102	45	729	49	185	89	33
Deaths .. ..	13	2	2	1	—	13	—	1	5	1
Dysentery .. ..	250	48	120	—	—	116	11	29	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	4	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	45	7	1	—	—	47	4	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	59	15	16	4	1	58	11	7	16	4
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Measles .. ..	2,343	324	269	306	10	18,056	1,059	792	38	317
Deaths .. ..	2	—	1	7	—	21	2	4	—	1
Ophthalmia neonatorum .. ..	92	6	14	—	—	74	3	25	1	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	2	1	—	—	—	3	—	2	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	1,003	63	8	7	6	1,290	90	15	10	15
Deaths (from influenza) .. ..	21	1	3	1	—	62	4	1	—	—
Pneumonia, primary .. ..	—	—	227	23	—	—	—	244	23	—
Deaths .. ..	—	51	—	20	7	—	60	—	6	16
Polio-encephalitis, acute .. ..	2	—	—	—	—	2	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polymyositis, acute .. ..	2	—	2	—	—	4	—	2	2	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	2	11	—	—	—	2	26	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	140	7	9	1	—	173	7	21	2	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	2,089	111	195	22	75	1,993	209	268	41	58
Deaths .. ..	3	1	1	—	—	2	1	—	—	—
Smallpox .. ..	1	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	9	3	—	13	—	6	—	1	5	5
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	3	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	1,558	204	89	24	15	1,954	168	268	23	18
Deaths .. ..	12	2	1	6	1	19	5	4	3	—
Deaths (0-1 year) .. ..	413	62	71	44	15	419	45	71	49	32
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	4,799	748	569	244	164	4,772	634	644	241	158
Annual death rate (per 1,000 persons living) .. ..	—	—	13.1	15.9	—	—	—	14.5	15.8	—
Live births .. ..	6,946	870	900	358	293	6,596	782	992	440	311
Annual rate per 1,000 persons living .. ..	—	—	18.3	23.4	—	—	—	20.2	28.6	—
Stillbirths .. ..	198	28	40	—	—	236	23	39	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	—	—	—	—	—	—	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.



## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Alitology Westcent*, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

### ANY QUESTIONS?

#### Fluid Intake and Toxaemia of Pregnancy

**Q.**—Patients who suffer from toxaemia of pregnancy are often advised to increase their fluid intake and to eliminate protein from the diet. Water retention plays an important part in the causation of peripheral oedema and of eclampsia (oedema of the brain). The level of plasma proteins is depressed. Would it therefore not be wiser to keep the fluid intake at a low level and not to restrict the protein content in the diet?

**A.**—There is much evidence in favour of the view that water retention plays an important part in the causation of eclampsia. There is, however, no general agreement regarding the cause of this retention, or as to whether the plasma proteins are lowered in eclampsia. It would seem advisable to limit fluid intake in pregnancy rather than increase it, as has been generally advised in the past, and many obstetricians now favour this course. It seems reasonable, too, in view of the fact that in established pre-eclamptic toxæmia with oedema, fluid and salt restriction is usual, in addition to rest to reduce the blood pressure. It is doubtful, too, whether protein restriction is beneficial in established toxæmias, especially in view of recent work on the part played by certain proteins and amino-acids derived from them in protecting the liver against necrotic changes.

#### Osteo-arthritis of Hip

**Q.**—Is there any form of treatment with which there is a reasonable hope of success in relieving osteo-arthritis of the hip—especially the pain of this complaint? Is gold treatment of any value? I see it is recommended for rheumatoid arthritis.

**A.**—Without a good deal more information, including x-ray evidence, this question cannot be answered satisfactorily. In some cases a calliper splint to put the joint at rest by separating the articular surfaces is desirable; in others, especially with severe pain, arthrodesis may be indicated. Good results have been obtained by injecting novocain saline in the vicinity of the joint, and lipiodol (now unobtainable, but similar preparations can be had) has been used with success; a certain amount of care and skill is required for a good result with this method. Apart from these methods ultra-short-wave diathermy sometimes gives relief but not always, and the same applies to deep x rays; either requires to be administered by someone with expert knowledge of the method. The usual analgesics may be employed, remembering always the danger of habit formation with many drugs of this kind in such a chronic condition. Gold treatment is absolutely useless in osteo-arthritis.

#### - Sawdust and Lung Disease

**Q.**—The manager of the export department of a firm of manufacturing pharmaceutical chemists tells me that an abnormally large number of men in the packing section of his department suffer from bronchial disorders, and that the men attribute this high incidence to the sawdust used in the packing. This dust is stamped down in the process of packing, and much of it flies about in the air surrounding the packers. Three cases lately mentioned by the manager as occurring among these packers were of bronchitis, asthma, and nicoplasm of bronchus respectively. The "*British Encyclopaedia of Medical Practice*" says that sawdust is one of the dusts whose liability to produce pneumoconiosis is unproved. Can you give any opinion about the desirability and the best, preferably unobtrusive, methods of preventing inhalation of the sawdust?

**A.**—Wood dust, when inhaled, irritates the upper respiratory passages, and the incidence of bronchitis among workers engaged in woodworking occupations which expose them to dust is somewhat in excess of the average. There is no evidence that pneumoconiosis or neoplasm of the bronchus is caused directly by wood dust. With sawdust of the soft woods, which are those likely to be used for packing bottles, the action on the respiratory passages is a physical

one, producing irritation by the rough surfaces of the particles, symptoms of chronic irritation and inflammation of the pharynx, larynx, trachea, and upper bronchi may be caused in susceptible persons. Dust of hard woods, such as beech, mahogany, and oak, is usually of smaller particle sizes and the deeper bronchi are affected. Certain woods, such as teak, are well known to cause severe symptoms in persons specially susceptible to them, but these woods are unlikely to be used as packing material. The possible presence of mould fungi in the wood may be kept in mind as a source of pulmonary trouble if sawdust from unsound wood or packing material which has been allowed to become damp is used. Apart from the provision of localized exhaust draught to remove the finer dust in the process of handling, which is probably the most effective in the circumstances, the wearing of a simple type of respirator would give a considerable measure of protection from the coarser dust. A suitable respirator could be constructed of a light wire frame with a few layers of gauze and worn over the nose and mouth; such respirators are available on the market.

#### Units of Penicillin

**Q.**—What are the units in use in the dosage of penicillin? American writers talk about doses of 25,000 units, and, in a course of treatment for early syphilis, a total of 1,200,000 units. Are these units the same as the "Oxford units"?

**A.**—Yes. The U.S.A. has adopted the Oxford unit, and standard preparation of penicillin provided from Oxford has been used for the assay of their products. This unit is a quantity which cannot accurately be defined in terms of biological effect; as in the case of so many other therapeutic agents which also cannot be weighed or otherwise measured, it can be expressed only as the activity contained in a given weight of a standard. While penicillin production is controlled as it is at present, the unit will remain reasonably constant quantity, and doses as stated in the present American and English literature can be taken to mean the same thing.

#### Sulphonamides and Fluid Intake

**Q.**—In the Medical Research Council War Memorandum No. 10 "Medical Use of Sulphonamides," pp. 40-1 (prevention and treatment of anuria, haematuria, etc.), it is advised to give about 5 pints of fluid in 24 hours to an adult to maintain a large urinary output of 2½ pints in 24 hours, and to perform cystoscopy if urinary output of 17 oz. persists for 24 hours; and on p. 14 it is advised to give sodium cit. gr. 20 and sod. bicarb. gr. 20 with the tablets. In the case of children, should the fluid intake, urinary output, and indication for cystoscopy and dosage of alkali given be calculated according to age of child and "quantity of urine passed by children daily" according to the table ("Clinical Methods," Hutchison and Rainey pp. 319 and 320) thus:

	Optimum Fluid Intake	Optimum Urinary Output	Dangerous Urinary Output	Dose of Alkali
If for adult ..	100 oz.	50 oz.	17 oz.	Sod. bic., sod. cit. 50 gr. 20
These ? for child :				
Aged 2 years ..	20 oz.	? 10 oz.	? 3 oz.	? Sod. bic., sod. cit. 50 gr. 3
Aged 4 years ..	26 oz.	? 13 oz.	? 4½ oz.	? Sod. bic., sod. cit. 50 gr. 5
Aged 8 years ..	40 oz.	? 20 oz.	? 7 oz.	? Sod. bic., sod. cit. 50 gr. 8

Are the amounts I have marked "?" the correct amounts to maintain to avoid toxic urinary reactions with sulphonamide treatment particularly with sulphathiazole?

**A.**—This question omits one essential factor which cannot be left out of account if it is desired to reduce the matter to absolute figures. This is the dosage of the drug. Granting, as stated in the authority quoted, that a full adult daily dose—say 6 g.—of the drug can be kept in solution in spite of acetylation provided that the daily output of urine be not less than 50 oz., then half that dose of the drug will call for a daily output of 25 oz. What matters, in fact, is the concentration of the drug in the urine. The dosage of alkali suggested appears satisfactory: the figure for "dangerous urinary output" may be calculated from the optimum, as has been done in the question.

#### Pituitrin for Herpes Zoster

**Q.**—The severe pain of herpes zoster (in my experience of 100 cases) is relieved in less than an hour by a hypodermic injection of pituitrin, but in neither case was the later and severe after-pain relieved. How does the pituitrin act? How was its action discovered? Is there any satisfactory remedy for the after-pain in these cases? I have heard of other cases relieved in the same way, but have personal experience only of two.

**A.**—The pituitary (posterior lobe) extract acts by lessening exudation from the skin capillaries, and so diminishing the tension which is the cause of the pain. Its action in diminishing exudation and

sedema, such as follows the application of mustard oil to the conjunctiva, or the subcutaneous injection of paraphenylenediamine, was demonstrated by L. T. Poulsen (*Arch. exp. Pathol. Pharmacol.*, 1927, 120, 120). The after-pain can be dealt with only by the usual analgesics such as aspirin, pethidine, or morphine.

### Miners' Nystagmus

**Q.**—It is widely accepted that the illumination provided at the coal-face in coal mines with the hand-lamps at present in use is not sufficient to maintain foveal vision throughout the "shift"; and that this is the chief aetiological factor in the production of miners' nystagmus. In an annotation in the "B.M.J." of March 4, 1944, it is stated that "foveal vision could be called into play in low intensities of illumination only if the light used were red in colour." If the coal face reflected, and pit dust absorbed, red light equally with white light, am I right in assuming that advantage might result from altering the present candle-power hand lamps from white to red light?

**A.**—It is possible that red light might be advantageous in the pit, though the coal face is not by any means identical with a luminous body of low intensity. What is more problematic is the role of foveal vision in mining, which is hardly "fine work" in the ophthalmic sense. Investigations during the past 20 years have tended to emphasize the psychological nature of miners' nystagmus, and little importance is now attached to low illumination as an aetiological factor.

### INCOME TAX

#### Expenses

E. V. asks what claims for professional expenses are recognized by the income tax authorities.

\* It is not possible to give a complete list here. In general the expenses that can be set against the gross receipts of a practice are those which can reasonably be said to be incurred in the carrying on of the practice and not for the benefit of the practitioner—e.g., cost of instruments and drugs. The practical difficulty is that a large proportion of expenses serve both purposes and have to be divided—e.g., rent and rates, cost of servants, telephone, car, etc. There is no clear guide to such a division; reason and common sense applied to the actual facts usually indicate the line fairly well. Expenses to be deducted by an assistant from salary are restricted by the requirement that they shall be necessarily incurred in the course of the employment; this renders ineligible professional subscriptions (unless membership of the Association is a condition of the employment) and the cost of travel between home and the place of work.

#### Annuity Payable by Insurance Company

A. P. wishes to know his position in respect of an annuity starting with a guaranteed period of  $\frac{1}{2}$  years whether he lives or dies.

\* If there is a single contract providing for a fixed payment for  $\frac{1}{2}$  years followed by an annuity terminating at death, the position is, in our opinion, at least doubtful. But a contract for a fixed period would apparently carry income-tax liability only as regards the element of interest in the payments made. Possibly what is contemplated is two separate contracts—one for a fixed term and another for life coming into operation as at the end of that period. A difficult question of law is involved, and the insurance company might be asked if they can guarantee their opinion.

#### Wife takes over Husband's Practice

M. M. has been in panel practice for many years, and following on the death of her husband has taken over his practice and added it to her own. Is this to be regarded as a new practice so far as M. M. is concerned?

\* Yes. M. M.'s liability will be based on (a) the profits of her old practice for the previous year plus (b) the profits of the husband's practice on the current year's basis, until she has held it long enough for the previous year's basis to operate for both.

#### Appointments: Travelling Expenses

"ERSILON" is employed by the E.M.S. as a full-time physician, but holds two honorary appointments in addition. He has to travel to the hospitals concerned, but has been refused a deduction for the cost of maintaining a car for the travelling.

\* This is legally correct. Where several appointments are held, the emoluments being assessed under Schedule E, the expense of travelling to the place where the duties are performed has been held by the courts not to be "incurred wholly, exclusively, and necessarily in the performance of the duties of the office."

#### Correction

The reply to "J. F." published on Feb. 19 as the first item on page 278 contained a clerical error: the figure at the end should be £30, not £50.

## LETTERS, NOTES, ETC.

### Strychnine and Field of Vision

Mr. H. M. TRAQUAIR, F.R.C.S. (Edinburgh), writes: On page 207 of the *Journal* of Feb. 5 it is stated that strychnine "causes a measurable increase in the field of vision." This statement appears in textbooks of pharmacology, but is based not on recent research but on observations dating from the work of von Hippel in 1873, followed by others. The evidence is contradictory and inconsistent, and one writer at least was entirely sceptical; certainly some of it is completely incredible. Is not this an example of the repetition of statements without proper scrutiny or criticism? It is difficult to believe that any drug can "increase" the field of vision in whatever sense the word "increase" may be used.

### High Birth Weights

Dr. FRANK CROSBIE (Ealing) writes: The expert who dealt with this question (April 8, p. 510) might be interested to know that on Dec. 10, 1927, my wife gave birth to male twins. G. weighed 7 lb. 6 oz., A. weighed 8 lb. 4 oz., a combined weight of 5 oz. more than the case to which he refers. Both are now Dartmouth cadets, G. weighing 11 st. 2 lb., height 5 ft. 9½ in., A. 9 st. 10½ lb., 5 ft. 8½ in.

### Excessive Sweating

Dr. A. J. AMBROSE (Paignton, Devon) writes: Your answers in the "Any Questions?" section (March 18, p. 412) on excessive local sweating will not satisfy many dermatologists nor the R.A.F. officer who is the victim of this distressing complaint. Like the Frenchman who, when asked on a cross-channel steamer if he had lunched—I would say, "Au contraire" to your advice to avoid x rays. Roxburgh in *Common Skin Diseases* says that no local treatment can cure, and that the usual practice is to give 3/4 pastille dose once a month until the condition is nearly cured, stopping short of cure so as to avoid the danger of producing too dry a skin. I agree with you that this great danger must be avoided, and it will be avoided if the work is carried out by an expert radiologist, especially if he is a dermatologist as well. If, however, the R.A.F. officer is nervous of trying 3/4 pastille dose, then he might get a good result with 1/4 pastille dose at weekly intervals. In addition to the excellent suggestion of bathing with hot water, R.A.F. might like to try acid. salicyl. gr. 10, pulv. alum. 1/2 oz., pulv. chalk 1/2 oz.; or acid. salicyl. 3%, acid. borie, 10%, French chalk ad 100%; or alum gr. 48, liq. formaldehyd. n 24, lanette wax gr. 33½, ung. acid borie gr. 142½, ung. zinc. ox. gr. 234. Light open-weave underclothing—and he should be advised not to take drugs such as atropine, or belladonna internally, as these are useless.

### Conditions in Detention Barracks

Dr. F. ALLEN writes from Poona: I have often wondered why prison and detention barracks, etc., in the British Isles do not follow the Indian example of having medical superintendents or governors or wardens or whatever name sounds best. I have been a jail superintendent and also jail M.O. for a combined period of nearly 10 years with breaks. The medical superintendent can so easily spot the men who are ill and is in a better position to deal with the malingers. I endeavoured always to admit a man or woman to hospital before he or she fell ill. I could vary the jail or individual diets to suit the case. I was working on my health statistics, but recall to military duty spoilt the sequence. I am all for a medical superintendent in the interests of humanity and of the prisoners, and I believe it is also to the benefit of the State.

### Breathing Exercises

Dr. L. SHELTON (Harlesden, N.W.10) writes: Some years ago, while acting as first assistant to Mr. Radcliffe (late surgeon E.N.T. Dept., Queen's Hospital for Children, Hackney) I noted that numerous children who had had their tonsils and adenoids removed still breathed badly—they were, in fact, still bad mouth-breathers. I suggested that these youngsters be taught to breathe correctly and that a skilled teacher be appointed with this object in view. Mr. Radcliffe agreed. I note now that most hospitals have skilled teachers who are doing excellent work in this field. Many mothers have, however, complained to me of the time wasted in travelling to hospital, so I venture to suggest that this work be undertaken at schools. The "war effort" would thus be helped (mothers have to have time off from work) and no schooling would be lost to the children.

### Detecting Trichomonas vaginalis

Dr. R. E. REWELL (Coulson, Surrey) writes: Under the heading of "Any Questions?" on April 8 I see you state that the *Trichomonas vaginalis* "can be detected by examination of a fresh specimen with a dark-ground microscope." This phrase seems to me to be unfortunate, as those inexperienced in the examination of discharges for

the presence of this organism may be led to suppose that the elaborate set-up for producing dark-ground illumination (as in the search for *Treponema pallidum*) is required. In fact, all that is required is that the condenser of the microscope be racked well down so as to produce a darkened background, just as is done during the enumeration of blood cells. A wet preparation of the fresh material is made, warmed for a few moments, and then examined with the ordinary 2/3-in. and 1/6-in. objectives. The organisms, with their pear-shaped bodies, anterior flagellae, and lateral undulating membranes, are easily seen among the immobile pus and epithelial cells of the vaginal discharge. I have no experience of searching for them in the male, but feel that they could be readily distinguished from spermatozoa by the most inexperienced. No other organism resembling them is likely to be found in the vagina or urethra. I feel that your phrase should be modified, as otherwise specimens may be sent long distances to laboratories equipped with dark-ground apparatus instead of being examined in the consulting-room, a thing anyone can do who still retains the microscope of his student days. The *Trichomonas vaginalis* is sure to die *in transit*, and then the examination is wasted.

#### Coincident Inflammation of the Hip-joint in Two Children

Dr. C. LL. LANDER (Maiden Newton, Dorset) writes: Two children, a girl of 5 and a boy of 3½, went to a tea-party in the village where they live at which a considerable number of children were present. Three weeks later they were seized with symptoms pointing strongly to acute inflammation of the hip-joint (infective osteomyelitis). First, the girl, who complained of pain in the left knee. She had a temperature of 103°, and lay with the thigh abducted and semiflexed. Any movement was excessively painful, the whole pelvis moving with the thigh en bloc when movement of the joint was attempted. Two days later the boy presented similar symptoms except that there was no pain referred to the knee. I treated both with sulphanilamide 0.25 g. tablets. The girl, owing to inefficient nursing, took only one tablet and parts of two others on the first day, but was decidedly improved thereby; six more tablets on the second day relieved the symptoms entirely; a further dose of four tablets was given on the third day. The boy had six tablets on the first day, followed by four on the second and third days. All pain and fixation of the joint had by then disappeared, and it was difficult to keep the child in bed any longer. In fact the parents gave me a broad hint that further attendance from me was hardly called for. These cases are unique in my experience, first, because of the apparently common source of infection and, secondly, on account of the dramatic way in which the symptoms completely disappeared.

#### Two Suggestions in Clinical Examination

Mr. K. WILSON JAMES, F.R.C.S.Ed., sends the following notes from Kingston, Jamaica: (1) *A Percussion Test in Acute Lower Abdominal Conditions*.—As an aid in the differential diagnosis of lower abdominal conditions this simple test is sometimes very useful. It consists in lightly percussing over certain areas and asking the patient to state the point of maximum pain. For example, the left hand is placed on the lower abdomen with the index and middle fingers separated to form a V. The tip of the index finger is made to rest over the internal inguinal ring and that of the middle finger over McBurney's point. On percussing, the site of maximum pain in acute adnexal conditions will be found to be over the internal ring, whereas it will usually be in the region of McBurney's point in acute appendicitis. (2) *A Three-finger Examination in Obscure Pelvic Cases*.—With the patient in left lateral, Syn's, or dorsal position as may be found most suitable, the index and middle fingers are introduced into the vagina and the lubricated ring finger into the rectum. The thumb then rests upon the pubis and the little finger upon the perineum. Thus the whole hand assumes a natural position, and an extremely thorough bimanual examination of the pelvis is possible with the aid of the other hand. There is the feeling as if the whole hand is inside the pelvis, and this manoeuvre is worth trying in difficult pelvic examinations and in obscure cases.

#### Swallowed Plastic Button undetected by X Rays

Dr. J. A. STEPHENS (Kirkburton) writes: On Nov. 29, 1943, a rather worried mother brought her baby, aged 7 months, to see me on account of the following circumstances. That morning on going to look at the child in his pram in the garden she noticed that the second button of his woollen cardigan was missing. She had noticed the child sucking this particular button, which was attached by wool, on a few occasions. She hunted high and low for the missing button but failed to find it, and assumed that the child had swallowed it. Three similar buttons were still attached to the coat. They were made of some smooth plastic material 5/8 in. in diameter and about 1/8 in. thick. I advised the mother to watch and examine the child's stools carefully for the next few days. By Dec. 3 the button had not been found, and so I sent the child for x-ray examination, instructing the mother to take the coat as the

radiologist would wish to test the opacity of the buttons. When, with this object in view, the coat was shown to the radiographer, no interest was aroused. The report to the mother by the doctor who examined the radiograph was that the child had not swallowed the button, but he gave instructions that if the child had any vomiting, diarrhoea, or signs of pain he should be taken back immediately. I received no report and decided on a "wait-and-see" attitude. Late on the night of Dec. 8 I was called to see the child, who had waked up crying and vomiting some hours after being put to bed. On examination no abnormal signs were found, and next morning the child was quite fit again. I heard no more of him until Dec. 31, when the mother told me that during the morning when she removed the child's soiled napkin she found the missing button in his stool, the holes in the button being well filled with faeces. It is interesting to note that the button took 32 days to traverse the intestinal tract, that apart from the occasion mentioned there were no abnormal signs, and that owing to the composition of the button the x-ray examination and report were valueless.

#### Dermatitis after Local Sulphonamides

Dr. J. SEGOBIN writes from the island of Rodriguez: The memorandum on dermatitis after local sulphanilamide treatment (April 3, 1943, p. 144) by Flight Lieut. Ian MacGregor is interesting. May I add my observation to it. A girl of 16 sustained a fall and her foot was bruised in the inner part of her left ankle by the kerb of a cemented footpath. After a few days the bruised tissue sloughed off, leaving a tropical ulcer of about 1½ in. diameter. In spite of various local treatments for six months there was no improvement, and I then decided to apply powdered sulphapyridine. The wound did well, but after two weeks' application of 1 tablet of 1/2 g. daily, the region below got irritated and took the form of a large weeping eczema, which was easily amenable to lotio plumbi and lin. calaminae. Fortunately the incident happened at the terminal stage of the ulcer, and the suspension of sulphapyridine did not affect its healing.

#### Herpes and Varicella

Dr. TH. JAMES writes from Induna, Southern Rhodesia: To comment on Dr. R. J. Gourlay's letter (Dec. 4, 1943, p. 736) about his case of chicken-pox following contact with shingles, surely it can be said to be quite an established fact that these two conditions are closely but yet inexplicably associated, and in circumscribed communities like those on air stations and in camps it is always a wise measure when a case of shingles occurs to look among the contacts for cases of early chicken-pox. If the cumulative evidence of numbers is required I can add two more. One of these cases showed the association very clearly. An airman developed some vesicles on his left chest and did not report sick but had a friend who applied a dressing of sorts, daily for several days, after which time, however, he did report sick with a typical shingles eruption. His friend who had done the dressings reported sick with chicken-pox about ten days later.

#### Non-Combatant Officers

Wing-Comdr. H. M. STANLEY TURNER writes: The current number of the *Journal of the Royal United Services Institution* contains an article on "The Dress of the British Army," by Major R. J. H. de Brett of the West Yorks Regiment, containing some interesting observations on the status of non-combatant officers—a class to which medical officers of all three Services belong. He says: "At present in the British Army, if an officer is to be given status in order that he may give orders and command respect, he has to be given the King's Commission, though he may not possess the technical qualifications which every holder of that Commission should possess." He continued: "A distinction between combatant and non-combatant officers is long overdue. Non-combatant officers should be given similar status to war correspondents and wear a uniform which clearly shows that they do not hold the King's Commission." Obviously if an individual does not hold the King's Commission he is not an officer, either combatant or non-combatant. What exactly the "technical qualifications" are which every holder of a Commission should possess the author unfortunately does not specify; nor does he enlighten us as to why medical officers should be given the status of war correspondents, even though they may be given the King's Commission to "command respect" if they have to "give orders," for they certainly fall within his definition of non-combatants.

#### Disclaimer

Squad. Ldr. G. WILLOUGHBY CASHELL, R.A.F., writes: The publicity in the lay press given to a recent communication of mine in the *British Medical Journal* was without my knowledge or consent.

#### Correction

In the *Journal* of April 15 (p. 546) under the heading "*Trichomonas vaginalis*," the first word of the second paragraph of the answer to the question should read "Liston," and not "Lison." The reference is *Brit. J. vener. Dis.*, 1940, 16, 34.

# BRITISH MEDICAL JOURNAL

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## THE CONTROL OF DUST-BORNE STREPTOCOCCAL INFECTION IN MEASLES WARDS

BY

JOYCE WRIGHT, D.M. ROBERT CRUICKSHANK, M.D., M.R.C.P., D.P.H.

AND

WILLIAM GUNN, M.B., Ch.B., F.R.C.P., D.P.H.

(From the L.C.C. North-Western Hospital and Group Laboratory, Hampstead)

Hospital trials on the control of dust-borne infection by oiling blankets, ward linen, garments, and floors were carried out in scarlet fever and measles wards in this hospital during the spring of 1942 and of 1943. The work in a scarlet fever ward, while on the whole encouraging, awaits the result of further tests before being recorded. The results of a controlled test in two measles wards are now reported.

The haemolytic streptococcus has for many years been recognized as a predominant secondary invader in measles and as an important cause of its serious complications—e.g., otitis media, mastoiditis, and bronchopneumonia. The virus-damaged mucous membrane of the respiratory tract, the catarrhal nature of the primary infection, and the overcrowding of patients in hospital at epidemic times all combine to favour the acquisition and spread of streptococci. The incidence of otitis media among measles patients may be as high as 20% (Allison and Brown, 1936); and of the patients so affected as many as 30% may develop mastoiditis. The frequency and severity of its complications made measles an important infection among the camp diseases of the United States Army during 1917 and 1918 (Michie and Lull, 1928). Its most serious consequences were pneumonia, empyema, and otitis media, which in the majority of cases were due to haemolytic streptococci. Cole and MacCallum (1918) found that a haemolytic streptococcal throat-carrier rate of 11.4% among measles patients on admission to hospital had risen to 38.6% after 3 to 5 days in the wards and to 56.8% after 8 to 16 days. They concluded that the chance of developing post-measles streptococcal infection was increased by residence in hospital, and that the high incidence of pneumonia, and the resulting high mortality, were due in part to infection occurring within the hospital. The sequence of events has become clearer since Griffith (1934) extended his method for the serological typing of *Str. pyogenes*. Allison and Brown (1936) were thus enabled to make a survey in a measles ward. They took nose and throat swabs from 43 patients once weekly from admission to discharge, and appropriate swabs on the occurrence of any complication. By typing the strains of *Str. pyogenes* which they had isolated they showed that cross-infection with these organisms occurred in 22—i.e., 51.2%—of the 43 patients; and that of the patients thus cross-infected 13 developed complications as a result (7 otitis media; 1 scarlet fever with otitis media; 1 rhinitis; 4 rise of temperature only). In other words, 19% of the measles patients developed otitis media consequent upon cross-infection with streptococci.

The work of Brown and Allison (1937) and of Cruickshank and Godber (1939) suggested that dust may be an important vehicle of haemolytic streptococci among patients with upper respiratory tract infections. These investigations revealed an

increase in the number of streptococci in the ward air during bed-making and sweeping activities. Later, Thomas and van den Ende (1941) observed that in a ward containing tonsillitis cases both floor-sweepings and bed-clothes were heavily contaminated with haemolytic streptococci. Van den Ende, Thomas, and colleagues (van den Ende, Lush, and Edward, 1940; Thomas, 1941; Thomas and van den Ende, 1941; van den Ende, Edward, and Lush, 1941; van den Ende and Spooner, 1941; van den Ende and Thomas, 1941) investigated possible measures for the control of dust-borne infection in wards. The dust-laying effect of spindle oil when applied to floors was tested in field trials by Thomas, who found that the method produced a prolonged and marked reduction in the number of bacteria in the air during sweeping. Since, however, the main source of the bacteria-carrying particles lay in the bed-clothes, van den Ende and co-workers devised methods for the treatment of woollen and cotton materials with technical white oil, which reduced by 99% the number of micro-organisms liberated during bed-making. The method of oiling ward articles by the use of oil-in-water emulsions (van den Ende and Thomas, 1941) during the laundering process has been modified and made more practicable for large-scale application by Harwood, Powney, and Edwards (1944) of the British Launderers' Research Association. These workers describe their technique in an article at page 615 of this issue.

### Scope of the Investigation

The purpose of this work was to find out if, in a measles ward, the oil treatment of floors, bed-clothes, linen, etc., would reduce: (1) the number of haemolytic streptococci in the air during sweeping and bed-making, (2) the incidence of cross-infection by haemolytic streptococci, (3) the incidence of clinical complications due to such cross-infection.

The work was undertaken for 12 consecutive weeks during March, April, and May, 1943, in two measles wards, identical in size, design, and aspect. In one—the Control Ward—no measures were taken against dust-borne infection. In the other—the Test Ward—the following measures were taken: during the first three weeks the floor was treated with spindle oil; during the subsequent nine weeks the floor was re-oiled every four weeks, and all blankets, counterpanes, sheets, pillow-slips, patients' garments, towels, gowns, white coats, curtains, etc., were treated with technical white oil during laundering. The blankets of each patient were disinfected after his discharge or transfer from the ward, and were washed and re-oiled every four weeks. The articles were oiled at the Laboratories of the British Launderers' Research Association. The bacterial content of the air, and the cross-infection and complication rate due to haemolytic streptococci, were studied in both wards throughout the investigation.

### Ward Arrangements

1. The normal bed complement was 18 for each ward, and the normal spacing was 12 feet between bed-centres. During ten weeks of the investigation two extra beds, and during two weeks four extra beds, were put up in each ward, and the bed-spacing was correspondingly reduced.

2. So far as was practicable, patients were admitted alternately to the two wards.

3. Sulphonamides were given prophylactically to all patients unless there was any contraindication. During the first three weeks of the work a number of different drugs were used, in varying doses and for varying times. An intensive scheme was then introduced, and alternate patients admitted to each ward received sulphanilamide or sulphathiazole. The dosage, according to age, was 1 to 2 g. on admission, 3 to 7.5 g. daily for 3 days, followed by 1.25 to 3.75 g. daily till the day before discharge.

4. On admission prophylactic mixed scarlet fever and diphtheria antitoxin was injected into 54 (70.1%) of the 77 patients in the *Control Ward*, and into 56 (55.4%) of the 101 patients in the *Test Ward*.

5. Toys from both wards were periodically disinfected by heat. (During the later part of the work each patient in the *Test Ward* was allotted one toy, which was disinfected when he left. Had this plan of toy control been noticed earlier a similar method would have been adopted in the *Control Ward* also.)

6. Mattress, pillows, and blankets of each patient were disinfected in the hospital steam disinfector (5-lb. pressure for 30 minutes) on his discharge or transfer from the wards.

7. Patients with suppurative otitis media, if retained in the wards, were barrier-nursed. Feeding and sanitary utensils used by these patients were disinfected after use.

### Routine Procedure

**Air Sampling.**—The bacterial content of the ward air was investigated by means of a slit sampler (Bourdillon, Lidwell, and Thomas, 1941). At intervals of 7 to 14 days air samples were taken in each ward during the early morning bed-making and sweeping times. The machine, on a trolley, was moved from one bed to the next as each in turn was made. During sweeping the machine remained at a central position in the ward. The height of the slit, through which air was drawn at the rate of one cubic foot a minute, was four feet from the floor. For measuring the total bacterial content of the ward air blood-agar plates were exposed in the slit sampler for one to three minutes, and were incubated aerobically for 24 hours at 37° C. The number of bacterial colonies (and, if not overgrown, the number of haemolytic streptococcus colonies) was counted on each plate. On crowded plates only an approximate count could be made. The total volume of air sampled for total bacteria was 8 cu. ft. on each occasion during bed-making or sweeping. For measuring the haemolytic streptococcus content of the air gentian-violet blood-agar plates were exposed in the slit sampler for 5 to 15 minutes. The number of haemolytic streptococcus colonies on each plate was counted after 24 hours' incubation at 37° C. aerobically, and representative colonial forms were transferred to blood broth for subsequent serological typing by the slide-agglutination method of Griffith. The total volume of air sampled on each occasion for haemolytic streptococci was 50 cu. ft. during bed-making and 30 cu. ft. during sweeping.

**Cross-infection Incidence.**—At the start of the investigation nose and throat swabs were taken from all patients in both wards. Subsequently, swabs were obtained from the nose and throat and from any suppurative lesion—e.g., ear discharge, impetigo—of every new patient, immediately before admission to the wards and then once weekly. Nose and throat swabs were taken from each member of the ward staff once monthly, and also on the development of any upper respiratory tract infection. Swabs were plated on gentian-violet blood-agar plates and incubated aerobically for 18 hours at 37° C. Representative colonial forms of haemolytic streptococci were tested for their serological type. Cross-infection was judged to have occurred if a patient, free from haemolytic streptococci on admission, acquired these organisms in the nose or throat; or if a patient who carried haemolytic streptococci on admission acquired haemolytic streptococci of different type in the nose or throat. In assessing the cross-infection rate the Type 6 streptococcus was adopted as the "indicator organism," since more than 90% of the cross-infections in both wards were due to this type. For completeness, however, all cross-infections with other serological types are recorded.

**Complication Rate.**—A daily round of all the patients in both wards was made and any complication or rise of temperature noted. Appropriate swabs were taken and plated on blood agar, and/or gentian-violet blood agar, and/or tellurite medium, according to the nature of the complication. Ear and mastoid swabs were investigated for the presence of haemolytic streptococci, pneumococci,

staphylococci, and diphtheria bacilli. Any haemolytic streptococci isolated from patients with complications were tested for serological type.

### Results of Investigation: Preliminary Period

During a preliminary period of three weeks the routine investigations were carried out in both wards. The only difference in dust control between the two wards during this time was that the floor of the *Control Ward* was unoled, while that of the *Test Ward* was oiled.

**Air Sampling.**—Air samples were taken once weekly in each ward during the bed-making round. In the *Control Ward* the samples yielded respectively 103, 265, and 349 haemolytic streptococcus colonies per 50 cu. ft. of air. The high count of 349 on one occasion was largely due to one sample of 10 cu. ft. which yielded 177 colonies. All of 15 colonies tested serologically were Type 6. In the *Test Ward* the samples yielded respectively 149, 117, and 98 haemolytic streptococcus colonies per 50 cu. ft. of air. Thirteen of 14 colonies tested serologically were Type 6.

**Cross-infection Rate.**—At the start of the investigation 8 (36.4%) of the 22 patients in the *Control Ward* had Type streptococci in the nose and/or throat; in addition one had Type 2 and one had Type 27 streptococci. During the preliminary period 16 (53.3%) of the 30 patients at risk (i.e. Type-6-negative either at the start of the period or on admission) acquired Type 6 streptococci in the nose and/or throat. In addition two other patients acquired Type 2 and Group C streptococci respectively. Seven (38.9%) of the 18 patients already in the *Test Ward* had Type 6 streptococci in the nose and/or throat; in addition one patient had Type "Impetigo 19," and one had Type 12 streptococci. During the preliminary period 18 (58.1%) of the 31 patients at risk acquired Type 6 streptococci in the nose and/or throat. In addition two patients acquired "type not determined" and Type 14 streptococci respectively.

**Complication Rate.**—During the preliminary period 7 patients out of 38 at risk in each ward developed middle-ear suppuration due to cross-infection with Type 6 streptococci. The ear-complication rate due to cross-infection was therefore 18.4% in each ward.

These results disclosed that conditions in the two wards were remarkably similar during the preliminary period. In both between 36 and 39% of the patients were harbouring the Type 6 streptococcus at the start of the work; in both the cross-infection rate with this type lay between 53 and 59%; in both the middle-ear complication rate, due to Type 6 streptococcus, was 18.4%; and in both numerous Type 6 streptococci were present in the ward air during bed-making.

### Test Period

During the subsequent nine weeks the same investigations were continued in both wards. In the *Control Ward* no steps were taken during this period against dust-borne infection, whereas in the *Test Ward* the full measures of dust control—i.e., oiled floors, oiled bed-clothes, oiled garments, etc.—were maintained throughout. The change-over to oiled bed-clothes and other articles was accomplished in one day, and the floor was re-oiled on the same day.

**Air Sampling.**—Table I shows the results of air sampling at bed-making times in the two wards during the test period.

TABLE I.—Counts of Total Bacteria and of Haemolytic Streptococci in Air during Bed-making in Control and Test Wards

Ward	Date	Total Bacterial Colonies (approx.) developing per 8 cu. ft. of Air	Haemolytic Streptococci Colonies developing per 50 cu. ft. of Air
Control	3/4/43	14,610	147
	15/4/43	15,540	131
	1/5/43	12,580	97
	13/5/43	5,240	218
	20/5/43	7,580	39
	26/5/43	1,120	7
Test	2/4/43	1,780	10
	9/4/43	1,013	2
	17/4/43	685	2
	30/4/43	1,845	0
	14/5/43	445	0
	22/5/43	390	0



Table II shows the results of air sampling at sweeping times in the two wards during the test period. Forty-eight colonies of haemolytic streptococci isolated from the air in the *Control Ward* were tested serologically; of these, 37 were Type 6. Eight colonies from the air of the *Test Ward* were typed, and all were Type 6. The reduction in the bacterial counts of the

TABLE II.—Counts of Total Bacteria and of Haemolytic Streptococci During Sweeping in Control and Test Wards

Ward	Date	Total Bacterial Colonies (approx.) developing per 30 cu. ft. of Air	Haemolytic Streptococcal Colonies developing per 30 cu. ft. of Air
Control	3/4/43	4,093	37
	13/4/43	15,260	34
	15/5/43	2,100	52
	13/5/43	1,500	9
	20/5/43	846	10
Test	2/4/43	226	1
	17/4/43	250	0
	30/4/43	810	0
	17/5/43	355	0
	22/5/43	315	0

air in the *Control Ward* towards the end of the experiment may have been due to two factors: (a) the improved weather and longer days, which allowed better natural ventilation; and (b) the reduction in the number of patients in the *Control Ward*, which during the last two weeks had a varying daily complement of 7 to 13, compared with 12 to 17 in the *Test Ward*.

**Cross-infection Rate.**—During the test period 30 (73.3%) of the 41 patients at risk in the *Control Ward* acquired Type 6 streptococci in the nose and/or throat. The infections were distributed regularly throughout the period. Cross-infection with other streptococcal types did not occur. During the test period 11 (18.6%) of the 59 patients at risk in the *Test Ward* acquired Type 6 streptococci in the nose and/or throat. In addition three other patients acquired Group A "type not determined," Group C, and Type "B 3264" streptococci respectively. The ward was never free from a source of the Type 6 streptococcus, the number of patients harbouring this organism at any one time varying from a maximum of nine to a minimum of one. The time during which there was only one source present was eight days. The Type 6 cross-infections were distributed as follows: 2 in the last week of March, 2 in April, and 6 in May.

**Complication Rate.**—During the test period 7 (14.3%) of the 49 patients at risk in the *Control Ward* developed middle-ear suppuration due to Type 6 streptococcus. During the same period 2 (2.8%) of the 72 patients at risk in the *Test Ward* developed middle-ear suppuration due to Type 6 streptococcus. The other cross-infecting strains caused no complications.

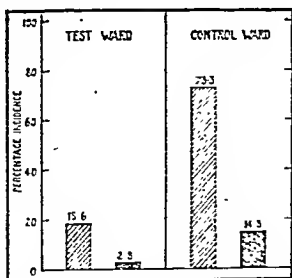


Chart showing cross-infection rate (cross-hatching) and middle-ear infection rate (black columns) due to Type 6 streptococci in (a) *Test Ward* with oiled bed-clothes, garments, and floor; (b) in *Control Ward* with no anti-dust measures.

#### Sources and Spread of Haemolytic Streptococci

**Patients.**—The Type 6 "indicator" streptococcus was well established at the beginning of the investigation. It was not possible to trace its origin, but its presence in both wards may have been due to the transfer of patients from one ward to the other a few weeks before this investigation began. Haemolytic streptococci of various other types were brought into both wards in the noses and throats of newly admitted patients. The carrier rate among new patients to the *Control*

*Ward* was 18.2%, and to the *Test Ward* 12.2%. The type distribution, taking the two wards together, was: Group A, "type not determined," 4; Type 27, 4; Type 11, 2; Types 4/24, 6, 12, 13, 22, 28, "Impetigo 19," one each; Groups C and G, one each. One patient was admitted to the *Control Ward* and two patients to the *Test Ward* with streptococcal otorrhoea. Two of these (one with Type 1 and one with Type 6) were removed from the wards after a few days. The third (Type 22) was nursed in the *Test Ward*. There was no evidence that strains of streptococci in the upper respiratory tracts of new patients spread to other patients in the wards during the period of investigation.

Convalescent patients may become cross-infected after they are allowed up. Thus 5 of the 11 cross-infections in the *Test Ward* were first discovered in the swabs taken on the morning of the patients' discharge from hospital. Apparently they acquired the infection during convalescence by "visiting" infected patients in the ward.

**Ward Staff.**—Haemolytic streptococci were isolated from five members of the staff in the *Control Ward* at the routine swabbing. The type distribution was: Group A, "type not determined," 3; Type 6, 2. The two nurses with Type 6 streptococci developed sore throats. Haemolytic streptococci were isolated from four members of the *Test Ward* staff, with the following distribution: Type 6, 2; Types 12 and 25, one each. From time to time fingers of the ward staffs were swabbed, and it was not uncommon to find haemolytic streptococci upon them.

**Ward Articles.** Toys, etc.—Haemolytic streptococci, often in large numbers, were grown from toys, magazines, baths, tablecloths, bibs, spoons, tables, floors, etc., in both wards.

**Nasal Toilet.**—This was performed with cotton-wool rolled at the bedside on to wooden applicators. Petroleum jelly from a common pot was spread on the lips and face with the fingers. Numerous haemolytic streptococci were found in the petroleum jelly, and, as already mentioned, these organisms were also found on the nurses' fingers.

#### Chemoprophylaxis and Sulphonamide Resistance

Streptococcal cross-infections and their resulting complications occurred in spite of the fact that prophylactic sulphonamides were given to the majority of the patients in both wards. Of the Type 6 cross-infections, 37 of the 46 (80.4%) in the *Control Ward* and 20 of the 29 (69%) in the *Test Ward* were contracted while the patients concerned were receiving these drugs. A possible explanation of the ineffectiveness of chemoprophylaxis in preventing the spread of Type 6 streptococci lay in the fact that these strains in both wards were, as shown by *in vitro* tests, sulphonamide-resistant.

#### Complications resulting from Cross-infection

All cases of otorrhoea and of mastoiditis which developed after admission in both wards were the result of Type 6

TABLE III.—Nature and Distribution of Type 6 Streptococcus Complications in Control and Test Wards

Ward	Nature of Complication	No. of Cases	
		Preliminary Period	Test Period
Control	S.O.M., unilateral or bilateral	6	4
	R.S.O.M., B. mastoidectomy and gastro-enteritis	—	1
	L.S.O.M. and L. mastoidectomy	—	1
	L. mastoidectomy and extradural abscess of middle fossa	1	—
	B. mastoidectomy	—	1
	Skin sepsis	3	1
	Conjunctivitis	—	—
	Sore throat	—	1
	Purulent rhinitis	1	1
	Rise of temperature only	—	—
Test	S.O.M., unilateral or bilateral	2	2
	R.S.O.M. and R. mastoidectomy	—	—
	R.S.O.M. and orbital cellulitis	1	—
	Ulcerated lip	—	1
	Scarlet fever	—	1
	Rise of temperature only	2	2

R. = Right. L. = Left. B. = Bilateral. S.O.M. = Suppurative otitis media.

streptococcus cross-infection. Table III shows that other complications due to cross-infection by this type also occurred. It lists these together with the middle-ear complications. In

the *Test Ward* five children developed dermatitis or erythema of the skin. The reactions, which were mild and quickly subsided, may have been caused by the oil-treated undergarments, since evidence of skin irritation was also observed among scarlet fever patients after wearing similarly oiled garments. This problem is being further investigated.

### Discussion

The results demonstrated that most of the serious complications in the measles wards were due to haemolytic streptococcal cross-infection. At the start of the work there was a heavy load of streptococcal infection in both wards. Toys, books, baths, and other ward articles yielded these organisms in abundance; and more than a third of the patients harboured Type 6 streptococci in the upper respiratory tract. We found also in the preliminary period that this type spread to more than half of the new patients, and caused one in every five to develop suppuration of the middle ear.

For a number of reasons we chose to control dust-borne infection rather than that carried by other means. Haemolytic streptococci multiply, almost as if in artificial culture, on the susceptible mucous membranes of measles patients. The catarrhal character of the disease favours gross contamination of bed-clothes and garments, from which on movement infected dust particles are released into the air. The streptococci are then free to infect fresh patients or to reinfect those already affected. They also contaminate the ward dust, and rise into the air again during sweeping and dusting. Air samples showed that during bed-making the air was heavily charged with haemolytic streptococci and, to a less extent, during sweeping. In the busy measles wards there was a constant stir and therefore a steady contamination of the air. Contact and droplet infection could not be disregarded, but they appeared to be occasional risks only, compared with the day-and-night inhalation of infected dust particles.

A further reason for our attempt to control dust-borne infection was the fact that there were means available of reducing and, possibly, of eliminating it. The first method which we tried was the treatment of the *Test Ward* floor with spindle oil, but we quickly discovered that this by itself was not enough. During a three-weeks trial of this method the air during bed-making contained 100 to 150 haemolytic streptococci per 50 cu. ft., the cross-infection rate (58.3%) was rather higher in the *Test* than in the *Control Ward*, and the ear-complication rate of 18.4% was the same in both wards. These findings are not surprising if the paths of dust-borne infection are considered: upper respiratory tract  $\rightarrow$  droplets and discharges  $\rightarrow$  bed-clothes and garments  $\rightarrow$  ward air during bed-making  $\rightarrow$  ward dust  $\rightarrow$  ward air during sweeping. Thus the application of dust-laying oil to floors breaks only the last link in the chain; it does not influence the first and main reservoir of infected dust particles—the bed-clothes and garments of infected patients. Our second method of attack, therefore, was directed at this earlier link in the chain. The marked reduction in the number of aerial streptococci and in cross-infection and complication rates which followed the oiling of all blankets, ward-linen, and garments has been recorded above. It was, of course, possible that a spontaneous waning of the streptococcal cross-infection in the *Test Ward* had coincided with the introduction of the full anti-dust measures, but it seemed unlikely, for a reservoir of the cross-infecting Type 6 streptococcus never failed in the *Test Ward*, and new patients were admitted at the rate of about one a day. Their susceptibility was shown by the fact that a high cross-infection rate with the same streptococcus prevailed in the *Control Ward* among new patients, drawn from the same population during the same period.

Although the cross-infection rate was greatly reduced in the *Test Ward* after the introduction of oiled bed-clothes and garments, the residual incidence of 18.6% was still too high to allow of complacency. For the further prevention of secondary streptococcal infection in a measles ward measures may be required against mediate infection by fingers, toys, petroleum jelly, etc., and against direct droplet spread by staff carriers or between new and convalescent patients. On the other hand, it seems reasonable to assume that a heavy load of streptococcal infection would have been averted had anti-

dust measures been introduced at the opening of the ward so that these precautions might by themselves have sufficed to prevent clinical complications.

Thus our results suggest that cross-infection in measles wards is mainly due to dust-borne streptococci, which can be controlled by the oiling of floors, bed-clothes, and garments, but not by the oiling of floors alone. However, experience of these new methods of dust control is as yet not sufficient to justify any final judgment on their efficacy, and they should not be pressed into routine service until their advantages and limitations are more fully explored. There seems good reason to believe that they would prove useful in controlling secondary bacterial infection among influenza patients who may have to be nursed in large open wards. Anti-dust measures might also be tried in institutions—e.g., residential schools and training establishments—where respiratory infections are apt to spread.

### Summary

An investigation into the control of dust-borne haemolytic streptococci was carried out in two measles wards of identical design in the spring of 1943. In the *Test Ward*, during a three-weeks preliminary period, the floor alone was oiled. During a nine-weeks period bed-clothes, patients' garments, and all woollen and cotton articles in ward use were treated regularly with emulsions of technical white oil, and the floor was re-oiled at intervals. In the *Control Ward* no anti-dust measures were taken. In both wards the air was sampled for total bacteria and for haemolytic streptococci during bed-making and sweeping, and the streptococcal cross-infection and complication rates were determined and analysed. In assessing the cross-infection rate Type 6 streptococcus was adopted as the "indicator organism," since in the wards it accounted for 90% of the cross-infections and for all middle-ear complications occurring after admission.

In the *Test Ward*, while the floor alone was oiled the Type 6 cross-infection rate was 58.1%, compared with a rate of 53.3% in the *Control Ward*. In each ward the middle-ear complication rate due to Type 6 was 18.4%. Haemolytic streptococci were numerous in the air of both wards during bed-making, the predominant type being Type 6. Thus oiling of floors alone was not sufficient to control the spread of dust-borne haemolytic streptococci in measles wards.

In the *Test Ward*, while the full anti-dust measures of oiled bed-clothes, garments, etc., and oiled floor were in force: (a) the mean haemolytic streptococcus count in the air during bed-making was reduced by 97.5%; (b) the mean bacterial count in the air during bed-making was 91% less, and the mean haemolytic streptococcus count 98% less, than in the *Control Ward*; (c) the mean bacterial count in the air during sweeping was 92% less, and the mean haemolytic streptococcus count 99% less, than in the *Control Ward*; (d) the Type 6 cross-infection rate was 18.6%, while in the *Control Ward* it rose to 73.3%; (e) the middle-ear complication rate due to Type 6 was 2.8%, compared with 14.3% in the *Control Ward*. Thus the oiling of all bed-clothes and ward-linen, in addition to the oiling of floors, effectively controlled dust-borne streptococcal infection in measles wards. Cross-infection from direct contact or mediate means was not prevented by anti-dust measures.

A high streptococcal infection rate occurred in spite of intensive sulphonamide prophylaxis. The cross-infecting Type 6 strain was found by *in vitro* tests to be sulphonamide-resistant.

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### REFERENCES

- Allison, V. D., and Brown, W. A. (1936). *Ann. Rep. C.M.O. of Ministry of Health*, Appendix A, London.
- Bourdillon, R. B., Lidwell, O. M., and Thomas, J. C. (1941). *J. Hyg., Camb.*, 41, 197.
- Brown, W. A., and Allison, V. D. (1937). *Ibid.*, 37, 1.
- Cole, R., and MacCallum, W. G. (1918). *J. Amer. med. Ass.*, 70, 1146.
- Crickshank, R., and Godber, G. E. (1939). *Lancet*, 1, 741.
- Griffith, F. (1934). *J. Hyg., Camb.*, 34, 542.
- Harwood, F. C., Powney, J., and Edwards, C. W. (1944). *British Medical Journal*, 1, 615.
- Michie, H. C., and Lull, G. E. (1928). *History Med. Dept. U.S. Army in World War*, Vol. 9, Washington, D.C.
- Thomas, J. C. (1941). *Lancet*, 2, 123.
- van den Ende, M. (1941). *British Medical Journal*, 1, 953.
- van den Ende, M., Lush, D., and Edward, D. G. ff. (1940). *Lancet*, 2, 133.
- Edward, D. G. ff., and Lush, D. (1941). *Ibid.*, 1, 716.
- and Spooner, E. T. C. (1941). *Ibid.*, 1, 751.
- and Thomas, J. C. (1941). *Ibid.*, 2, 755.

## A NEW TECHNIQUE FOR THE APPLICATION OF DUST-LAYING OILS TO HOSPITAL BED-CLOTHES

BY

F. COURTNEY HARWOOD, B.Sc.

J. POWNEY, Ph.D., B.Sc.

AND

C. W. EDWARDS, B.Sc.

(From the British Launderers' Research Association Laboratories,  
Hill View Gardens, Hendon; N.W.4)

The treatment of bed-clothes with dust-laying oils for the purpose of reducing dust-borne infection in hospital wards has recently been investigated in some detail (van den Ende, Edward, and Lush, 1941; van den Ende and Thomas, 1941; Thomas and van den Ende, 1941). It was found that the application of from 3 to 7% of liquid paraffin or of technical white oil to bed-clothes caused a very large reduction of dust-borne bacteria in the air of hospital wards. Two distinct methods of applying the oil to bed-clothes were studied by these authors: (a) impregnation with oil dissolved in a volatile organic solvent; (b) impregnation with concentrated oil-in-water emulsions.

Neither of these processes permits accurate control of quantities, while, from an economic point of view, both methods entail a recovery process for the unused oil, and would present considerable difficulty in large-scale operation in a hospital laundry. Early in 1942 Dr. van den Ende, of the National Institute for Medical Research, invited the co-operation of the British Launderers' Research Association with regard to this difficulty, and an investigation was carried out in these laboratories in which the use of dilute aqueous emulsions for oiling was considered in detail. As a result of this work an efficient and economic process has been evolved and applied on a large scale. It is the purpose of this paper to present the theoretical considerations and practical details of the process.

### Experimental

A process in which aqueous emulsions of oil are used has obvious advantages over a process in which it is necessary to employ an inflammable solvent. Palmer and Blow (1938) have advocated the use of cation-active agents for the deposition of mineral oil on to wool during certain stages of manufacture, but it is not possible to ascertain from their published data whether complete exhaustion of the emulsion was obtained. During a previous investigation carried out in these laboratories on the influence of cation-active emulsifiers such as cetyl pyridinium bromide upon the electric charge of oil drops (Powney and Wood, 1940), it was found that high positive charges could be established on the drops at extremely low concentrations; furthermore, it was found that at these very low concentrations the electric charge on many non-oily surfaces (usually negative) underwent a relatively insignificant change. It was thought, therefore, that this effect might possibly be utilized to obtain the complete discharge of a dilute oil emulsion on to fabrics.

### Oiling of Wool Fabrics

Preliminary small-scale tests on wool showed that it was possible completely and rapidly to exhaust a dilute oil-in-water emulsion stabilized with a certain concentration of cetyl pyridinium bromide. The amount of oil which can be applied to wool fabric in this manner may be adjusted to almost any requirement. It is necessary for an effective discharge that the liquor shall be maintained in a slightly alkaline state—e.g., at pH 8—as under this condition the cation-active agent is rapidly adsorbed by the wool. It should be emphasized that, by this method, only that amount of oil which is actually required on the fabric is added to the machine, the final waste liquor being virtually clear water. For convenience, concentrated 20% oil emulsions were prepared, and were diluted according to the amount of oil required on the fabric.

### Example

100 g. wool fabric.  
1,000 c.cm. soft water at 100° F.  
25 c.cm. positively charged stock oil emulsion stabilized by "fixanol C."

The fabric was squeezed by hand in this liquor for approximately 10 minutes, after which time all the oil had apparently been taken up by the wool, the resulting liquor being quite clear. The fabric was then hydro-extracted and air-dried. If the deposition of oil was complete there would have been 5% of oil (based on the dry weight of the fabric) present on the wool. The oil content of the sample was ascertained by means of extraction with petroleum ether:

Oil on fabric (calculated) .. ..	5%
" " " (found) .. ..	4.8%

Practically all the oil had therefore been deposited on the fabric.

### Oiling of Cotton Fabrics

By using the above method with cotton fabrics some difficulty was experienced in obtaining complete deposition of oil from the positively charged emulsion. This was overcome by using half the requisite amount of oil as a positively charged emulsion, and subsequently adding the remainder of the oil as a negatively charged emulsion.

### Example

100 g. cotton fabric.  
1,000 c.cm. soft water at 100° F.  
17.5 c.cm. positively charged stock oil emulsion stabilized by "fixanol C."

The procedure in this instance was to squeeze the cotton fabric for 2 to 3 minutes in this liquor and then to add 17.5 c.cm. of a negatively charged stock oil emulsion stabilized by "teepol."† On further squeezing up to 10 minutes deposition was again apparently complete. The fabric was hydro-extracted and dried as before. In this instance the oil content of the dry fabric should have been 7% if all the oil had been deposited:

Oil on fabric (calculated) .. ..	7%
" " " (found) .. ..	6.9%

### Large-scale Operation

At this stage the results of the preliminary laboratory experiments appeared to be satisfactory enough to warrant the operation of the process on a large scale. Arrangements were therefore made for a series of tests to be carried out in scarlet fever and measles wards at the L.C.C. North-Western Hospital in order to ascertain how the incidence of cross-infection was affected by the use of oiled bed-clothes and ward hangings. The British Launderers' Research Association undertook to oil all the necessary articles at its Research Station after they had been washed and rinsed at the hospital laundry. During a period of four months some four tons of articles, including sheets, blankets, pillow-cases, counterpanes, bed-jackets, nightgowns, bibs, restrainers, nurses' gowns, black-out curtains, screens, etc., were treated in normal laundry washing machines.

Oiling takes place after the goods have been correctly washed and rinsed, and it is emphasized that level oiling cannot be obtained if fabrics are washed in hard water, whereby deposition of calcium and magnesium soaps occurs. The last rinsing water is adjusted to a predetermined volume by observing the height of the water in the dip gauge on a standard rotary washing machine, typical processes for the oiling of woollen and cotton articles being given below.

Two aqueous emulsions of technical white oil were prepared; the positively charged emulsion employed "fixanol" as the stabilizing agent at an approximate concentration of 2%, while the negatively charged emulsion employed "teepol" as the stabilizing agent at an approximate concentration of 3%. The

\* "Fixanol C" is a cation-active agent of the cetyl pyridinium bromide type manufactured by Imperial Chemical Industries Ltd. The paste contains approximately 50% of active material.

† "Teepol" is an anion-active agent based on the sodium salts of sulphated secondary alcohols of average chain length 13.2 carbon atoms. The product contains approximately 22% of active material, and is manufactured by Technical Products Ltd.

quantity of oil used in each case was equivalent to 20% of the mixture by volume, and it was finely dispersed by employing an emulsifier which operated on the jet principle. These strong emulsions tended to cream on standing, and it was essential to stir thoroughly before removing the requisite quantities for addition to the washing machine. There would appear to be no reason, however, why more concentrated emulsions containing up to 40 to 50% of oil should not be prepared; and the tendency to cream might be considerably minimized by using a more efficient homogenizer.

#### Process A—for Oiling Woollen Goods

1. Size of rotary washing machine, 34 in. by 54 in. Dry weight of load, 70 lb.
2. Adjust the quantity of softened water used in the last rinse so that, when the machine is running with the load in, the gauge glass registers a dip of 10 in.
3. Adjust temperature of water to 100° F.
4. Add stock "fixanol" emulsion (20% oil content)—1½ gallons.
5. Run machine for 10 minutes, interrupting the rotation periodically to minimize any tendency of the goods to shrink.
6. Stop machine and unload.
7. Hydro-extract and dry in the normal manner.

This process will give a level deposition of oil equivalent to 5% of the weight of the goods.

#### Process B—for Oiling Cotton Articles

1. Size of rotary washing machine, 34 in. by 54 in. Dry weight of load, 100 lb.
2. Raise temperature to 100–120° F.
3. Add stock "fixanol" emulsion (20% oil content)—1½ gallons.
4. Run machine for 2 to 3 minutes without interrupting the rotation.
5. Add stock "teepol" emulsion (20% oil content)—1½ gallons.
6. Run machine for a further 7 to 8 minutes without interrupting the rotation.
7. Stop machine and unload.

This process will give a level deposition of oil equivalent to 6% of the weight of the goods.

During the present hospital trial it was found that the majority of the "woollen" articles to be treated were in fact composed of a mixture of wool and cotton; in view of this it was necessary to use Process B for such articles, since it was found that if Process A, for pure woollens, was used there was an uneven distribution of oil between the wool and the cotton components. The use of Process A for articles of pure wool is optional, since they can also be effectively oiled by Process B. It must be stressed here that the successful operation of this type of oiling process depends largely upon its being preceded by an efficient laundry washing and rinsing procedure. This is particularly true if adequate rinsing of the load has not been carried out, or if there is an accumulation of lime soaps on the articles owing to the use of unsoftened water. Apart from these considerations there is no reason why the oiling should not be carried out by the normal laundry staff, and if the machines used are afterwards rinsed out with hot water no difficulty should be encountered with subsequent washes. After hydro-extraction the load can be finished by the normal methods. No appreciable amount of oil is lost during the calender-drying of cotton articles. There is a slight but unimportant decrease of oil content when blankets and other woollen articles are autoclaved at 5-lb. steam pressure. Thus wool test-pieces having an average oil content of 5.2% showed average oil content of 5.07% after treatment in an autoclave at 5-lb. steam pressure for one hour.

#### Accumulation of Oil

Over a period of successive oilings and washings it was found that there was a definite accumulation of oil in the case of woollen articles, which can only be given a low-temperature wash. Mineral oil such as technical white oil is well known to be extremely difficult to remove completely from textile fibres, and it is therefore not surprising that a progressive building up should occur. It is not desirable that the oil content should rise appreciably above about 5 to 7%, and the degree to which this accumulation may occur will depend largely upon the efficiency of the particular washing process. It is therefore not possible to give any general recommendation by which it can be prevented. A fairly steady degree of oiling can probably be maintained if in the initial

oiling treatment an increased amount of emulsion is used and in all subsequent treatments the amount of emulsion is reduced below that given in the process chart. If laboratory facilities are available the most satisfactory method of control is to incorporate a wool and a cotton test-piece in the respective types of load and to remove, after each oiling, a sample for Soxhlet extraction with petroleum ether. In this way any serious accumulation of oil can readily be detected and appropriate adjustments in the amounts of emulsions used can be made.

#### Discussion

During the present investigation it has been found possible, by the use of suitable emulsifiers, to oil hospital bed-clothes, etc., to any required degree by means of very dilute oil-in-water emulsions. The particular advantage of the present process over that previously described by van den Ende and Thomas is that complete exhaustion of the emulsion takes place, and there is therefore no necessity for applying any oil-recovery process to the used liquor. Both positively charged and negatively charged oil emulsions have been employed, either separately or in equivalent amounts. The cation-active emulsifier "fixanol C" and the anion-active emulsifier "teepol" have been used in the present investigation, but there is no reason why other commercial emulsifiers of similar types should not be used. The methods described are applicable on a large scale in any hospital laundry that observes a correct washing technique.

We tender our thanks to the Council of the British Launderers' Research Association for permission to publish this paper.

#### REFERENCES

- Palmer, R. C., and Blow, C. M. (1938). *J. text. Inst.*, 29, 91.  
 Powney, J., and Wood, L. J. (1940). *Trans. Faraday Soc.*, 36, 57, 420.  
 Thomas, J. C., and van den Ende, M. (1941). *British Medical Journal*, 1, 953.  
 van den Ende, M., Edward, D. G. ff., and Lush, D. (1941). *Lancet*, 1, 716.  
 — and Thomas, J. C. (1941). *Ibid.*, 2, 755.

## OILED FLOORS TO CONTROL RESPIRATORY INFECTION

### AN ARMY EXPERIMENT

BY

P. H. R. ANDERSON, M.B., Ch.B., B.Sc.  
*Lieut.-Col., R.A.M.C.*

J. A. BUCHANAN, M.B., Ch.B.  
*Capt., R.A.M.C.*

AND

J. J. MacPARTLAND, M.B., B.Ch.  
*Capt., R.A.M.C.*

The use of spindle oil to lay the dust on floors and so diminish the number of bacteria in the air was described by van den Ende, Lush, and Edward (1940), and by Thomas (1941). The importance of such air-borne organisms in the spread of respiratory and cross-infections has been emphasized by many writers (Cruickshank, 1935, 1941; White, 1936; Allison and Brown, 1937; M.R.C. War Memo. No. 6, 1941). It therefore appeared of some importance to see if oiling of floors could be used to cut down the spread of air-borne infections among soldiers in barracks. An experiment to test this possibility was suggested and arranged by Col. W. W. S. Sharpe, and was carried out between Dec., 1942, and March, 1943. It gave encouraging results, and, as the general conclusions seem to have aroused some interest (*British Medical Journal* leader 1943), it may be of value to give a short account of the details

#### Conditions of the Experiment

The experiment involved the men in two Army units, A and B, each of which was a large training centre occupying one complete barracks. Oiling of floors was carried out in unit A, while in unit B, which served as a control, the floors were untreated. The two barracks were almost identical in structure, and the men in each lived and worked under closely comparable conditions. The medical officers of units A and B were well known to each other and were able to agree on common standards for the diagnosis of respiratory infection. This was taken to include all cases arising *de novo* which fulfilled either one or both of the following criteria: (1) An upper respiratory

catarrh with obvious local signs. (2) A generalized "influenzal infection" accompanied by pyrexia.

The diagnosis of a respiratory infection was therefore based on objective evidence which, so far as possible, left no doubt as to the nature of the condition. The diagnosis was not made unless there was sufficient reason for supposing that symptoms and signs were due to recent infection. On this ground the following were excluded: (1) Men with chronic bronchitis. (2) Men with cough but without nasal discharge or pyrexia. Such coughs were attributable to excessive smoking, wax in the ears, training exposures to D.M. gas, or various minor causes. (3) Men who developed coryza or pharyngitis following vaccination: this group presented the only real difficulty, since a considerable but approximately equal number of men in the two units showed inflamed throats or a mild degree of coryza at the height of the vaccine reaction.

The proximity of the two units made it possible, if real doubt arose, for both medical officers to examine the man before a final diagnosis was made. In general the matter was not in doubt, since the great majority of respiratory infections were straightforward examples of acute coryza, pharyngitis, laryngitis, tracheitis, acute bronchitis, or influenza. Over the period of observation both units were receiving recruits at intervals of about a fortnight, so that during the 17 weeks of the experiment a large number of men came under review who were experiencing communal barrack life for the first time.

#### Oiling of Floors

In unit A the wooden floors of all barrack-rooms, sleeping-huts, offices, and lecture-rooms were treated with spindle oil at regular intervals. The oil was applied in such a way as to leave an imperceptible film on the surface after thorough impregnation of the wood. Oil treatment of the floors of unit A began in Nov., 1942, and four applications were made at about monthly intervals up to the end of March, 1943. The oil was non-inflammable and caused no unpleasant smell. The best results were obtained if the floors were first thoroughly swept with a stiff broom, then dry-scrubbed, and finally swept with a soft broom before the oil was applied. This was done with old sacking, which was dipped in the oil, squeezed to get rid of excess, and then well rubbed into the floor along the grain of the wood; no excess of oil was allowed to collect or remain on the floor. The surface dried in about six hours, and one gallon of oil was enough to treat about 1,000 square feet of floor space. Second and subsequent applications made at intervals of about four weeks occupied less time than the first; care was again taken to ensure that the oil was thoroughly rubbed in and no excess left on the surface. After treatment the floor was not scrubbed, but was easily kept clean by brushing or occasional mopping with a rag moistened in oil. Within the unit the regimental officers and men welcomed the oiling of floors—a point of some importance. The floors were easier to keep clean, scrubbing being unnecessary, and the presence of dirt on the oiled floors was so readily apparent that the men were stimulated to adopt cleanly habits.

The floors of unit B—the control unit—were left untreated, and in both units careful weekly records were kept of all men reporting sick with a respiratory infection during the 17 weeks ending March 27, 1943.

#### Results

The results are shown in the accompanying Table. It is clear that the weekly rate of new cases of respiratory infection per 1,000 men was consistently lower in unit A, where the floors were oiled, than in the control unit B, where no such treatment of floors was adopted. It is also of importance to note that unit A suffered no major epidemic of respiratory infection, while unit B sustained a severe outbreak of almost epidemic proportions between the middle of February and the first week of March.

#### Discussion

It is not claimed that this is in every respect a perfectly controlled experiment, but the basis of comparison between the two units is probably uniform enough to support the validity of the results. At each unit almost identical conditions prevailed as regards buildings, sleeping-space per man, stress of training, contact with sources of infection outside the barracks, and the standard of black-out ventilation. The units were large (strength 1,300 to 1,700) and yielded obvious respiratory infec-

Table showing Weekly Rate of Respiratory Infections per 1,000 Men in Test and Control Units

Week Ending	Respiratory Infections per 1,000 Men	
	Unit A (Floors Oiled)	Unit B (Control; no Oil on Floors)
5/12/42	4	18
12/12/42	3	27
19/12/42	4	20
26/12/42	2	17
2/1/43	4	47
9/1/43	2	47
16/1/43	8	38
23/1/43	12	45
30/1/43	7	32
6/2/43	11	48
13/2/43	8	58
20/2/43	9	56
27/2/43	12	52
6/3/43	8	48
13/3/43	8	44
20/3/43	5	31
27/3/43	9	20
Weekly average	7	38

tions in sufficient numbers to reduce the doubtful cases to an insignificant proportion of the whole. Another factor of importance was that close collaboration between the medical officers of the two units helped to eliminate extraneous factors which might have introduced error.

The success in curtailing the spread of purely respiratory infections by oil treatment of floors assumes all the greater significance since it is possible that such important diseases of the barrack-room as virus influenza and cerebrospinal meningitis may also be lessened in their incidence by the same simple procedure.

#### Summary and Conclusions

Treatment of wooden floors with spindle oil at regular intervals significantly lowered the rate of respiratory infections in a large military unit as compared with the incidence in a similar control unit, living under comparable conditions, where oiling of floors was not practised.

In the unit where floors were oiled the average rate of respiratory infections was 7 per 1,000 men, as against 38 per 1,000 men in the control unit. During the 17 weeks of the experiment, from the week ending Dec. 5, 1942, to that ending March 27, 1943, no major outbreak of respiratory infection appeared in the test unit; in the control unit an outbreak of almost epidemic proportions prevailed between the middle of February and the first week of March.

#### REFERENCES

- Allison, V. D., and Brown, W. A. (1937). *J. Hyg., Camb.*, **37**, 153.  
*British Medical Journal* (1943). **2**, 717 (leading article).  
 Cruickshank, R. (1935). *J. Path. Bact.*, **41**, 367.  
 — (1941). *Lancet*, **1**, 493.  
 M.R.C. War Memo. (1941). No. 6. London.  
 Thomas, J. C. (1941). *Lancet*, **2**, 123.  
 van den Ende, M., Lush, D., and Edward, D. G. H. (1940). *Ibid.*, **2**, 133.  
 White, E. (1936). *Ibid.*, **1**, 941.

## THE DETERMINATION OF BASAL METABOLISM ON OUT-PATIENTS

BY

J. DOUGLAS ROBERTSON, M.D., D.Sc., Ph.D., D.P.H.  
 (From the Courtauld Institute of Biochemistry, Middlesex Hospital)

Measurement of the basal metabolism is not often employed as a routine investigation in this country. One cause may be that most clinics insist that the subjects live in hospital for a few days in order that the test can be carried out at or near the bedside. Such a preliminary preparation is neither popular with the patient nor looked on favourably by the hospital whose beds are already outnumbered by patients requiring urgent medical and surgical treatment. In this paper proof will be given that in fact it is not necessary to use hospital beds for this test and that determinations on ambulatory patients are satisfactory. At the same time certain technical points on the measurement, accuracy, and constancy of the basal metabolism will have attention drawn to them.

The method of determining the metabolism was that of the "closed circuit," the accuracy of which has already been reported (Robertson, 1937). The apparatus used was the Benedict-Roth with recording kymograph. All machines were alcohol-checked



(Barrett and Robertson, 1937), but in addition each is checked once a week by a model whose basal metabolism is in the region of 56 calories an hour.

### Findings

In the tables which follow, an attempt is made to answer some of the controversial problems in metabolism, such as the number of observations necessary to obtain an accurate result, the effect of exercise on the basal metabolism, and the accuracy of determinations on ambulatory patients.

First, 100 patients were studied on two consecutive days, with duplicate readings each of 10 minutes a day; the results are given in Table I. No significant difference was found

TABLE I.—A Study of 100 Consecutive Patients having Two Tests on Two Consecutive Days

	Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m*)	Significance of Difference, P†
Initial reading .. ..	39.0 $\pm$ 0.75	P>0.4
Second reading on 1st day .. ..	38.9 $\pm$ 0.76	
Basal reading on 1st day .. ..	38.3 $\pm$ 0.76	P<0.001
" " " 2nd " .. ..	36.4 $\pm$ 0.67	

\*  $\sigma$ m is the standard error of the mean. † P (Fisher, 1938).

between the two readings taken on the first day ( $t=0.895$ ;  $P>0.4$ ). There was, however, a significant fall in the basal metabolism on the second day compared with the first ( $t=8.3$ ;  $P<0.001$ ). This finding in addition to a smaller standard deviation on the second day favours a study of the patient on at least two days.

Next, in Table II, are a series of 26 subjects studied on two successive days as before; but on the afternoon previous to the first standard reading two practice tests, of the same

TABLE II.—A Study of 26 Subjects having Two Tests on Two Consecutive Days (but Two Practice Tests similar in Duration to the Basal Tests were carried out on a Previous Afternoon)

	Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m)	Significance of Difference, P
First reading on first day under basal conditions	36.7 $\pm$ 0.46	P>0.20
Second reading on 1st day .. ..	36.2 $\pm$ 0.45	
Basal reading on 1st day .. ..	35.8 $\pm$ 0.39	P<0.001
" " " 2nd " .. ..	33.9 $\pm$ 0.37	

duration as the actual tests, were carried out. The element of training was thus introduced before the first observation under basal conditions. Despite this, however, a significant fall in the metabolism took place on the second day ( $t=6.4$ ;  $P<0.001$ ). Once again the two first-day readings were not significantly different ( $t=1.34$ ;  $P>0.20$ ). Thus whereas a dummy reading or practice test is often of value in relieving the anxiety of some patients, it cannot replace the test, under basal conditions, carried out on two separate days.

To determine whether the metabolism continued to fall as the number of observations increased, a series of 14 subjects were studied on six successive days; the results are given in Table III. Again a significant fall on the second day was

TABLE III.—A Study of 14 Subjects having Two Tests on Six Consecutive Days

	Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m)	Significance of Difference, P
Basal test on 1st day .. ..	35.5 $\pm$ 0.96	P<0.001
" " " 2nd " .. ..	33.5 $\pm$ 0.75	
" " " 3rd " .. ..	33.5 $\pm$ 0.80	
" " " 4th " .. ..	33.6 $\pm$ 0.83	
" " " 5th " .. ..	33.5 $\pm$ 0.75	P>0.2
" " " 6th " .. ..	33.1 $\pm$ 0.83	

noticed ( $t=4.07$ ;  $P<0.001$ ). But a comparison of the second day with the sixth day (the days with the maximum disparity, excluding the first-day tests) showed no significant difference ( $t=1.36$ ;  $P>0.2$ ). Thus by the second day a reproducible basal metabolism can be recorded.

The subjects studied above in Table III were normal healthy volunteers (nurses). A similar study was now made on persons suffering from thyrotoxicosis, and these are given in Table IV.

TABLE IV.—A Study of 7 Cases of Thyrotoxicosis having Two Tests on Seven Consecutive Days

	Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m)	Significance of Difference, P
Basal test on 1st day .. ..	63.2 $\pm$ 3.1	P<0.01
" " " 2nd " .. ..	57.1 $\pm$ 2.6	
" " " 3rd " .. ..	55.1 $\pm$ 1.9	
" " " 4th " .. ..	54.9 $\pm$ 2.2	
" " " 5th " .. ..	55.1 $\pm$ 1.9	P>0.1
" " " 6th " .. ..	54.1 $\pm$ 2.2	
" " " 7th " .. ..	55.1 $\pm$ 2.0	

As with normal subjects, a significant fall in metabolism occurred on the second day ( $t=3.51$ ;  $P<0.01$ ). The fall continued to take place daily, reaching its maximum on the sixth day, but a statistical study showed that this further fall is of no significance. If the second- and sixth-day readings are compared (the days with the maximum disparity in their means) no significant difference is found ( $t=1.73$ ;  $P=0.1$ ). Thus cases of thyrotoxicosis by the second day give a satisfactory and reproducible reading of their basal metabolism.

In Table V the effect of exercise on the basal metabolism is shown. The subjects (12 normal, and 5 cases of thyrotoxicosis) were first studied under basal conditions. After this

TABLE V.—A Comparison of the Metabolism under Basal Conditions with the Same Metabolism following Exercise. After the exercise the subjects lay down on a couch and the metabolism was measured without preliminary rest for the next 40 minutes

No.		12 Normal Subjects		5 Cases of Thyrotoxicosis	
		Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m)	Significance of Difference, P	Mean Heat Output (cals./sq.m./hr. $\pm$ $\sigma$ m)	Significance of Difference, P
a.	Under basal conditions	35.3 $\pm$ 0.47	a & b < 0.001	55.0 $\pm$ 1.7	a & b < 0.001
b.	0-10 min. after exer.	40.2 $\pm$ 1.06		64.3 $\pm$ 2.8	
c.	10-20 " " "	36.8 $\pm$ 0.50	a & c < 0.01	57.1 $\pm$ 1.6	a & c = 0.01
d.	20-30 " " "	35.7 $\pm$ 0.47	a & d > 0.3	54.7 $\pm$ 1.5	a & d > 0.6
e.	30-40 " " "	35.2 $\pm$ 0.48	a & e > 0.4	55.1 $\pm$ 1.7	a & e > 0.8

reading was taken, they rose, and descended and ascended the steps of the Courtauld Institute (95 steps; distance down, 55 feet) in approximately 24 minutes. In both normal and thyrotoxic subjects the metabolism again became basal after a rest of only 20 minutes.

Finally, a comparison was made between the metabolism measured under strictly basal conditions and that under ambulatory conditions. Full details of the routine carried out by four subjects after rising and leaving their homes for the 'metabolism department' are given in Table VI. Despite in some cases quite appreciable exercise and the exposure to an outside temperature about freezing-point, half an hour's repose on a couch in a room at a temperature of 20 to 23° C. was adequate to reproduce basal conditions.

### Discussion

Different clinics do not appear to have the same system of assessing a subject's basal metabolism. There is no unanimity about the number of tests, the number of daily observations; and whether to report a mean of all results or the lowest reading. In some clinics it is the usual custom to carry out only a single determination without any preliminary practice, thus excluding the element of training (Boothby, Berkson, Dunn, 1936). Those authors, however, add that the initial reading is accepted "unless at the time of the test and before its calculation it was noted as unsatisfactory for reasons of restlessness, observable nervous tension or an elevated temperature." There are several objections to Boothby *et al.*'s technique. First, so-called nervous tension is not uncommon at the initial test, and particularly in cases of thyrotoxicosis. Secondly, initial readings are commonly higher, and sometimes much higher, than subsequent or true basal determinations. Thus in a series of 223 subjects aged 19-156 (70%) gave initial readings which were significantly higher than those on the second day, 48 (22%) gave results 10% or more higher, 21 (9%) gave results 15% or more higher.

TABLE VI.—A Comparison of the Bedside and Ambulatory Estimations of the Basal Metabolism

Name	Surface Area (sq. m.)	Bedside Tests After a Night's Rest in the Metabolism Room at temp. of 20-23° C. (cal./sq.m./hr.)	Ambulatory Tests taken After 1 hour's Rest on a Couch in the Metabolism Room at temp. of 20-23° C. (cal./sq.m./hr.)	Procedure Carried out Before Arrival at the Metabolism Department
P.C.W.	1.91	34.4; 35.8; 34.2 Mean, 34.8	34.8 34.7 35.2 Mean, 34.8	Outside temp. 0° C. 8° C. 9° C. 7.30: Rose, washed, shaved, dressed 7.55-8.09: Walked uphill 1 mile to station 8.09-8.50: In train reading newspaper and talking with fellow passengers 8.50-9.10: Bus from Victoria Station. Walk of 1 mile to metabolism department
E.R.S.	1.86	35.5; 35.6; 34.8 Mean, 35.3	35.3 34.1 35.1 Mean, 34.8	7.15: Rose, shaved, warm bath, dressed 7.30: Cycle 14 miles, climbing ca. 100 ft. 7.50-8.45: In train, reading and talking. Walk of 1 mile to metabolism department
A.G.C.M.	1.69	34.2; 32.2 Mean, 33.2	34.6 33.0 Mean, 33.8	7.45: Rose, shaved, warm bath, dressed 8.05-8.20: Walked 1 mile to station 8.20-8.45: In train, reading and talking. Walk of 1 mile to metabolism department
F.S.G.	1.76	33.5; 35.0 Mean, 34.3	32.6 33.9 Mean, 33.3	8.00: Rose, bathed, dressed 8.15-8.30: Walked 1 mile to station 8.30-9.05: In train, reading and talking. Walk of 1 mile to metabolism department
Mean of 4 subjects .. Significance of difference ..		34.4 P > 0.6	34.2	

and as many as 11 (5%) gave readings as elevated as 20% higher. In no case was the initial reading at the time of the test considered unsatisfactory. The series was a group of nurses who had volunteered for the test. To judge a subject's basal metabolism on only a single observation is to run the risk of reporting a raised instead of a normal metabolism. Thirdly, if standards are based on initial readings then the metabolic assessment of subjects who have ever had the test before becomes difficult. The experience of a test previously means training which Boothby *et al.* suggested should be excluded. Finally, the controlling influence of iodine on the basal metabolism of thyrotoxicosis as a diagnostic test becomes much less sensitive; for, indeed, it would be very difficult to determine whether a fall in the metabolism in a subsequent test after iodine was due to the element of training or to iodine.

In other clinics several readings are taken on one day, and either the mean or the lowest reading is accepted as the basal metabolism. Other clinics prefer observations carried out on several days, and again the mean or the lowest reading is taken as the basal metabolism. As the technique for assessing a subject's basal metabolism appears to vary in different clinics, one must expect some disparity in their respective results.

The findings in this paper are that by the second day of basal conditions, with few exceptions, a reproducible result can be obtained for the basal metabolism of normal people and cases of thyrotoxicosis that is constant over a period of several days at least. It has been the custom in this department, therefore, to adopt a certain technique in measuring and reporting on the basal metabolism: it is the attendance of the subject on two successive mornings after the customary fast of at least 12 hours. After half an hour's rest on a couch in a room at a temperature of 20 to 23° C. duplicate

determinations, each of 10 minutes' duration, are taken. On the second day the results are commonly lower than on the first; but if this is not so, the subject is asked to attend on another morning. On the day with the lowest reading the duplicates are expected to agree within 5% (or attendance on a further day is requested), and the lower of the two readings is reported as the basal metabolism.

It is suggested that the measurement of the basal metabolism in this country is not commonly carried out because insufficient use is made of ambulatory determinations. There is a reluctance to accept results on ambulatory patients because they are believed to be inaccurate. This is an entirely false conception without any experimental evidence to support it. Proof has here been shown that in fact metabolism determinations on ambulatory subjects are as accurate, uniform, and reliable as those carried out at the actual bedside if half an hour's repose on a couch in a warm room precedes the determination. Benedict and Du Bois, in a personal communication, stated this interesting fact many years ago, and their findings were confirmed at that time. It is interesting to note that cases of thyrotoxicosis as well as normal subjects, in so short a period as 20 minutes' rest on a couch, can reproduce basal conditions even after such exercise as walking down 95 steps and up again in 2½ minutes. From a diagnostic point of view it is unfortunate that cases of thyrotoxicosis respond no differently to exercise than do normal subjects. For if, in thyrotoxic cases, half an hour's repose on a couch was insufficient to reproduce basal conditions, the effect of exercise on the metabolism might constitute a sensitive diagnostic test for mild cases of thyrotoxicosis. Attention has been drawn to these mild cases of thyrotoxicosis with a basal metabolism apparently normal yet actually raised (Robertson, 1934). Iodine in conjunction with the basal metabolism will invariably detect these mild cases. In that paper a proved case of thyrotoxicosis was described in which an initial basal metabolism of minus 8 fell to minus 27 on iodine (i.e., minus 27 was normal for the patient, so minus 8 meant a raised basal metabolism).

It is believed that the value of ambulatory metabolism determinations is still insufficiently appreciated in this country. The blocking of a hospital bed for several days for an examination of this nature adds considerably to its cost, and the patient is unwilling to co-operate because of loss of working hours, personal expense, and the like. The results given above indicate that there is no reason why an out-patient should not attend hospital in the morning for the test (approximate time, 1 hour), then return to his ordinary duties for the rest of the day. A test carried out early enough might result in no loss of working hours.

#### Summary and Conclusions

A reproducible metabolism measurement can be obtained if the subject attends for the test on at least two mornings under basal conditions. By the second day of the test, if the duplicates agree within 5%, then the lower of the readings can be taken as that subject's basal metabolism. If the second-day tests are higher than those taken on the first day, then further attendance is advisable until a constant reading is obtained.

The above technique can be applied with satisfaction to normal subjects and cases of thyrotoxicosis.

After reasonable exercise basal conditions can be reproduced after resting on a couch for approximately 20 minutes. A preliminary repose of half an hour before metabolism reading is taken is adequate for basal purposes.

A satisfactory, accurate, and reproducible metabolic reading can be obtained on "out-patients." These so-called "ambulatory determinations" are not significantly different from those tests carried out at the bedside under strictly basal conditions.

The reproducibility of the method described above for measuring the basal metabolism is within 5%.

It is a pleasure to thank Prof. E. C. Dodds for his criticism of this paper and the Government grants for scientific investigation, through the Royal Society, for the gift of a basal metabolism machine.

#### REFERENCES

- Barratt, J. F., and Robertson, J. D. (1937). *J. Path. Bact.*, 45, 555.  
Boothby, W. M., Berkson, J., and Dunn, H. L. (1936). *Amer. J. Physiol.*, 116, 468.  
Fisher, R. A. (1935). *Statistical Methods for Research Workers*, 7th ed., p. 125. Edinburgh, Oliver and Boyd.  
Robertson, J. D. (1934). *Lancet*, 1934, 2, 1076.  
— (1937). *Ibid.*, 2, 815.

## NUTRITIONAL OEDEMA IN A VEGETARIAN

BY

J. MacDONALD HOLMES, M.D., M.R.C.P.

*Physician to the Staffordshire General Infirmary and Wrexham and East Denbighshire War Memorial Hospital*

Nutritional oedema has long been recognized as an accompaniment of gross disease of the alimentary tract and of conditions which lead to excessive loss of plasma proteins. It is commonly seen in conjunction with chronic dysentery and other conditions giving rise to chronic diarrhoea. It may be accompanied by symptoms of vitamin deficiency, such as peripheral neuritis or pellagra, and an anaemia of microcytic or macrocytic type is often associated with it.

The chief factor in the causation of nutritional oedema is generally considered to be a hypoproteinaemia, with a consequent lowering of the osmotic pressure of the blood and a disturbance of the balance of fluid distribution between the blood and the interstitial tissue spaces. Moore and van Slyke (1930) state that oedema develops when the total serum proteins fall below the critical level of  $5.5 \pm 0.3$  g. per 100 c.cm.; but other factors, such as the intake and excretion of blood electrolytes, the blood volume, and the presence or absence of anaemia, must also influence the occurrence of oedema, so that it does not necessarily appear when the serum protein content falls below the so-called critical level.

In the absence of gross alimentary disease nutritional oedema is rare in this country, and even vegetarians are able to maintain an adequate protein intake, in spite of wartime restrictions in diet. The case to be described, however, illustrates how a vegetarian diet in association with a comparatively minor gastro-intestinal abnormality may cause a hypoproteinaemia of serious degree, giving rise to symptoms similar to the "hunger" or "famine" oedema which occurred endemically in Europe during the last war and which will no doubt occur again during this war.

## Case Report

The patient, a woman aged 61, was first seen in consultation with Dr. B. A. Abbott, of Rugeley, on Aug. 3, 1943. During the previous few weeks Dr. Abbott had treated her for a severe anaemia by ferrous sulphate and small doses of liver extract intramuscularly. Although the anaemia had practically disappeared she had developed ascites and generalized oedema during the preceding ten days. In 1932 a gastro-enterostomy had been performed for pyloric stenosis due to a chronic ulcer, but no gastric symptoms had occurred since and her health had been good until the onset of the anaemia. She stated that she was an almost complete vegetarian, the only animal foods taken being milk and cheese. For the last eight weeks her appetite had been poor and her intake of milk had been low owing to rationing.

On examination she was pale but not grossly anaemic. Her skin was dry and had a slightly atrophic appearance. She had a red glazed tongue, sore at the tip, and her finger-nails showed a well-marked koilonychia. Gross ascites and a generalized oedema of the whole trunk were present, but oedema was only slightly evident in the face. There was some dyspnoea, and signs of free fluid were observed in both sides of her chest. The pulse rate was 100 per minute, but there was no cardiac enlargement or irregularity. B.P. 140/90. The urine was normal, containing no albumin or casts. Her mental state was normal, and she showed no neurological abnormality. There was no diarrhoea, and the stools were normal in appearance.

She was admitted to hospital for further investigation on Aug. 5. A diagnosis of nutritional oedema had been considered, but the possibility of gastric carcinoma with widespread secondary deposits had to be excluded. Investigations produced the following results: Red count: R.B.C., 3,900,000 per c.mm.; Hb, 72%; C.I., 0.92; W.B.C., 10,200 per c.mm.—polymorphs 76%, lymphocytes 21%, monocytes 3%; slight anisocytosis and poikilocytosis of red cells. Total plasma proteins: 3.3 g. %—albumin 1.98%, globulin 1.32%. Serum sodium 313 mg., serum calcium 8.1 mg., and blood pyruvic acid 0.77 mg. per 100 c.cm. Fractional test meal: complete histamine-fast achlorhydria, with emptying time of 1½ hours. Pleural fluid: 46 lymphocytes per c.mm.; protein 240 mg., chlorides 620 mg. per 100 c.cm. An x-ray film of the chest showed large bilateral pleural effusions. Radiological examination of the stomach and intestinal tract revealed no abnormality apart from the gastro-enterostomy. During the first four days in hospital her urinary output was low, averaging about 600 c.cm. a day, without restriction of fluid intake. She continued her vegetarian diet during this time.

On Aug. 10 the patient was given two bottles of reconstituted plasma intravenously. On the 11th it was noticed that her urinary output had risen to 1,800 c.cm. during the 24 hours and her total plasma proteins to 4 g. %—albumin 2.66%, globulin 1.34%. Two more bottles of reconstituted plasma were given on the 12th, and she was persuaded, with some difficulty, to take a high-protein diet containing ample amounts of animal protein. During the next week the high urinary output was maintained and there was a rapid diminution in the ascites, generalized oedema, and pleural effusions. Her further progress was uneventful, and the ascites, oedema, and pleural effusions had disappeared completely in about ten days. Oral and intravenous glucose-tolerance tests were done on Aug. 14 and 15 respectively, and showed no disturbance of sugar metabolism. She has remained well up to the time of writing, having abandoned her vegetarian diet.

## Comment

Hypoproteinaemia has been classified by Davis and Getzoff (1942) into three types: (1) *Prehepatic hypoproteinaemia*, in which there is interference with adequate intake, digestion, or absorption of plasma-protein building materials. In this type the ability of the liver to form plasma protein is not affected. (2) *Hepatic hypoproteinaemia*, in which there is inability of the liver itself to form plasma proteins, in spite of the fact that normal supplies of protein building material are received from the intestines. This type is usually associated with severe hepatic disease. (3) *Post-hepatic hypoproteinaemia*, in which there is an adequate formation of plasma proteins by the liver but an abnormal loss of plasma protein, as in severe burn or prolonged haemorrhage or suppuration.

The case described was of the "prehepatic" type. The patient's vegetarian diet contained a minimal amount of protein and when her appetite was poor her protein intake was further reduced. The complete achlorhydria no doubt interfered with adequate digestion, and so the plasma proteins fell below the level required to maintain the normal osmotic pressure of the blood. The achlorhydria also interfered with her iron intake and produced an iron-deficiency anaemia.

The treatment of severe degrees of nutritional oedema by a high-protein diet alone may be slow, and it seems reasonable to expect a more rapid response from intravenous plasma transfusions. This expectation was well borne out by the immediate increase in the urinary output after the first plasma transfusion and the rapid disappearance of the oedema.

## REFERENCES

- Moore, N. S., and van Slyke, D. D. (1930). *J. clin. Invest.*, 6, 337.  
Davis, H. A., and Getzoff, P. L. (1942). *Arch. Surg.*, Chicago, 44, 1071.

## Medical Memoranda

## The Use of Cyclopropane in the Field

Shortly before the second battle of Alamein I received, through the co-operation of the D.M.S., M.E.F., Major-General Sir Percy Tomlinson, A.M.S., and the Technical Adviser in Anaesthetics, M.E.F., Major R. W. Cope, R.A.M.C., a cylinder of cyclopropane for use in the forward areas. Since then I have had a small but adequate supply, and I have used it at C.C.S. during the Eighth Army's advance almost to the end of the campaign, at a field surgical unit for the Sicilian campaign and also for four months in Italy, from the landing at Salerno onwards. I think it is now possible to make some assessment of the value of cyclopropane for the type of case operated on at casualty clearing stations and field surgical units.

Approximately 1,200 cases were anaesthetized by me during this time. Pentothal alone was the drug used in 80% of the cases; cyclopropane, with or without the addition of nitrous oxide or occasionally ether, in 10%; local anaesthesia in 5% and intravenous morphine in 5%. The cyclopropane was reserved for the penetrating wounds of the abdomen, the thoraco-abdominal wounds, and those few cases which were regarded as very bad risks and had failed to respond to resuscitative measures. It was found to be of great value in all the cases.

## THE PROCEDURE

*Penetrating Wounds of the Abdomen.*—Most cases were already adequately morphinized, and no further premedication was given. They almost all came to the theatre with a slow blood drip going, and induction was usually effected by injecting 0.25 g. to 0.5 g. of pentothal. Intubation was done as

outine in the early cases, but later it was found that many cases could be managed perfectly well without, and it was only one in those that presented special difficulties. The ease of control of the depth of anaesthesia, the quiet respirations, and the good oxygenation were features that were appreciated. No difficulty was experienced in obtaining adequate relaxation. Patients recovered quickly after operation, and their cough reflex was usually present before they left the theatre.

**Thoraco-abdominal Wounds.**—The same procedure was followed in these cases, except that intubation was done as a routine. Controlled respiration was used when necessary.

**The Very Bad Risks.**—Anaesthesia in these cases was effected with nitrous oxide and a high percentage of oxygen. Cyclopropane was added if necessary.

**General.**—The machine used was a Rochester Lundy Heidrink. It has travelled many hundreds of miles over bad roads and tracks, and has been packed and repacked many times without damage. Two hundred and seventy gallons of cyclopropane have been used for 120 operations. The economy in cylinders thus effected is most striking. If semi-closed nitrous oxide, oxygen, and ether had been used in these cases about 120 100-gallon cylinders of nitrous oxide would have been required instead of the three cylinders of cyclopropane of the same size.

#### CONCLUSIONS

Cyclopropane was found to be of great value for penetrating wounds of the abdomen, thoraco-abdominal wounds, and bad risks.

A modern anaesthetic machine will stand up well to the constant moves and rough usage encountered in the field.

The economy in material effected by the use of the carbon dioxide absorption technique is demonstrated.

It must be emphasized that the circumstances which enabled me to be supplied with cyclopropane were unusual and that difficulties of supply would preclude its use on a large scale.

REN Binning, M.R.C.S., L.R.C.P.,

Major, R.A.M.C.; Anaesthetic Specialist  
to a Field Surgical Unit.

### Expectation of Life after Nephrectomy for Urinary Tuberculosis

The following cases which reported to me simultaneously last Christmas may be of use to those who are asked for prognosis in urinary tuberculosis:

#### CASE HISTORIES

**Case 1.**—A lady was sent to me from Singapore 45 years ago with a grave prognosis of urinary tuberculosis. The presence of tubercle was confirmed. On cystoscopy I found the right ureteral orifice dragged away from its angle in the trigone and recognized that I was dealing not with a vesical tuberculosis but with tuberculosis of the right kidney and ureter. I removed the right kidney, which proved typical of the disease, but left the lower part of the thickened right ureter. This lady has reported yearly to me since then. She has married twice, and the son born subsequent to the operation joined the R.A.F. She is now 70, and though feeling the limitations of her age, is happy, free from pain, and moderately active.

**Case 2.**—Twenty-seven years ago I was consulted about an abdominal attack in a male case which I diagnosed as being due to disease of the appendix. The right epididymis was tuberculous and suppurating, and the patient had a small hard deposit of tubercle in the right prostatic lobe. On opening the abdomen I found the appendix normal, but the entire peritoneal surface was subacutely inflamed and the mesenteric glands were very large and obviously inflamed. I closed the abdomen without drainage. As the patient had tubercle bacilli in the urine, and cystitis, I gave a very grave prognosis; but he recovered, healing normally. He went to the South of France, and after a year or so (1920) my friend Prof. Wildbolz of Berne removed his right kidney. Later on he had cystotomy performed in Mentone and an "ulcer at the neck of the bladder scraped." Eventually he returned to London, and Sir J. Thomson-Walker punched out with a cupping forceps the deposit in the right prostatic lobe. This patient reports to me frequently. He is now 70, very active and without urinary symptoms, and able to enjoy life and take part in the social activities of a large provincial town.

Here are two cases of confirmed urinary tuberculosis, both pointing, I suggest, to the renal origin of the disease, and both relieved by removal of the focus in the kidney.

E. HURRY FENWICK, C.B.E., F.R.C.S.,  
Consulting Surgeon, and at one time Professor  
of Urology, at the London Hospital.

## Reviews

### FEEDING BRITAIN

*Achievement in Feeding Britain.* By Gerald Bullett. (2s. 6d.) London: Pilot Press.

This is No. 5 of the "Achievement Books" which the Pilot Press are publishing. The series is under the general editorship of Mr. Noel Carrington. In his short foreword to this book Mr. Carrington says—truly enough—that the health of the nation has not only been maintained but in many instances actively improved during this war, in spite of severe rationing. Here the overworked general practitioner ironically comments: "In many instances, yes; but in many more instances the boot is on the other foot." Mr. Carrington, however, resuming his exordium, says: "So perhaps we should not only thank God with our daily grace before and after meals but occasionally pay a tribute to the almost miraculous work of those responsible for bringing us our rations—the seamen, the farmers, the dockers, the railway men, the shopkeepers; and, behind them all, the staff of the Ministry of Food." The suspicion of the cynical reader grows, in spite of the truth, justice, and good feeling of every sentence that Mr. Carrington writes—taking exception, possibly, to his grammar. But, to resume. Like the other works issued by the Pilot Press this is well printed on good-quality paper, and is illustrated on every page by one or more photographic reproductions, including several in colour, practically the whole of the photographs being supplied by the Ministry of Food—the hero of the book. The illustrations are most varied, though one misses a portrait of the author himself, who, after all, does the real work of this brochure. Still, nearly everything else is illustrated. There is a very nice portrait of a thrush dropping grubs into the wide-open mouths of its tiny nestlings, in their natural surroundings; while other pictures show a meeting of the Scientific Advisory Committee with Sir J. C. Drummond at the Ministry of Food; a land girl leading a bull to fresh quarters; miners and their families working on their allotments outside the pit-head; and a civic restaurant at Kingston with customers seated at the tables and the walls decorated by young artists. We have a photograph of the King studying a chart with Lord Woolton at headquarters, and one showing the contrast of "potatoes in plenty in 1943" with potatoes in scarcity in 1917. Lord Woolton has been called upon to preside over a difficult enterprise in which few men would have succeeded one-tenth as well as he has—thanks largely to his wise choice of scientific and other advisers, and his wisdom in knowing when wholly to follow their advice, when to follow it subject to modifications, and when to reject it altogether. But we must remember that "even Homer nods," even Socrates made mistakes, and the wisest doctor whom Harley Street has ever produced occasionally finds his diagnosis and prognosis disproved in the pathological laboratory and the post-mortem room. And the Minister of Food must not be confused with the Ministry of Food; nor must either be confused with "the Government."

One thing, however, is certain. Whoever is responsible for the choice made no mistake in getting Mr. Gerald Bullett to write this summing-up of the facts put before him. Mr. Bullett is known to a large part of the educated world as a poet of distinction and one of the finest and most tasteful of anthologists, his only serious English rivals being Sir John Squire, the Viceroy of India, "Q." G. K. A. Bell, and the Secretary of the Society of Authors. This gives considerable authority to any work of this kind that he may undertake; and we can be quite sure that, like Lord Woolton himself, he will obtain his facts from the best-reputed and most authoritative sources, and that he will bring both taste and common sense to the summing-up of these "scientific statements." Of course, even after all this care has been taken and this pictorial splendour has been laid before us, many of us, not the most thoughtless or nationally insoucious, will occasionally raise our eyebrows and think twice before swallowing everything holus-bolus. Here, for instance, are a few memories of my reading and observation that give occasion for pause.

J. C. McClelland (*J. Urol.*, 1944, 51, 1944) records the case of a man aged 42 who was given sulphathiazole gr. 30 and sulphapyridine gr. 150 for acute otitis media in 48 hours. He developed anuria and died early on the seventh day. The pathological findings were not marked, nor did they seem to be sufficient to cause anuria and death. The ureters were not blocked with crystals.

Most readers of the *B.M.J.* are familiar with the name of Hindhede, the celebrated doctor who dealt with the Danish food problem in the last great war. In his book, *Protein and Nutrition*, which was published in Danish in 1906 (when he was studying this problem), he refers to the Sikhs. He agreed with most people that taken as a whole the Sikh is one of the finest types of man to be found in Asia; is independent without being insolent, resolute and firm in character, and remarkably free from petty bias and prejudices. "He respects himself, and, as a result, commands the respect of others; he is a soldier by instinct and tradition, regards cowardice as worse than a crime, and, with his splendid physique and well-ordered ways, is one of the finest of Oriental races." Yet he says that the ordinary trained Sikh takes only two meals daily—morning and evening—and has meat only twice a month. (Dr. Hindhede says that the diet corresponds very nearly with that which has been used for years in his—the author's—home "and it has been found to be ample for our needs. Stomach disorders are unknown to us, and we are unacquainted with scurvy except by name.")

Then again some of us will recall a book entitled *The People's Food*, published a year before the present war started, the author being the "Advertising Practitioner" (his own description of himself), Sir William Crawford. His book is a very interesting one, written only in part for the welfare of the community at large if we remember that the community is composed of individuals, but full of sensible and helpful ideas. Here, perhaps, is his main conclusion:

"To handle the food problem of the future a Food Research Institute is necessary—on which all those interested in health, nutrition, food, are represented. It would direct research into such problems as those quoted from the first report of the Advisory Committee on Nutrition. It would carry out economic investigations and surveys regarding food consumption and the food market. It would take the lead in setting new standards of purity and quality in food, as Lord Horder, in his presidential address to the Royal Institute of Public Health, in the previous year, advocates to safeguard public interests. It would handle schemes of educational propaganda to direct food consumption into the most valuable channels, schemes which would form the background to advertising campaigns for specific foodstuffs which producers and manufacturers might themselves launch. It would be at the service of those statesmen, those health and medical officers, those social workers, and those producers referred to in the opening chapters of this book as being so specially in need of a full understanding of the food market."

Such a machine is necessary to carry a new policy into action. The policy itself is plain. Just as last century the advocates of preventive medicine fought the battle for proper sanitation, so this century they will fight the battle for proper nutrition. Just as to-day sound drains and clean water are the *sine qua non* of civilized life, so will a proper diet come to be regarded as the necessity of all classes of the community.

My memories call up ideas and criticisms in book after book in my library. There is *Health and Longevity through Rational Diet*, written by Dr. Arnold Lorand of Carlsbad, the quotation on the title-page being from Brillat-Savarin: "Tell me what thy food is, and I will tell thee what thou art." Another very interesting little book is one with a cardboard cover—*Cookery without Flesh*, printed and published in 1818, in which perhaps the most relevant section is the one on bread and bread-making. In this chapter it is stated that "the most wholesome bread is made by grinding down whole grain, only separating the coarser bran; or what is called meslin bread, consisting of wheat and rye ground together." I and many other people wish the deivers of the present national bread had insisted on only the coarser part of the bran or husk being removed, leaving the living germ immediately under the outer husk intact. That, of course, entirely alters the food adequacy, the tastefulness, and the moisture-retaining quality of the bread—reminding one of the old farmhouse bread. But, of course, it would not suit the miller so well, as the flour does not "keep" so long.

In conclusion, I strongly advise every reader of the *B.M.J.* who has time to read anything else, at all to buy, beg, or borrow Mr. Bullett's first-rate introduction to a really important subject with which all doctors are, or ought to be, concerned.

HARRY ROBERTS.

## CLINICAL PARASITOLOGY

*Clinical Parasitology.* By C. F. Craig, M.D., F.A.C.S., F.A.C.P., and E. C. Faust, M.A., Ph.D. Third edition, thoroughly revised. (Pp. 767; illustrated. 45s.) London: Henry Kimpton. 1944.

The fact that a third edition of this book has been called for in the space of seven years is a sufficient indication of its high value. The present edition has been thoroughly revised and the various sections brought up to date. A perusal of the contents shows that very little has been left out. The new edition contains 40 new figures and four coloured plates illustrating malarial parasites. These greatly enhance the value of the book, which still remains the best one available on the subject of clinical parasitology, meaning by this the morphology and life-history of organisms in the fields of protozoology, helminthology, and entomology which are responsible for producing disease in man, the methods of their identification, the pathological conditions they produce, and the means of treatment and prevention. The book will be chiefly of use to laboratory workers in the field of tropical medicine, whether at home or abroad, and it should be available to all who are called upon to investigate cases of sickness in those who have been exposed to tropical infections.

The book is profusely illustrated, and for this reason it is perhaps a pity that the spirochaetes of relapsing fever in blood are not figured, and that there is no illustration of toxoplasma, which is attracting an increasing attention. The subject of rat-bite fever might with advantage have received some notice. However, these are minor matters that can hardly detract from the excellence of the book, which is of special value at the present time.

## RED CROSS WORK IN CHINA

*The Red Cross at Work in China.* Published on behalf of the United Aid to China Fund (57, New Bond Street, London, W.1.) at 1s. Compiled by F. M. Osborn.

This little book consists chiefly of extracts from letters written by Dr. R. B. McClure, a Canadian medical missionary, born and reared in North China—a graduate in medicine of Toronto University. Soon after Japan attacked China he became first director for the International Red Cross, with supervision of staff and equipment in 14 hospitals throughout North and Central China. After much adventurous service he flew to England in 1938 to inspire interest in China and to raise funds for the organizations helping the wounded and distressed. He found ready and willing help from the British Fund for Relief of Distress in China, the British Red Cross Society, and other organizations now co-operating as the United Aid to China Fund, of which Lady Cripps is president. Before returning to China in 1938 Dr. McClure made a quick trip to Canada and the United States to arouse sympathy there. This little book is well written. It gives a faithful account of all the difficulties that had to be overcome in taking relief to China in her struggle against Japan. It is evident that splendid work has been carried out by the Red Cross, notably by the Friends Ambulance Unit, staffed by British personnel and financed by America—ambulances, a mobile workshop, and two vehicles forming a mobile surgical unit, one containing a miniature theatre and the other an x-ray plant. They were shipped direct to Rangoon and taken to China with great difficulty over the Burma Road. Later in the year the British Foreign Office made a grant of £50,000 for this ambulance relief work. With the help of many photographic illustrations and interesting descriptions in Dr. McClure's letters we are able to visualize the splendid character and courage of the Red Cross work that has been done for China. There was no need of such aid, and ample evidence is shown of the deep appreciation of Chinese wounded soldiers and the many thousands of pitiful refugees. From beginning to end the work is full of human interest. The book is published on behalf of the United Aid to China Fund, and all the surplus after paying for paper and printing, goes to that fund. It is well worth a shilling.



## Notes on Books

Mr. HAMILTON BAILEY'S *Demonstrations of Physical Signs in Clinical Surgery* first appeared in 1927, and has now reached a ninth edition. It is published at Bristol by John Wright and Sons; price 25s. Readers who are familiar with the eighth edition will recall that it was necessary to replace all the illustrations, the blocks and originals of which were destroyed by enemy action. By introducing a number of new pictures and replacing old ones the author and his publishers have tried to improve the work still further. Some parts of the text have been recast; others have been rearranged and correlated more closely with their appropriate pictures.

*Physical Treatment of Anterior Poliomyelitis*, by DIANA B. KIOO, C.S.M.M.G., is published at 6s. by Faber and Faber. A hearty welcome may be extended to this little book, in which the modern principles and methods of treatment of the paralysis of acute poliomyelitis are expounded clearly and with adequate detail. We may hope that it will find its way into the hands of all who have to administer this treatment, and that it will sound the knell of the old and ineffective methods of "rubbing" and "electrical treatment" that for so long have passed muster as treatment in this disabling malady. The only criticism, and this a minor one, that must be made is that the various paragraphs dealing with pathological and clinical aspects of poliomyelitis and other affections of the nervous system, for which the methods described have value, are not always accurate. Disseminated sclerosis is *not* an extrapyramidal system disease, and to speak of "emotional centres" in the brain is to confuse categories. The book would be the better if this aspect of it were submitted to a neurologist for amendment in any future editions.

The second edition of *Gas-and-Air Analgesia*, by R. J. MINNITT (Baillière, Tindall and Cox; 5s.), remains appreciably the same as the previous one. The book is a short but clear exposition of the principles and practice of gas-and-air analgesia in labour, with particular reference to the author's apparatus. It is written primarily for midwives, but it has its lessons, too, for doctors and others who have the comfort and welfare of the parturient woman at heart.

## Preparations and Appliances

A PORTABLE WARMED ETHER-AND-AIR  
ANAESTHETIC APPARATUS

Dr. A. MEREDITH MILLAR writes from Colwyn Bay:

The object in designing this apparatus was to provide a machine which would be easily portable and deliver a warm mixture of ether and air, the concentration of which could be changed rapidly or maintained the same for a period of time, and to ensure that the mixture would arrive at the face warm. It was to be simple so that any anaesthetist could use it. It was hoped it would allow anaesthesia to be maintained at any level.

The apparatus consists of two bottles, each fitted with a drip feed, which is controlled by a needle valve; a quart vacuum flask: a U-tube of 3/4 in. diameter copper tubing, with one end open to the air and the other having a one-way directional valve permitting air to be drawn through the tube but not returned; a short length of rubber tubing (3/4 in. diam.); a face-piece and expiratory valve.

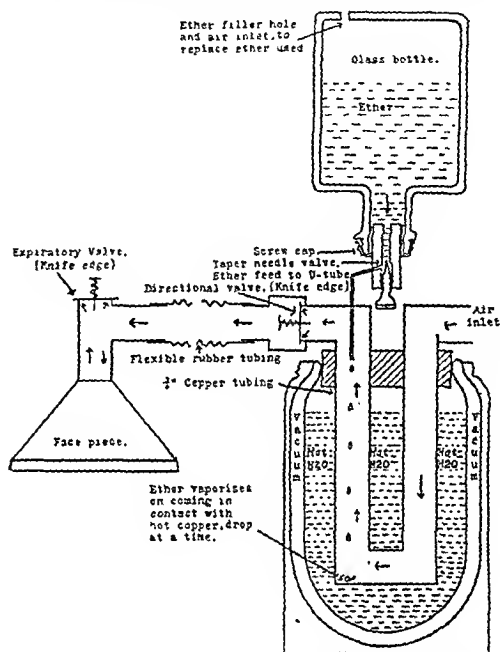
**Action.**—The vacuum flask is filled with hot water, and the U-tube immersed in it. Ether is put in one bottle and vinesthene anaesthetic mixture into the other. Either of these is fed into the U-tube, where it drops into the hot metal and vaporizes, mixing with the air, which has already become warm while in the U-tube. This mixture is drawn in by the patient. As the ether lands on the hot tubing it makes a hiss, which is easily heard, thus indicating the rate of flow. This varies with each case and as the case goes on. To ensure that too great cooling does not take place before the mixture reaches the patient's face, the length of tubing used is not more than 12 in. long.

**Induction.**—Induction is usually smooth and completed in 3 to 5 minutes as a rule. Vinesthene anaesthetic mixture is used to induce as it gives quicker and smoother induction than ether, particularly where premedication has not been adequate. The change over is made by the gradual addition of ether and reduction of V.A.M.

**Maintenance of Anaesthesia.**—When the desired level of anaesthesia has been reached it is easily maintained and alterations in depth are quite simple. If anaesthesia has become too light, it is noticeable that it may be deepened without coughing, as would occur with open ether. In fact a lighter plane of anaesthesia may be maintained. The temperature of the water when starting the anaesthetic was 190–200° F, which gradually

dropped as anaesthesia proceeded. During this time the face-piece, expiratory valve mounting, and rubber tubing all warmed up, so that the mixture was still at about body heat, as it had been at the start. In most cases the water kept warm enough for 1½ hours' use, allowing as many as four operations to be performed without a change of water being necessary. The time it lasted warm depended on the amount of ether required to anaesthetize the patient.

**Economy.**—From this last observation a saving of ether might be expected, and this was borne out in practice. The average for my series of unselected cases was 6.43 oz. an hour. The following are the figures for the first 58 cases that I did: Average age 33½; average induction time 4½ min.; average time of anaesthesia 27½ min.; average amount of ether per case 3.02 oz.; average amount of V.A.M. per case 0.39 oz.; 38½% of the patients vomited. Premedication was usually with morphine, atropine, and seconal.



**Disadvantages and Advantages.**—The slowness of induction as compared with N<sub>2</sub>O or cyclopropane is a drawback. It can partly be overcome with practice and if economy of V.A.M. is not considered. The main advantages of the apparatus are the smooth anaesthesia and good post-operative condition of the patient; its ease of portability and use; the fact that an intratracheal anaesthesia may be given with such a simple apparatus; and its economy. For a head operation the apparatus can be placed so that it is not in the way and the anaesthetist can also be well away from the field of operation, because not only can the drops of ether be heard at the air inlet but the breathing also. The patients have a feeling of well-being which surprises and pleases them, and the hospital staff are also pleased at the reduction in their work.

I should like to thank Mr. D. I. Currie, Mr. H. Lord, and Dr. F. J. Bennett for allowing me to use this apparatus when anaesthetizing their patients.

## SULPHAMEZATHINE SODIUM

Imperial Chemical (Pharmaceuticals) Limited now offer their "sulphamezathine" brand of sulphadimethylpyrimidine in the form of a stable solution of the sodium salt for intramuscular and intravenous administration. It is available in ampoules each containing the equivalent of 1 g. "sulphamezathine" (in 3 c.c.m.) packed in boxes of 6 and 25.

## PROTEOLYSED LIVER

Allen and Hanburys Ltd. announce that supplies of this product are now available for the oral treatment of patients suffering from pernicious anaemia or other megalocytic anaemias. It has a pleasant flavour and can be administered by dissolving in soup or warm water. 1 oz. of proteolysed liver A. and H. is equivalent to 8 oz. of fresh liver. Available in two sizes, 4 oz. and 8 oz.

## BRITISH MEDICAL JOURNAL

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## CROSS-INFECTION BY DUST

Next to chemotherapy the study of cross-infection has been perhaps the most notable feature of medical progress during the war, and it is a study in which this country has led the world. The proof that one patient has infected another often depends on the closest possible identification of the micro-organisms recovered from each of them, and is therefore possible in infections due to common species only when these are divisible into many serological types. Unfortunately from the point of view of specific immunization, but very fortunately for the purposes of epidemiological study, there are two important species of which this is true. Just as the serological typing of the pneumococcus is a product almost entirely of work in the U.S.A., so that of haemolytic streptococci—apart from the broader method of grouping devised by Lancefield—is entirely the work of an Englishman. No survey of this subject is complete without a tribute to the work of the late Frederick Griffith, to which the achievements of others in tracing the migrations of haemolytic streptococci are entirely due. The knowledge so gained of cross-infection, particularly in surgical wards dealing with wounds and burns, and in E.N.T. and fever wards, has posed a problem to which the answers are still being found, though many have yet to be applied. It is an indication of the importance attached to this subject that two of the M.R.C. War Memoranda are devoted to it, No. 6 dealing solely with the problem as it affects surgical wards, and No. 11, published and reviewed in these columns only a few weeks ago,<sup>1</sup> embracing cross-infection of all kinds.

There are two principal ways in which cross-infection can occur: through the air and by contact, either direct or indirect. The second of these routes embraces every kind of failure in aseptic technique, including some which were unsuspected until recently and unprovided for in usually accepted rules. By no means everyone yet appreciates the infectivity of a patient's skin at some distance from his wound, of apparently unsoiled outer dressings or of the outer surface of a soiled plaster, or the capacity of haemolytic streptococci for survival on all manner of objects used by an infected patient. On the other hand, an even more striking fact brought fully to light only in the past three years is the degree and persistence of infection in ward dust. All observers who have studied this quantitatively agree in their findings that dust from wards where

there are patients with haemolytic streptococcal infections may contain hundreds of thousands or even millions of these organisms per gramme. They are also known to survive in this medium for long periods: while a substantial number will certainly survive under favourable conditions for a month; a few survivors in naturally infected dust kept in the dark have been observed by L. P. Garrod<sup>2</sup> after a lapse of over six months. The production of such dust is still something of a mystery even to those best acquainted with it. It consists mainly, as does all domestic dust, of particles of wool or cotton, and many of these are evidently contaminated with infected wound exudate or throat secretion. However produced, it remains an obvious menace, accentuated whenever it is scattered into the atmosphere by bed-making or floor sweeping. One important question which remains unanswered is how much cross-infection in the average ward is due to dust and how much to some form of contact. In other words have we to concentrate on purifying the ward atmosphere or on improvements in aseptic and general nursing technique? This is by no means easy to answer, as may be gathered from a careful study recently made by Edward. This comprised quantitative bacteriological examination of dust at intervals of a week for six months in two wards one for E.N.T. and eye cases and the other a children's ward, together with regular swabbing of throats and any septic lesions in the patients and staff. The numerous haemolytic streptococci recovered were typed, and the types found in the dust were usually those with which one or more patients were known to be infected. On the other hand, there sometimes appeared in dust a fresh type which had not been isolated from any patient, presumably having been introduced from without by a patient attending for a dressing. In spite of this very close method of observation, and of the occurrence of numerous cases of hospital infection, no conclusive evidence was obtained of its transmission by dust.

Perhaps the clearest evidence hitherto forthcoming of the proper apportionment of blame to dust and contagion respectively, at least in one type of ward, is to be found in the paper by Joyce Wright, R. Cruickshank, and W. Gunn in this issue of the *Journal*. There is, as is now well known, one method of dealing with the dust danger which can be applied anywhere, regardless of hospital structure or the absence of up-to-date cleaning facilities: and this is the use of oil to make dust particles sticky, so that they undergo agglutination on the floor instead of remaining easily dispersible in the air. This treatment was applied with the utmost thoroughness, not only to the floor—which alone was almost without effect—but to almost every fabric article in the ward, notably the bedclothes and the patient's garments. An identical ward, also accommodating patients with measles, was not so treated. In the oiled ward total counts of bacteria and haemolytic streptococci in the air during bed-making and sweeping were reduced by about 91 and 98% respectively, both from counts previously obtained in the same ward and those which continued to be obtained in the control. The in-

<sup>1</sup> *Brit. Med. J. (Gen. Pract.)*, 1944, 1, 477.<sup>2</sup> *British Medical Journal*, 1, 245.  
<sup>3</sup> *J. Hyg.*, 1944, 43, 256.

dence of infection by the Type 6 haemolytic streptococcus then prevalent in both wards was only 18.6%, whereas in the control it was 73.3%, and the frequency of otitis media was 2.8%, as against 14.3% in the control. This is clear evidence that under these conditions dust is a major factor in cross-infection, and the demonstrated infectivity of various ward articles can account for only a small fraction of the troubles to which such wards are subject. Valuable as this evidence is, it should perhaps be accepted as applicable only to wards for infections confined to the respiratory tract. Where wounds are concerned, contact may possibly play a greater and dust a lesser part, although it is hard to believe, in view of these very definite findings, that dust can ever be unimportant.

This paper is one of three which deal with different aspects of the same subject. That the oiling of floors alone may be useful in living-rooms as distinct from hospital wards is evident from the interesting experiment made by Lieut.-Col. Anderson and his colleagues in two Army barracks. Floor oiling in one of these was accompanied by a striking diminution in the frequency of respiratory infections, and the significance of the figures obtained seems unquestionable in view of the care evidently taken to provide an exact control, and to observe and record in both units according to the same plan. That those responsible for cleaning liked oiling as a system, apart from its benefit to health, is an encouraging fact. A third paper is by three members of the staff of the British Launderers' Research Association Laboratories, who were invited to study the oiling of fabrics with a view to devising an economical process which would be feasible in any laundry. In this they have well succeeded, since it appears that by adding a small amount of a cationic detergent the oil in an oil-in-water emulsion can be caused to be wholly absorbed by wool. Blankets can thus be impregnated with any desired amount of oil, leaving a fluid from which no surplus oil has to be recovered. Cotton requires somewhat more complex treatment, but on the same principle. If, as seems probable, this process comes to be recognized as an essential safeguard in many hospital wards, these authors' instructions will no doubt be widely followed in the future.

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## THE HEALTH OF MALTA

From the outbreak of war with Italy till the grand release of 1943 the brave people of the Maltese Islands suffered grievous destruction of their property and the increasing privations of a state of siege. During the "prolonged and prodigious" bombardments, when alerts sometimes ran on for forty-eight hours at a stretch, nearly the whole population had to resort to shelter life. Even in the rare periods of comparative quiet they were obliged to live under grossly overcrowded conditions because so many homes had been shattered. The hospitals suffered badly, and emergency services were in constant operation. In addition to anxiety and ever-present danger there was a progressive deterioration of the simple conditions of everyday life. The water supply and the sanitary services were damaged again and again. The preparation of meals was

beset with difficulties, as the essential services of electricity and gas were frequently cut off. As time went on, food rations, as well as allowances of soap, water, and fuel, had to be curtailed. It was hard to maintain bodily cleanliness. The calorie value of the diet dropped to a dangerously low level as the siege became more severe, and fresh protective foods such as eggs, milk, and butter were practically unobtainable. Fresh meat, mainly from goats and horses, was reserved for hospitals, and all milk was strictly rationed to those in urgent need. The people in general subsisted on vegetable soup, some tinned meat or fish, and a little fat, oil, and beans.

The reports of the Chief Government Medical Officer for the years 1941 and 1942 tell a painful but triumphant story of suffering and loss patiently borne until the day of victory. It is not surprising that there was a heavy mortality at the extremes of life, and the health department had to contend with a high incidence of typhoid fever and disturbing outbreaks of dysentery. Unhappily all the conditions favouring the spread of tuberculosis were present, and the disease took full advantage of its opportunities. The mortality from pulmonary tuberculosis rose from 437 per million in 1939 to 843 in 1942, and the non-pulmonary death rate showed a corresponding increase from 133 to 431, giving a total tuberculosis death rate of 1,274 per million persons living. Scarcity of soap favoured the spread of scabies and other clamorous infestations, but these were quickly controlled when services and normal supplies were resumed. The general prevalence of infectious disease was not so great as might have been expected from the wretched conditions of living, but unhappily a sharp outbreak of acute anterior poliomyelitis occurred in the winter of 1942-3, represented by over 400 cases. There have always been sporadic cases on the islands, but this is the first instance of an epidemic. The restriction of food supplies told a plain story. Loss of weight, especially in children, was much in evidence in the later stages of the siege, and there were a few cases of nutritional oedema and rickets. Septic conditions of the skin, ulcerative stomatitis, and other signs of vitamin deficiency were unmistakable, and scurvy appeared among the old. There was a moderate amount of pellagra. These conditions improved rapidly when the siege was raised.

The medical and health department of the Maltese Islands never faltered in the time of trial. The services were carried on in the face of fearful odds, when the added burden of emergency medical services strained the resources to the utmost. The people of Malta have received the George Cross as a worthy token of their courage, but the time is approaching when a more substantial recognition is due. Among the many ruined homes there were slums and unhealthy houses; standards of family life often fell short of the decency and order of a flowering civilization. The great disaster must be turned to greater advantage by building good homes in well-designed towns, "with amenities that would render existence more useful and more pleasant both to the individual and to society as a whole." The Chief Medical Officer rightly adds that it will be a far-reaching tragedy if this unique opportunity is lost.

## BIOLOGICAL VALUES OF MIXED PROTEINS

It has been realized for at least twenty years that a mixture of proteins may have a higher biological value than that of the separate proteins in the mixture;<sup>1,2</sup> and that a relatively small addition of animal protein may considerably raise the biological value of a predominantly vegetable diet. This supplementation occurs when one protein contains an adequacy of one or more amino-acids in which the other proteins of the diet are deficient. For example, gelatin—a protein which itself has an extremely low biological value, since it is completely devoid of several essential amino-acids—has three times the lysine content of wheat proteins, and hence when mixed with the latter produces a mixture better able to provide the body's amino-acid needs—i.e., is of higher biological value than the wheat protein alone.

Very few reports illustrating the working of this principle in practical European diets have been published, no doubt owing to the considerable technical difficulties in the collection of representative meals and in the determination of biological value. The recent paper of Macrae, Henry, and Kon,<sup>3</sup> on the proteins in food served in R.A.F. messes is of special interest in this respect. At each of four R.A.F. stations the total food available to five men at all meals during one week was collected by taking plates at random from the men as they left the serving table. The food was frozen to  $-20^{\circ}$  for a week and homogenized in the frozen condition. The biological values and true digestibilities were determined by giving each diet (slightly diluted to equalize the protein and fat content) in turn to each member of a group of young growing rats and measuring their growth rates and nitrogen balances. Significant differences were found in the biological values and digestibilities of each protein, though all were high, the extreme figures for biological value being 77.6 and 81.2. The protein values of the diets—that is, the product obtained by multiplying biological value, digestibility, and level in the diet,<sup>4,5</sup>—also showed variations, values of 9.5, 11.1, 11.1, and 12.2 being obtained for the four diets. Only three single foodstuffs are known to have biological values greater than those found for these mixed proteins. One of these foods, eggs, was absent from the R.A.F. diets; the second and third, milk and white fish, each contributed a mere 5% of the total proteins. The animal protein was calculated by Macrae *et al.* to be about 43% of the total protein of each diet. Hence the inclusion of 57% of vegetable protein had raised the biological value of the mixed protein to a figure higher even than that of the majority of the individual animal proteins.

These experiments were carried out in October–December, 1941, but the protein position of both civilians and Services has been improved since National flour became compulsory early in 1942. The experiments of Chick,<sup>6</sup> though contested by Wright,<sup>7</sup> are generally accepted as showing superiority in biological value of the proteins of National over white flour. In the R.A.F. diets studied only one-third of the flour, providing 6 to 10% of the total proteins, was of the National variety. Assuming that these determinations of biological value based on rat experiments are applicable to man, it would seem that with the amino-acid contribution of National flour supplementing the other sources of amino-acids in the diet, there need be no qualms about the protein value of our diet during the fifth year of war.

## A SHORT GUIDE TO V.D.

When general practitioners were asked to undertake the treatment of venereal diseases under the Ministry of Health's scheme it was obvious that they would need some guidance. This was provided in a little pamphlet issued by the Ministry of Health and the Department for Scotland entitled *Venereal Disease: Guide for Practitioners* and drawn up by Col. L. W. Harrison. The name of the author is a sufficient guarantee of the quality of the contents, and it can be said at once that it seems hardly possible that this pamphlet could be improved. In fewer than 20 pages is compressed almost all the average general practitioner would want to know about the job he has been asked to undertake; particularly clear are the sections on the taking of specimens and the interpretation of reports of serum tests. These two matters are of paramount importance when one realizes how essential it is that the diagnosis of syphilis, with all that it entails, should be made only on almost incontrovertible evidence. Diagnosis, treatment, and tests of cure are set out with the utmost clarity, and sections are included on equipment, sterilization, and care of solutions and instruments, and in an appendix appliances and drugs required. If any criticism is to be made it would seem that: (1) Four gonococcal complement-fixation tests in three months after completion of treatment of gonorrhoea are rather excessive; (2) the taking of a specimen of prostatic and vesicular secretion one week after apparent cure is rather early when a case has cleared up in a few days under chemotherapy; and (3) irritating the urethra by instilling Lugol's iodine as a test of cure would not appeal to all venereologists. Further, it might be useful to explain how to dissolve neo-arsphenamine preparations—i.e., by sprinkling the powder lightly on to the distilled water, not by pouring the distilled water on to the drug. This is an excellent publication, with the stamp of quality all over it; those who treat venereal disease should study it carefully. Copies may be obtained through the M.O.H. of the county or county borough.

## MISLEADING NAMES

It is clear from correspondence in this *Journal* that the word "mitis" applied to diphtheria bacilli, and, by extension, to cases of the disease, has some tendency to mislead the general practitioner. The Leeds workers who first used the term could readily separate the cultures got from undoubted clinical cases of diphtheria into three broad groups. "Gravis" was mainly found in severe infection with toxæmia, bull neck, and a high incidence of paralytic and cardiac complication; it gave a characteristic colony on heated blood agar and tellurite plates, and fermented starch and glycogen. "Mitis" grew in a different form on these media, did not ferment starch, and occurred more often in mild attacks of diphtheria. "Intermedius" can be considered an intermediate variety of *C. diphtheriae* nearer the "gravis" end of the scale.

The danger appears to be that a doctor may conclude that an infection with "mitis" can be regarded as a "mild" infection, not demanding such instant administration of antitoxin and other proper measures. Any view of this kind might endanger the patient. McLeod<sup>1</sup> in a recent review analysed some 25,000 cases of diphtheria the bacilli from which had been typed. Though the mortality was lower in the "mitis" group—2.6% among 6,858 cases, while 11,492 "gravis" cases had a death rate of 8.1%—181 patients infected with "mitis" died. It is true that the paralytic and cardiac complications were two to three times more common in the "gravis" group than in the

<sup>1</sup> Mitchell, H. H., *J. Biol. Chem.*, 1924, 53, 873, 905.

<sup>2</sup> — and Carman, G. G., *Ibid.*, 1926, 63, 133.

<sup>3</sup> Pickens, J., 1943, 37, 225.

<sup>4</sup> Mitchell, H. H., *J. Home Econ.*, 1927, 19, 122.

<sup>5</sup> — and Hamilton, T. S., *The Biochemistry of Amino Acids*, New York, 1929.

<sup>6</sup> *Lancet*, 1940, 2, 511.

<sup>7</sup> *British Medical Journal*, 1941, 2, 659.

<sup>1</sup> *Brit. Rev.*, 1942, 7, 1.

"mitis," but laryngeal obstruction occurred three to four times more often in the "mitis" group. We do not know how many of these 181 victims would have been saved by an early diagnosis of diphtheria and the instant injection of 2 or 3 c.cm. of modern "refined" or enzyme-treated antitoxin (which has a very small tendency to cause "serum reaction"), but it is safe to suggest that many would have been saved.

It is a fascinating epidemiological problem that strains behave somewhat differently in different areas—thus "intermedius" has often been the most virulent of the three types in Liverpool and several other areas. "Mitis" in the small collection of 310 American cases caused a death rate of 8.1%. M. Frobisher,<sup>2</sup> writing from Baltimore, finds the strict determination of the types so often in disaccord with their effect on the patient that he speaks of an unfortunate confusion between clinical and bacteriological terminology, and favours the application of Roman numerals to the half-dozen or more serological groups that the laboratory worker is able to make in McLeod's three groups. McLeod,<sup>1</sup> after a survey of the world literature available at the middle of 1942 and discussion of the serological subgroups within his main three groups, considers that the three groups "gravis," "intermedius," and "mitis" comprise all the cultures yet identified—except "a small percentage of strains." Whether further research in different parts of the world increases this small percentage to a larger one or not, the terms introduced by the Leeds workers are probably near enough to the truth to have come to stay. An interesting feature of the whole problem is that, though diphtheria antitoxin in use in the whole world was made almost entirely for many years from the descendants of one culture, Parke 8, generally considered to be an "intermedius" variety, the brilliant success in immediate stoppages of outbreaks of diphtheria by the injection of this antitoxin was virtually unbroken, though widely separated epidemics must have been caused by many different bacillary types. Further, it is virtually true that the nursing staff in diphtheria wards can be kept entirely free from attacks of diphtheria by immunization with prophylactic made from this same Parke 8 intermedius strain, though they must repeatedly be exposed to infection by all types when nursing.

### THE KENNY METHOD CRITICIZED

Under the title "Fact and Fancy in Poliomyelitis" there appeared in the *Journal* of July 31, 1943, a critical review of a book by Pohl and Kenny in which the latter's methods of treatment in acute poliomyelitis, and the hypothesis by which the method was sought to be rationalized, were fully discussed. The "new concept" of the disease proposed that the well-known lesions in the motor nerve cells of the ventral horns of the cord were irrelevant, and that true paralysis from destruction of nerve cells was exceptional and unimportant, but that the residual symptoms were due to shortening and wasting of inflamed muscles which had not been properly treated in the initial stage of the illness. The essential lesion of the disease is, according to this concept, an inflammatory condition of muscles leading to spasm, pain, temporary "mental alienation" of muscles, and incoordination. All this is curable by the Kenny method of hot packs and re-education exercises initiated at the earliest possible moment after diagnosis, and the permanent disabilities with which we are all so familiar are due solely to the neglect to combat the muscular inflammation by the Kenny procedures. In short, we have never treated the malady properly because we did not recognize

its true nature. It was easy to expose the fantastic nature of the new concept, and in a recent article J. A. Key<sup>1</sup> provides the necessary criticism of the method. He states that all the cases of so-called cure obtained by the Kenny method that have come under his observation have been those of patients who were never paralysed but belonged to the abortive or non-paralysed group that bulks so large in every epidemic. In claiming 80% of cures for her method Sister Kenny, he says, has omitted to point out that she includes cases of this category, if indeed she recognizes it. In addition she contrasts this figure of cures with the 12% of cures recorded by McCarroll, whose cases came under observation and were treated only because they were in fact already paralysed. Key deprecates the use of broadcast and of lay press to advertise claims of this order.

In a detailed comparison of orthodox and Sister Kenny's methods of treatment Key states that the latter tend to aggravate the illness and to disturb the patient because they involve the application of hot packs and the use of re-education exercises in the initial febrile stage of the illness; that they are wasteful of man-power and of material; that they are applied to many cases that, being of the abortive variety, do not require it; that they lead to unnecessarily prolonged immobilization of the patient on his back; that they handicap mobilization also by the neglect to use appropriate mechanical walking and other supports; that they omit the proper assessment of muscle weakness; that they tend to prolong pain and spasm and do not prevent the development of stiffness and muscle shortening. Finally, he says, patients are buoyed up by extravagant promises of cure. In no case are the results better than by the use of the methods commonly adopted.

These conclusions will tend to confirm doubts left in the minds of readers of Pohl and Kenny's book already referred to. The new concept was manifestly untenable, and it now appears that the method itself is open to objection, and claims made in respect of it have not shown the dispassionate and careful character we have the right to expect of them. It is particularly unfortunate that the direct appeal to the lay public by Press and radio, indicated by Key, should have been made. The public cannot be judges of pathological hypotheses or of therapeutic methods, and false hopes are raised by extravagant and ill-founded claims made in this way. It is not so many years ago that the scientific assessment of the value of convalescent serum in poliomyelitis was prejudiced by such publicly made claims. These claims effectively prevented the making of the necessary control observations, for public opinion in the countries concerned would not tolerate the withholding of serum, for which high claims had been made, from any proportion of cases. The only valid appeal when a method of treatment is under investigation is to expert judgment, given due time and opportunity of observation. A campaign that ignores this principle and flies to the public emotional appeal over the heads of the only proper tribunal does its cause a disservice and gives nothing to medicine.

The next session of the General Medical Council will open on Tuesday, May 23, at 2 o'clock, when the President, Sir Herbert Lightfoot Eason, will take the chair and deliver an address.

**Correction.**—The lecture on "Teaching and Practice in Preventive Medicine," by Dr. J. M. Mackintosh, noted in last week's issue, will be given on June 23—not June 2—at the London School of Hygiene and Tropical Medicine, and it is not a public lecture.

<sup>2</sup> *Amer. J. publ. Hlth.*, 1943, 33, 1244.

<sup>1</sup> *Surg. Gynec. Obstet.* 1943, 77, 359.



## AERIAL CONVECTION FROM SMALLPOX HOSPITALS

BY

C. KILLICK MILLARD, M.D., D.Sc.

*Ex-M.O.H., Leicester*

Forty years ago the theory of the spread of infection from smallpox hospitals to the surrounding population by means of "aerial convection" was accepted by a majority of epidemiologists and regarded as definitely established. To-day the theory has receded into the background, and many are frankly sceptical as to its validity. Thus Harries and Mitman, in their *Infectious Diseases* (second edition, just published) say, in referring to this question, "There are still some who hold the view," but it is clear that they themselves disbelieve in it. In Jameson and Parkinson's *Synopsis of Hygiene*, published in 1934, the theory is not even mentioned, though they give the Ministry of Health's regulations as to the siting of smallpox hospitals, which are based on the theory. It scarcely seems likely that this omission was an oversight: Parkes and Kenwood's *Public Health* is also against it. C. V. Chapin, formerly Superintendent Officer of Health for Providence, U.S.A., in his *Sources and Modes of Infection*, published in 1910, after discussing the question at some length sums up against the theory; and he gives the impression that this is the general view in America.

The question is by no means of merely academic interest. On the contrary, it is of considerable practical importance. Local authorities throughout the country have to make provision for the isolation of smallpox, even though it be only for odd cases which may never occur; and to comply with the Ministry of Health's regulations such hospitals have to be at least a quarter of a mile from another institution or population of 200, and at least half a mile from a population of 600. To maintain all these institutions, seldom or never used, is not an economic proposition; and to open one in a hurry, at short notice, and provide the requisite staff, is often most inconvenient. If the theory of aerial convection can really be disregarded as of no practical importance, there seems no reason why smallpox cases should not be treated in a separate ward in a general isolation hospital with better supervision and much less inconvenience.

It seems desirable, therefore, that the whole question should be reviewed by going back to the original reports upon which the theory was based; and by the courtesy of the Medical Department of the Ministry of Health I have been given access to the Ministry's Medical Library, where I have been able to refer to these reports and other relevant literature. This article is based upon what I have recently been reading.

### History of the Aerial Convection Theory

It was in the great epidemic of 1871 that the Metropolitan Asylums Board began to isolate smallpox cases in hospital; and until 1886, when cases were removed to the Hospital Ships at Long Reach, on the Thames, to the east of London, the smallpox hospitals were situated inside the Metropolis and surrounded by thickly populated areas. It was in respect of Fulham Hospital, in 1881, that W. H. Power, a medical inspector of the L.G.B., demonstrated the influence of the hospital on the prevalence of smallpox in its neighbourhood. He was able to show, and illustrate by a series of spot-maps, that following the use of this hospital for smallpox a graduated intensity of smallpox incidence occurred among the surrounding houses, the percentage of houses invaded becoming gradually less as the distance from the hospital increased. This "influence" of the hospital could be observed up to at least one mile. He satisfied himself, after careful inquiry, that this influence could not be explained by "hospital operations"—i.e., contact with the hospital staff, visits of tradesmen, movements of ambulances, and visits of patients' friends or relatives. He therefore propounded the theory of "aerial convection," or distal conveyance of infection through the atmosphere. Although this had often been suggested before, Power was the first to put the theory forward officially and attempt to justify it scientifically.

The striking facts obtained with regard to Fulham naturally led to inquiry as to whether other smallpox hospitals in London

had brought about increased prevalence of the disease in their surrounding neighbourhoods; and in the Report of the Medical Officer of the L.G.B. for 1886 there was published a section—"Statistics of Smallpox Relative to the Operation of Smallpox Hospitals in the Metropolis"—which showed unmistakably that during the period 1876-85 the hospitals receiving acute cases had been associated with an excessive prevalence of smallpox in surrounding areas. Similar evidence was forthcoming from smallpox hospitals in the Provinces. Speaking in 1886 at a special debate on this question before the Epidemiological Society, Dr. G. S. (afterwards Sir George) Buchanan said:

"We cannot get away from these facts; they are as definite as any known to epidemiology. They had already been ascertained by a multiplicity of careful and detailed observations, in many hospitals, in different epidemics, in London and the Provinces. Recent epidemics have now enabled the question to be tested afresh."

That smallpox hospitals have had a deleterious influence in disseminating the disease in surrounding areas is now admitted, so there is no need for this aspect of the case to be argued further; but it is noteworthy that with no other disease has a similar influence been established. In this respect smallpox stands alone, which proves that its infectivity is exceptional. It is as to the explanation of the influence exercised by smallpox hospitals that difference of opinion exists.

Those who disputed the theory of aerial convection argued that the increased prevalence around hospitals could be explained by human contact in connexion with the normal operations of the hospital, supplemented by irregularities due to laxity of discipline. Against this line of reasoning there was the fact that only in the rarest instances could any contact, direct or indirect, be discovered, in spite of searching inquiry; the great majority of the cases occurring in the vicinity of hospitals were untraceable except on the theory of aerial convection. This is quite contrary to the usual experience in investigating the aetiology of smallpox cases, for careful inquiry will generally elicit some human contact, direct or indirect. There was also the fact that the increased incidence did not follow the main traffic routes to and from a hospital. Moreover, it was pointed out that when hospital staff go on leave they do not visit in the immediate vicinity of a hospital, but rather make for the shopping centre and places of entertainment; also, that tradesmen are not usually appointed because they happen to reside near to the hospital, and that visitors to patients come from all parts of a town where the patients themselves reside. Lastly, even though laxity of discipline might account for occasional spread in the early days, it is to be expected that it would be tightened up after attention had been publicly drawn to the danger. Yet in the case of the Fulham Hospital the influence reported by Mr. Power in 1881 was found to be again in operation in the epidemic of 1885.

Some epidemiologists still seem to think that there is an inherent improbability in aerial convection, so it may be well to say a word about this. It may be taken for granted that the infection of smallpox, as with all infectious diseases, is particulate, and we know that finely particulate matter—carbon, cement, lava—can be carried by the air for great distances. In some manner the infection of smallpox leaves the patient's body and gets into the air of the sick-room or ward, and a susceptible person inhaling that air will readily contract the disease. Infection, then, can be carried by the air for short distances, and this may happen in the open air as well as in the sick-room. The only real question is, For how long can the infection survive exposure to the outside atmosphere? And here it is important to remember that the infection of smallpox, probably more than that of any other disease, can be carried by fomites. This fact certainly suggests that it is exceptionally resistant to desiccation and that it can survive for considerable periods outside the human body. This may explain why aerial convection has been demonstrated only in the case of smallpox. It would seem, therefore, that there is really no inherent improbability in the theory; it is just a matter of weighing the evidence.

### Smallpox in the Orsett Union

The theory of aerial convection as opposed to contact conveyance by hospital operations received striking support from

the experience of the Orsett Union, in the epidemic of 1901-2, in connexion with the Hospital Ships at Long Reach, where cases of smallpox from the Metropolis were then being treated. These hospital ships were moored in the Thames near the Kentish shore, while the Orsett Union was on the opposite or Essex side. During this epidemic the Orsett Union suffered severely, and the outbreak was the subject of a special report by Dr. G. S. Buchanan. He wrote:

"The most striking feature of the epidemic is the remarkable intensity of its incidence on the small community of Purfleet. . . . Out of 110 dwellings no less than 44 were invaded by smallpox. . . . As regards the influence of the hospital ships upon the prevalence of smallpox in Purfleet, we have to choose between aerial convection or nothing; there is here no question of infection, direct or mediate, through human intercourse or traffic."

Purfleet was the parish in the Orsett Union which was the nearest to the ships on the Essex side of the river, but all communication with the ships was from the Kentish side. Not only did it suffer by far the most heavily, but it was the first to be attacked. The next most heavily attacked was West Thurrock, which also happened to be the next nearest to the ships. No other explanation of these facts could be given, for in this case hospital operations could be ruled out. Dr. J. C. Thresh, M.O.H. for Essex, pointed out that all this had happened before, and that in the two previous epidemics since the ships had been used for smallpox Purfleet had suffered exceptionally. The distance from the ships to Purfleet was under three-quarters of a mile, but Dr. Thresh believed that the influence of the ships could be traced for a much greater distance to other parishes in the Union.

#### The Epidemiological Society Debate

In 1904 a full-dress debate on this question took place before the Epidemiological Society of London, when a paper supporting the theory of aerial convection was read by G. S. Buchanan, and many of the leading epidemiologists of the day took part in the discussion. Dr. C. B. Ker, Medical Superintendent of the Edinburgh City Hospital, who opened against the theory, said that he based his objection on his own negative experience at Edinburgh. There the smallpox hospital adjoined not only the fever hospital but the poor-houses and another institution, and there was a population of some 3,000 within the one-mile radius; yet, although for three months they had had an average of nearly 50 smallpox patients under treatment, there was no evidence of infection having spread from the hospital. He concluded that, while not denying the possibility of aerial convection, for practical purposes it might be disregarded. Dr. (afterwards Sir Arthur) Newsholme considered that the theory was not yet proved, and he waited for further confirmation. He thought that excessive prevalence round a smallpox hospital, when not due to coincidence, could be explained by personal contact; and as regards the Purfleet experience, he suggested that surreptitious visits by members of the hospital ships' staffs to the Essex shore might have taken place. (Dr. Buchanan in his reply said that the only instance of this discovered was the case of one man who had visited his sweetheart.) Analysing those who took part in the debate, we find that 12 were in favour of aerial convection and 7 against. Apparently expert opinion at that time was strongly in favour of the theory, and it is noteworthy that since then there has been no further opportunity of testing the theory, owing to the disappearance of epidemic smallpox from this country. In the presence of positive evidence, such as certainly exists from a number of different hospitals in different epidemics, negative evidence from other hospitals cannot settle the question. Innumerable instances have been recorded of failure to infect by personal contact (as where tramps in the early stages of smallpox have wandered about a town without infecting others), yet no one would suggest that this proves that smallpox is not infectious by personal contact. As regards aerial convection, we know little about the conditions necessary for the survival of the smallpox virus outside the human body, or of the meteorological conditions most favourable to this. It has been suggested that it may be related to the presence or absence of ozone, dampness, fog, etc., in the atmosphere.

To sum up, I feel that the case for aerial convection is very strong—much stronger, indeed, than many present-day

sceptics imagine. I think that if they could spare time to consult the original reports they would admit this. At the same time it might be justifiable to allow certain hospitals to try isolating smallpox in general isolation hospitals and watch the result.

In the meanwhile, the theory of aerial convection does certainly provide a solution (and here I speak from personal experience) for remarkable facts in smallpox aetiology which cannot otherwise be explained.

#### CANCER RESEARCH

Prof. H. R. Dean, chairman of Council of the Imperial Cancer Research Fund, presided over the annual meeting of the Fund, which was held at the Royal College of Surgeons of England on April 19. Viscount Halifax was re-elected president of the Fund and Sir Holburt Wariog treasurer. Mr. L. E. C. Norbury and Dr. C. H. Kellaway replace Mr. Sampson Handley and Prof. Major Greenwood on the Council as representatives respectively of the Royal College of Surgeons and the Royal Society.

In a brief account of the year's work Prof. Dean said that in cancer research progress was always slow, but during the last twenty years the rate of progress had been accelerated, and this was due partly to the fact that the observation of cancer as it occurred in human beings had been supplemented by the production of cancer experimentally in animals, but even so, the results of one experiment might need to be observed over a number of years, and every report of a research body such as their own must necessarily be of an interim character, recording investigations which might yet be long in reaching their conclusion.

#### Prostatic Cancer: Two Advances

What appeared to be the most important contribution of chemotherapy to cancer so far made was the administration of diethylstilboestrol, the synthetic oestrogenic compound originally prepared at the Middlesex Hospital, in the treatment of cancer of the prostate gland. This work had the further interest that it was an example of treating gland cancer with a chemotherapeutic substance having the essential physiological properties of a natural hormone. As soon as this method of treatment was announced, Dr. E. S. Horning, a member of the Fund's scientific staff, undertook to study the prostate gland in mice, and to attempt to induce glandular cancer by injecting a chemical carcinogen into the epithelium of the anterior lobe of the organ. In this he was successful, and six epithelial tumours were obtained out of fifty mice treated. This work had been continued by Dr. L. Dmochowski, a visiting research worker, and the chemically induced prostatic cancers had now been transplanted and were being studied.

#### Other Experimental Work

Two other research workers for the Fund, Dr. R. J. Ludford and Miss Hilda Barlow, had been investigating sarcomas arising in the stroma of transplanted breast cancers derived from inbred strains of mice, and had found that when spontaneous mammary cancers of these mice were propagated, each in mice of the strain in which the tumour arose, malignant transformation of tissue stroma was apt to occur. The sarcomas could be separated from the mammary cancers and propagated independently. An opportunity had thus been afforded for close study of these tumours *in vitro* as well as *in vivo*, and at all stages of their development. It confirmed that in some mammary cancers the malignant cell was able to induce malignancy in a neighbouring connective cell.

Another member of the Fund's scientific staff, Mr. H. G. Crabtree, had continued his search for a substance which would inhibit specific metabolic processes on the induction of cancer in mice. He had previously drawn attention to two substances—namely, the groups of compounds represented by chloroacetone and by bromo-benzene respectively, which, though chemically unrelated, were intimately concerned with cancer metabolism, and to these he had now added a third—namely, maleic acid, used as the more fat-soluble maleic anhydride, which was proving even more effective than bromo-benzene as an inhibitor of carcinogenesis when applied in an appropriate

concentration. All the three classes of substances had the common property of fixing labile sulphhydryl groups by three different types of chemical mechanism, all producing the biological effect of checking the action of chemical carcinogens. The inference was that sulphur, in an unknown way, was concerned in this type of cancer induction.

## Nova et Vetera

### HISTORY OF EPIDEMIOLOGICAL DOCTRINES

An English student of medical history reads in 1944 Dr. Charles Edward Amory Winslow's book, *The Conquest of Epidemic Disease*\* with a pleasure perhaps faintly tinged by envy and regret. He may not care much for the title; epidemic disease has not been conquered and the phrase gives no hint of the content of the work. But he will envy the admirably clear style of the writer and the way the book has been produced.

Dr. Winslow set himself the pleasant if laborious task of writing a history of opinion, choosing the authors whom he regarded as of primary importance and, so far as possible, letting them speak for themselves. This method easily degenerates into either a mere anthology with more or less relevant footnotes or into a catalogue of names. Dr. Winslow has avoided both mistakes, and, certainly so far as writers of the last 200 years are concerned, has fully succeeded. His study of Pettenkofer deserves particular praise. It is not easy to write sympathetically on a champion of a lost cause when one feels that, on the whole, the cause was deservedly lost; but Dr. Winslow has done so. One regrets that another champion of lost causes, who, like Pettenkofer, said many true and some profound things, Charles Creighton, is not commemorated in these pages. A special and rare merit of Dr. Winslow's exposition is its freedom from the vice of neocentricity—viz., the assumption that because a writer of the remote past taught something which resembles what we now believe to be true, *therefore* he must have been an exceptionally good reasoner. He may easily, of course, have been a very bad reasoner who guessed happily.

### Contagion or Infection in Ancient Thought

Much of the first half of the book is devoted to an appraisal of the parts played by the concepts of contagion, or infection, and of atmospheric katastases, or constitutions, in the epidemiology of the Greek, Hellenistic, and mediaeval physicians. As Dr. Winslow remarks, few, probably no modern, physicians have mastered the whole of even Galen's writings; each of us must form a judgment on incomplete data. The reviewer certainly does not claim a wider knowledge than that of Dr. Winslow and his collaborator, Prof. Hendrickson, of the sources; but, having been an interested reader of Galen for many years, may attempt to supplement Dr. Winslow's discussion by epitomizing an argument published more than twenty years ago (*Proc. roy. Soc. Med.*, 1921, 14, Sect. History of Med., p. 3).

Contagion or infection in ancient thought has two origins: from the pre-scientific idea of sympathetic magic and as a scientific corollary of the hypothesis of atmospheric change. The magical idea was wholly rejected by the Greek thinkers, but in many, perhaps a majority, of the passages in Latin poets and historians where the word "contagium" occurs that idea lurks. The notion of an atmospheric origin of disease, of a miasma spreading, is akin to that of transmitted vibrations, and at once suggests the analogy of tuning-forks picking up a pure note and transmitting it. Suppose the forks aligned, then the nearest to the original source of sound will first respond, and there is "infection" from one to another. I do not think that in any of the passages cited by Dr. Winslow, or in others which might be cited, Galen's idea of infection went beyond this. One inconsistency (see Dr. Winslow's book, p. 73, footnote) is explained by Prof. Hendrickson as due to a corrupt reading. There is another (see Greenwood, *op. cit.*, p. 7) which does seem to postulate seeds of pestilence in

Fracastor's sense; but the Greek text of the work has not survived. If this is a just analogy, the Greek scientific theory of contagion is merely of conduction; the tuning-forks originate nothing; so to Galen contagion was of secondary importance, he concentrated on the atmospheric katastases and the human crises. To Fracastor belongs the credit of imagining a fresh liberation of energy in each member of the series. Whether he conceived the process as chemical or biological is not, perhaps, a very important question. Had this hypothesis presented itself to Galen, the whole course of medical history would have been different.

### Influence of Galen

Dr. Winslow remarks that "it is a fundamental error to consider Galen as merely a compiler." One may be permitted to doubt whether a single reader of *any* tract by Galen (after all one of Galen's major works is available in the Loeb series) could have made that mistake. But no doubt Galen, like Malthus, is usually judged by people who have never read him. Dr. Winslow writes:

"It is perhaps significant of the difference between the Greek and the Roman mind that Hippocrates is intrigued by problems of causation while Galen—Roman in environment if Greek by race—is almost exclusively preoccupied by the immediate practical problems of diagnosis and treatment. One is essentially a philosopher, the other an experimenter and clinician."

This judgment would have made Galen—two of whose most famous minor works are developments of the argument that a good physician must be a philosopher—very angry and, so far as epidemiology is concerned, is disputable. The most famous Hippocratic writings on epidemiology described observed facts, but Galen, as Littré said, although his opportunities of observing group-disease were far wider than Hippocrates', has left no detailed account of observations. One might easily support a conclusion the precise opposite of Dr. Winslow's and hold that the intellectual weakness of Galen—typical of the Hellenistic Greeks—was over-confidence in dialectic. Perhaps, however, Dr. Winslow had in mind *De Sanitate tuenda*, which might pass as a good practical work on personal hygiene, if the only human beings worth teaching were Roman plutocrats. Dr. Winslow does not give much space to Galen's Semitic followers. As the voluminous Avicenna is only available (except to those who can read Arabic) in dog Latin, this was inevitable, and we may fairly suppose that had an Arabic scholar found pearls of epidemiological wisdom in this large mass of oysters, they would have been displayed by now. One wonders whether Chaucer's "Doctor of Physik" could have read Avicenna all through!

Coming to modern times, Dr. Winslow's account of Kircher on contagium animatum may be instructive to others beside the reviewer, although it may not convince them that Kircher was quite first-rate. The chapter on the enigma of yellow fever tells us a good deal about Rush and Webster which will be new to English and, possibly, American readers. The remaining chapters cover ground which is familiar, although—as noted with respect to Pettenkofer—Dr. Winslow has judiciously used sources not tapped by most textbook writers.

### Pioneers of Statistical Epidemiology

The reviewer—mindful of the cobbler's belief in leather—regrets that Farr plays but a small part and John Graunt no part at all in Dr. Winslow's drama, because he thinks that Graunt's contribution to epidemiology was immensely greater than Sydenham's. It was the London shopkeeper not the learned physician who really returned to Hippocrates as an epidemiologist, displaying essential facts with the help of a method, an organon, which the father of epidemiology might have envied. At least we can thank a countryman of Dr. Winslow for the only modern reprint of Graunt's book. Perhaps, encouraged by the success this book deserves, Dr. Winslow will tell the story of other forgotten pioneers of statistical epidemiology on both sides of the Atlantic. His book is escapist literature in the best sense of that adjective. It takes us out of ourselves and strengthens belief in intellectual progress through epochs almost as gloomy as that in which our own lot has been cast.

\* London: Oxford University Press. (30s.)

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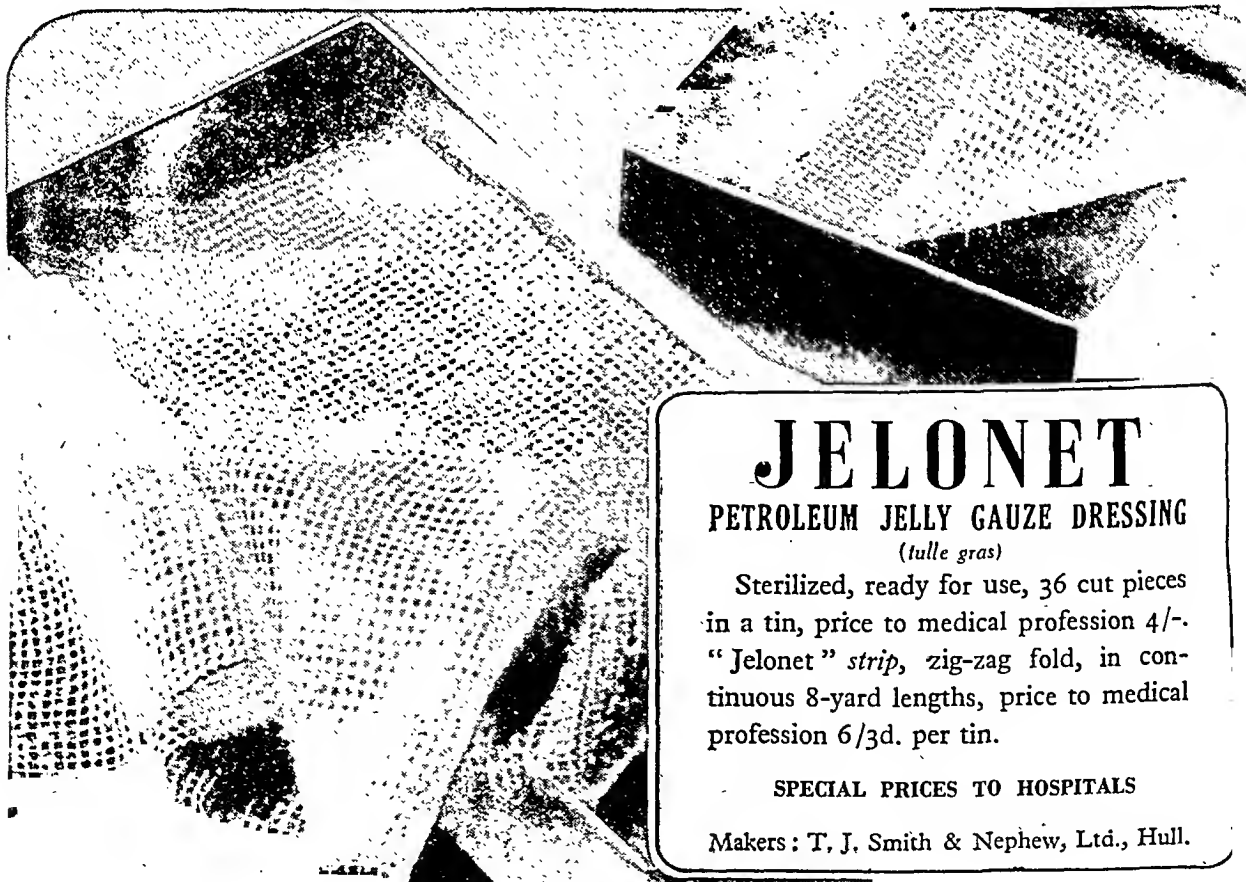
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## HISTORY OF PHARMACY

*Historical Survey of Pharmacy in Great Britain.* By Carl Schmiedler, of C. R. Harker, Starg, and Morgan, Ltd., Devon Wharf, Emmot Street, London, E.1. (Pp. 91.)

Next year will be the 600th anniversary of the opening in London of the first apothecary's shop of which there is historical record, and this little book therefore appears at an appropriate time. The author takes pains to show, quite rightly, that the choice and manufacture of drugs was an art which had developed through many centuries before 1345. Much is known of pharmacy in ancient civilizations, but in this country drug selling is first mentioned in the Pipe Rolls for 1180; in Italy there is evidence that such shops existed in 1140. In these early days the choice of drugs was bound up with astrology and superstition; the alchemical era was the last stage before pharmacy passed to its close partnership with the embryonic true sciences. The book traces the development of the trade through its association with the "Pepperers" and the East, and through its stormy controversies with the physicians after its emancipation as the Apothecaries Company in 1617. Although the *London Pharmacopoeia* was published in 1618, it was not until 1721 that ancient superstition was eliminated from its pages, and the first *British Pharmacopoeia* did not appear until 1858.

The history of pharmacy is a vast subject, and the author has had to choose his line of approach. He deals little with the history of individual drugs, and thus deprives himself of the opportunity of mentioning incidents such as that of the Liocolnshire grazier who in the space of twenty-one years swallowed 40,000 bottles of mixture and 226,934 pills—and finally had to be sued for the bill! There are a few errors: Newton was never an apprentice, but as a schoolboy he lodged with an apothecary named Clark. For the uninitiated a sharper distinction might have been drawn throughout between the apothecary and the druggist. But these are minor matters. The author set out to give a history of pharmacy as a trade in this country, and from this aspect and within his allotted space he has carried out his task sincerely and with considerable success.

## Reports of Societies

## GASTRO-ENTERITIS IN INFANTS

At a meeting of the Fever Group of the Society of Medical Officers of Health on March 31, with Dr. ANDREW TOPPING in the chair, a discussion on infantile gastro-enteritis was opened by Dr. REGINALD LIGHTWOOD.

Gastro-enteritis, he said, was not a disease *sui generis*, but could arise from enteral or parenteral causes. The latter had been stressed in recent years, but it was often difficult to decide whether a parenteral infection caused the enteritis or was secondary to it. Gastro-enteritis was one of the oldest scourges of infants in hospital, and in open-ward conditions high death rates had occurred, particularly so in medical wards, partly because the infection was always being reintroduced and partly because cases arising in the surgical wards were transferred to the medical side. The isolation unit for enteritis cases opened in the Hospital for Sick Children, Great Ormond Street, in 1938 had proved of inestimable value. Although certain facts about the aetiology of zymotic diarrhoea were well established (its virtual disappearance in countries where mothercraft was well taught and practised and its rarity in breast-fed infants) much was still to be learned. Some of the problems were: bacterial cause; the mode of infection in primary cases; the mode of spread; the need for separate cubicles for each case; the necessity for staff to wear masks; and the advisability of nursing parenteral cases near enteral cases. Dr. Lightwood had seen no response to sulphaguanidine, but sulphadiazine and sulphamezathine appeared equally effective for any parenteral infections present. He favoured 5% glucose in half strength Hartmann's solution for intravenous fluid therapy, and recent experience with plasma or serum (diluted with equal parts of the above solution) had given encouraging responses after the initial dehydration had been combated—i.e., after six to

twelve hours. Mastoidectomy had been performed in 9 cases during the last nine months, 5 being fatal, due, he thought, to the debilitated and toxic condition of the child at the time. The operation could be done under local anaesthesia without much apparent disturbance to the general condition of the infant.

Dr. L. J. M. LAURENT said that infantile diarrhoeas were usually classified in three groups: (1) non-infective (mostly dietetic in origin); (2) symptomatic (due to a parenteral infection); (3) infectious, of primary gastro-intestinal origin. But in practice it was often impossible to assign an individual case to its proper group without a week's observation. The mild diarrhoea occasionally seen in the measles or whooping-cough wards at first sight seemed to be of dietetic origin; but the condition often spread in series of cases, and he suspected that the majority were infective. Under "symptomatic diarrhoeas" due to a parenteral infection at all ages should be included the diarrhoeas of puerperal septicaemia, early typhoid, cerebro-spinal fever, toxic scarlet fever, and severe otitis media and broncho-pneumonia in infants. With suitable treatment improvement was usually rapid, though symptoms like dehydration often needed correction. The infectious diarrhoeas of primary gastro-intestinal origin fell naturally into two groups: (a) those of known aetiology—namely, the dysenteries, the enterica, and the salmonellas; (b) those of unknown aetiology, which were a baffling problem. The wide differences in case fatality for gastro-enteritis given by different hospitals (7% up to 53%) could not be explained by age, season, and lines of treatment. He thought at least two diseases were concerned, which he designated Type A and Type B.

In Type A an incubation period, usually of three days, was followed by sudden onset with pyrexia and vomiting, some cases not having diarrhoea for 24 hours. From the start rate of breathing was high and there was a short cough. Many patients were admitted to general hospitals as cases of bronchitis and were later transferred to the fever hospital when the diarrhoea appeared. The stools were watery, bright green or orange in colour, and had a musty, oot faecal, odour which some nurses thought characteristic. Dehydration was early and profound, and toxæmia was present. Vomiting was intractable and preceded by a troublesome short cough. On the fifth or sixth day, rarely before, the temperature went higher, and with this there was unmistakable evidence of otitis media or bronchopneumonia, or of both. Death occurred in 40 to 50% of the cases and was preceded by coffee-ground vomit, hyperpyrexia, and often convulsions. Necropsy showed fatty degeneration of the liver in all, patchy congestion of the intestinal mucosa, and a few pinpoint ulcers. Pus in the middle ear was common (23 out of 32) and also bronchopneumonia (13 out of 32). He considered the otitis media and the bronchopneumonia to be secondary infections and not causes of the diarrhoea and vomiting. He had tried paracentesis years ago, but all his cases had been ultimately fatal and had showed no improvement after the operation. *H. influenzae* or pneumococci had been found on plating straight from the paracentesis knife at the bedside. Type A behaved like an acute specific infection which affected both the respiratory and the alimentary tracts, giving rise to a fatal toxæmia (or septicaemia) with frequent secondary infection of the middle ear and lungs. Clinically its spread resembled that of a virus droplet infection.

Type B was a much milder disease with an incubation period of 8 to 10 days. The onset was more gradual, with diarrhoea, vomiting, and pyrexia. Stools were more often relaxed than watery. Dehydration was in proportion to the fluid lost, and if corrected did not tend to recur. The cases were often not admitted to hospital for a whole week. There was no otitis or bronchopneumonia as early as the fifth or sixth day; the mortality in hospital cases was less than 10%. The disease behaved like a primary "enteral" infection, and it was probably this type which could be safely nursed in a "barrier" ward. The stools showed a variety of organisms of doubtful pathogenicity, but dysentery organisms were not found.

Faced with different types of infantile gastro-enteritis of different aetiologies and methods of spread the medical officer of a fever hospital had no choice but to isolate every case in a separate room. The barrier ward had become obsolete in the treatment of gastro-enteritis. In addition, a sufficient number of well-trained nurses was needed, the ratio of nurses to patients being higher than in any other ward.

Mr. E. F. GALE said that a group of workers at Cambridge had found large numbers of  $\beta$  haemolytic Group D streptococci as a "feature" of the stools in certain outbreaks of neonatal diarrhoea. These organisms had (1) an unusually

high tyrosine decarboxylase activity, and (2) the power to establish themselves in the faecal flora of the infant rat or man, properties not possessed by normal enterococci. Feeding these organisms to infant rats resulted in a fatal diarrhoea which was most marked when the diet was such as to render the intestinal medium optimal for the action of tyrosine decarboxylase; and the syndrome could be imitated by feeding tyramine itself. Older rats were not susceptible to the action of either the organisms or the amine. Estimations of the tyramine oxidase activity of fresh post-mortem material from infants showed that this activity was deficient at birth in the kidney, liver, and duodenum, but was fully developed by the end of the third month.

Dr. R. SWYER said the diagnostic error among enteritis admissions was high. Mastoiditis could arise as a late complication, but some of these cases were due to hospital infections: this view was supported by finding haemolytic streptococci in a high proportion. Dr. H. S. BANKS said that before the war the paracolony group of organisms appeared to have some place in aetiology. He felt that experiments on young animals (up to three weeks of age) were indicated. Dr. T. E. D. BEAVAN argued strongly for *ad hoc* gastro-enteritis units in children's hospitals. One of the problems of the disease was the comparative immunity of children from 12 months to 2 years and the absolute immunity thereafter. Infants with minor ailments, particularly skin diseases, should not be admitted to hospital because of the high risk of enteritis. He agreed that in the presumed infective group of unknown aetiology there were two distinct types. The odour of a severe case could best be described as spermiatic. Dr. JANET GIMSON, while stressing the need for parenteral fluid therapy, said that the intravenous route in infants was often difficult for inexperienced medical officers. She favoured bone-marrow transfusions because they were simpler to institute and could be maintained at a constant rate more easily than intravenous drips. She demonstrated a short needle with a strut-supported adaptor suitable for marrow transfusions in infants as it was not easily displaced. Dr. J. BRAY wondered if Mr. Gale had done animal-feeding experiments with amines, and pointed out that a number of organisms which were normally present were greatly increased in the presence of enteritis. In reply, Mr. GALE said that young rats (up to ten days) did develop diarrhoea when fed on tyramine. He had never met a coliform organism which produced an amine in significant quantity.

### MUSCULAR FACTORS IN FOOT FAULTS

At a meeting of the Manchester Medical Society on April 12 Mr. W. SAYLE CREER gave a lecture, which was illustrated with a cinematograph film in colour, on some foot faults related to form and function. He said that many patients complained of aching in their legs, and while some of them had foot deformities others had no obvious defect to explain the symptoms. The aching was due to muscle fatigue, which was caused by muscle overwork, and the reason for this overwork was as follows. In the normal foot unit, which meant all the tarsal bones below the astragalus, or talus, the inherent strength and shape was such that the foot was in stable equilibrium with the ground. A very common defect was an incompetent first metatarsal. This phrase meant a failure of the supporting action of the first metatarsal due to a hypermobile first metatarsal and internal cuneiform, a permanently elevated metatarsal, or a short first metatarsal. As in the case of a three-legged stool with a defective leg, the foot fell over to the inner side; Americans called the condition "pronation." The joint at which the movement took place was between the astragalus and foot unit, and in order to balance the foot the patient had to use the muscles excessively. This pronation, which was not by any means the same thing as the rare flat-foot, was the common deformity found in children and in quite a number of adults.

Other causes of muscular fatigue were factors which altered the relative tonus of opposing groups. Any painful condition of the foot—such as a corn, a wart, a callosity, or projecting nail in the shoe, or shoes which were too tight—would, by its reflex effect, diminish the tone of one group in an effort to prevent pain, and consequently increase the

tonus of the opposing group. This led to incoordination and symptoms of muscle strain. There were many factors outside the foot—such as tightness of the tendo Achillis, "squinting" knees or internal rotation deformity of the femora, tight hamstrings, excessive lordosis with its associated flexion of the hip-joint—which affected the work that various groups of muscles had to perform.

In examining the foot, small deviations from the normal had to be looked for, for the foot was a small object and deformities were very often anything but gross and obvious. In the majority of cases it was not necessary to carry out elaborate surgical procedures; the patient could be made comfortable by suitably altered footwear and the right kind of physiotherapy. The commonest type of surgical alteration to footwear was wedging the inner border of the heel and the outer border of the sole. The older method of wedging the inner border of the sole was not mechanically and physiologically sound and not so effective. The surgeon must take great care to impress upon the patient the necessity for keeping the shoes in good repair, for badly wedged or worn shoes "wobbled" and gave rise to additional muscle fatigue so that the symptoms were not relieved.

The annual congress of the Ophthalmological Society of the United Kingdom was held in London at the R.S.M. on March 31 and April 1. Among the visitors were ophthalmic surgeons of the American Armed Forces. The president, Dr. H. M. TRAQUAIR, after welcoming members and visitors, gave his presidential address on "The Nerve-fibre Bundle Defect." It was a valuable and enjoyable congress, and many of the papers gave rise to interested discussion and comment. All the proceedings, together with a report of the joint clinical meeting, will appear in the *Transactions of the Ophthalmological Society of the United Kingdom for 1944*.

The Whipps Cross Hospital Medical Society held its first public meeting on April 14 when Mr. D. G. Ardley gave a lecture on the chemotherapy of bacterial infections. There was a good attendance of local practitioners. The next meeting, which will be clinical, will take place at the hospital on Friday, May 12, at 8.15 p.m. Practitioners who wish to show cases should notify the honorary secretary of their intention at least 14 days beforehand.

## Medico-Legal

### CONTINUOUS CARE AND TREATMENT

Abundance of caution was probably responsible for most of the defects of "Herbert's Act"—the Matrimonial Causes Act, 1937. Among other grounds the Act allows a party to a marriage to be granted a decree of divorce on proof that the other party is incurably of unsound mind and has been continuously under care and treatment for at least five years immediately before the date of the petition. The definition of "under care and treatment" has already caused difficulty, and recently has been shown to conflict seriously with the best-accepted treatment of persons of unsound mind. The usual form of care and treatment under the Act is detention in pursuance of any order or inquisition under the Lunacy and Mental Treatment Acts. As the care and treatment must be continuous, if the continuity of the detention has been broken in any way the petitioner cannot have his/her divorce. In *Shipman v. Shipman* (1939) the wife had been sent out every year for a long period between Christmas and the spring to live with her sister; the President held that absence on trial for prolonged and indefinite periods must be on the wrong side of any reasonably drawn line between continuous and interrupted detention. In *Green v. Green* (1939) the husband was sent for a fortnight to a house belonging to the Mental After-Care Association; he was under the charge of the association's officers as agents for the local authority maintaining the hospital from which he came. The President did not think the detention was interrupted. The most recent case,

however, *Safford v. Safford* (1944)<sup>1</sup> turned on the question whether release on trial interrupts the detention or not. The husband was sent out twice in the summer of 1942—for fifteen days and forty-four days—and between the two periods he was back in hospital for a week. The orders were made by visitors on the advice of the medical officer, according to the Lunacy Act. On behalf of the Official Solicitor it was indicated that the Board of Control would greatly welcome in the interests of patients a decision which would, without incurring the risk of defeating the inchoate rights of petitioning spouses, encourage the use of release on trial, which medical superintendents regard as very beneficial in favourable cases, and as tending at least to alleviate the tedium of detention. Counsel on both sides invited the President to hold that the detention was continuous, but Lord Merriman regretfully decided that he could not do so. None of the relevant Acts defines the word "detained," and he felt bound to assume that if Parliament had intended the mere existence in force of a reception order to be sufficient, it would have said so. Except for daytime absences and the leave of absence for three nights or four days which a superintendent may grant under the regulations, which may be disregarded under the *de minimis* principle, there must be something which can be described as continuous detention in the mental institution itself, or something that may fairly be regarded as its equivalent. He could not bring himself to hold that absence on trial for substantial periods satisfies those requirements.

On the wording of the Act it is difficult to imagine how the President could have held otherwise. In the Scottish Act, which was passed a year later, the position is different, for that Act expressly provides that a person is "under care and treatment" while an order for his detention is in force, and when he is absent from the mental hospital the order remains in force, and detention therefore persists, for 28 days. Hence, if the patient's leave of absence is kept within that period, no question arises. Of the many amendments which the English Act requires, this seems to be the most urgent.

#### MENTAL HEALTH LEGISLATION IN SOUTH AFRICA

During the current sessions of the Union of South Africa House of Assembly legislative changes of a revolutionary kind have been made in the Mental Disorders Act of 1916, which is now amended so that the superintendent of a mental institution can no longer be compelled to retain anybody brought there at the request of any policeman. The amendments also empower judges and magistrates to commit accused persons suspected of suffering from mental disorder directly to a mental institution for observation, instead of ordering them to be held in a prison to await the Governor-General's decision. Provision is also made for the admission, for a period not exceeding twelve months, of persons suffering from apparently curable mental disablement as voluntary patients, the cardinal object being that no court order of certification is necessary. The commissioner of the institution has the power to discharge such patients at his discretion, and either the patient or next of kin has the right to apply for immediate release on conditions such as prevail in this country.

In the debate the Minister of Welfare and Demobilization, Mr. H. G. Lawrence, refused to accept an amendment absolving relatives or guardians of mental patients from paying for their maintenance. The Minister said that the Government had difficulty in accommodating patients, the present shortage being about 400 beds for Europeans and 2,500 for non-Europeans.

<sup>1</sup> *Times*, March 14

The National Union of Students (3, King's Parade, Cambridge), the representative body of students in 103 universities, university colleges, technical and training colleges in England and Wales, is at present working on student health problems in co-operation with the Scottish National Union of Students, the British Medical Students' Association, and the British Dental Students' Association. It has been concerned with this problem for some time, its activities having included the publication of a report on student health in 1937, and the encouragement of a scheme to establish an international student sanatorium. The war made impossible the immediate implementation of long-term proposals. Therefore an interim programme is being put forward which aims to keep students fit enough to meet their present responsibilities and to use fully and improve existing services in such a manner as to pave the way for a more thorough reconstruction after the war.

## Correspondence

### Publication of Anaesthetic Misadventures

SIR,—Dr. John Elam has campaigned persistently for safer anaesthesia. His latest suggestion on page 263 of your issue of Feb. 19 is one of the brightest ideas I have yet heard of for reducing the incidence of anaesthetic misadventures, major and minor. If put into practice it would indeed be effective, but in its present form it pre-supposes exceptional honesty on the part of the anaesthetist, and a considerable increase in the size of your *Journal* if it is to be the medium of confession. Before making a proposal as to how Elam's suggestion might be modified, I give my own full list of misadventures, three in all, in the belief that published evidence of this nature, if accumulated, would be of value to younger anaesthetists. I exclude a case of amputation for gangrene in an elderly woman already unconscious and moribund when brought to operation as a last desperate resort.

1. Overdose of anaesthetic. Many years ago an adult man died during a minor operation. At necropsy the sympathetic pathologist stressed a fatty heart and liver. At the inquest I was even commended on how I had dealt with the situation. Only I knew that that patient had died from my "pushing" the anaesthetic to subdue the patient's reflexes quickly. This death was due to bad anaesthesia, and yet is probably listed for statistical purposes as "fatty degeneration of the heart."

2. Mental deterioration following nitrous oxide. Anaesthesia was induced and maintained with nitrous oxide, but the operation did not commence for almost an hour owing to the surgeon's encountering unexpected difficulties with the previous case. On recovery the patient was restless, irritable, and irrational, as described by de Courville in his book *The Untoward Effects of Nitrous Oxide*. The patient died on the fourth day from pulmonary collapse. Necropsy was refused. I have no doubt that the sequence of events was attributable to prolonged anoxia due to a misuse of nitrous oxide.

3. Amputation of forearm resulting from pentothal injected inadvertently into an artery. This case was published in the *Lancet* of Nov. 6, 1943, page 571.

The pages of the medical journals testify that anaesthetists, like other mortals, rush into print more readily with their successes than with their tragedies—yet it is from the latter that more can be learnt. Anaesthetic misadventures are not rare. The accidents I have heard of recently varied considerably in character. One can well imagine the mortification of giving pentothal intra-arterially on two different occasions, each followed by amputation; the paralysing effect of injecting the wrong drug intrathecally; the tragedy of leaving the anaesthetized patient unattended for a short period to find him dead on return; of having been responsible for an explosion through ignorance of elementary physical facts; of giving chloroform under the impression that the bottle contained ether; of giving a lethal overdose of pentothal, or of local anaesthetic drugs such as cocaine and amethocaine. The cause of tragedies such as these is obvious; others are not so overt. Death on the table is a clinical problem, and in the great majority of cases the anaesthetist is the only one who can give a clue as to what went wrong; if he is frank enough to give a detailed anaesthetic history of the sequence of events prior to death his story will be far more illuminating than the most searching necropsy.

A striking fact is that anaesthetists seldom make the same mistake twice. Who has heard, for example, of the anaesthetist who has had two deaths from so-called status lymphaticus? He may make many mistakes once. This is because he has perforce to learn in the hard school of his own experience, since the misfortunes of others are not readily available to him. This can be remedied. The publication of anaesthetic misadventures in a form in which the victims can be identified by the lay public is obviously undesirable. I think, however, they could be collected and published in book form from time to time. To avoid social or legal repercussions it might be desirable to confer anonymity on the anaesthetist. The Association of Anaesthetists is now a large and powerful body. A Misadventure Subcommittee might be formed to which fellows and members could bind themselves to notify their misadventures. There would soon be available valuable

reference books of what not to do. Alternatively, an investigation on these lines might be undertaken by some scientific or philanthropic body with adequate funds at its disposal. Such an investigation would pay a good dividend in terms of human life.—I am, etc.,

Oxford.

R. R. MACINTOSH.

### The Hazard of Anaesthesia

SIR,—Much has been written recently in your columns concerning risks attached to the various methods of anaesthesia; in fact, it is rare to pick up a *Journal* without finding an illustration of some new piece of apparatus which is claimed to be of value to the anaesthetist. This seems to me to be making a simple subject into a complicated art, and no wonder that the average R.M.O. cannot be expected to administer anaesthetics with skill when he is called upon to use this massive armamentarium.

I have been giving anaesthetics in different hospitals since 1921, and have tried all the various new agents, such as cyclopropane, spinals, CO<sub>2</sub> absorber, etc., and at last have come back to where I started—open ether, allowing myself plenty of time for the patient's respiratory tract to get used to the irritation of ether vapour, about 8 minutes. The average R.M.O. will have to learn to give anaesthetics himself, as there will not be enough anaesthetists to go round when the second front opens. In fact, under Service conditions one often has to rely upon the assistance of a sensible sister or nurse.

I maintain that open ether given slowly, and if the anaesthetist refuses to be hurried by the surgeon, is as safe as anything can be in medicine. Perhaps there is only one exception, and that is in thoracic surgery, where movement of the lungs has to be controlled; but as most thoracic surgery is best left to specialized units a skilled anaesthetist in this work will be available. To sum up, care, calmness, a good airway, and open ether represent the art of anaesthesia to-day.—I am, etc.,

Rebington, Wirral.

J. M. H. HANNAN.

### What is Psychiatry?

SIR,—In view of the considerable amount of painstaking microscopic research which has been devoted, in many parts of the world, to the study of brain cortical cells in normal and abnormal mental conditions, it is a little disconcerting to find so influential an authority as the Director of the Medical Services Division of the Rockefeller Foundation committing himself to the statement, for which he produces no evidence, that there remains a much more difficult group of (psychiatric) diseases in which *no structural or chemical variation* is known to accompany in characteristic fashion the all-too-obvious symptoms of social, moral, and intellectual inadequacy, (April 22, p. 551).

In the works of Shaw Bolton, G. A. Watson, Bournville, Hammarberg, Sachs, von Economo, Vint, R. M. Norman, and many others, including even my own *Cerebral Atlas*, there is much evidence to refute Dr. Alan Gregg's hypothesis; but perhaps, as much of this is derived from the mental defective, Dr. Gregg wishes it to be inferred that the brain cells of the psychoneurotics are immune from the structural and pathological abnormalities of the lesser breeds of men. Some of the surplus wealth of the Rockefeller Foundation might perhaps be devoted to the elucidation of the truth.—I am, etc.,

Ormskirk, Lancs.

RICHARD J. A. BERRY.

### Ophthalmic Surgeon and Optician

SIR,—The article in the *Journal* of April 22 (p. 560) by Mr. Spencer Walker on the future of ophthalmic work makes me, as one of the members of the Ophthalmic Group Committee, send you some reply. I think I may say that this committee has been for many months past carefully considering the future of medical eye work: work involving ophthalmic medical practitioners, nurses, optician-refractionists, and dispensing opticians; workers of such order as will inevitably be necessary if the new National Health Service establishes regional health centres for certain medical attention, of which, without doubt, eye work would be one form of service. Such

centres may be attached to hospitals preferably. The Ophthalmic Group Committee has drawn up an excellent draft of a scheme for the future. That draft is before all members now. Such a scheme will doubtless involve the National Eye Service as at present working under the direction of the National Ophthalmic Treatment Board, of which I am chairman.

Personally, I think that the work of the National Eye Service has been uncommonly successful and useful. The B.M.A. and the Dispensing Opticians Guild started this service at the request of the special committee appointed by Parliament to consider the claim of the sight-testing opticians presented to Parliament in a Bill laid before the House of Commons. That special committee emphasized the importance of trained medical eye experts, and every item of experience I have had as chairman of this Board has confirmed this.

The work of our National Eye Service has been especially useful when run in clinics. The value of the service is perhaps best shown by the way it filled a serious gap in the Government medical provisions at the outset of this war. The service was of particular use in that catastrophic time. When war threatened an officer of the War Office asked if the Army might make use of the N.O.T.B. organization for the care of the "file" of the Army. On my own responsibility, as chairman of the Board, I replied it could. The work the N.O.T.B. has done for the Army and Air Force since then, and particularly in the early years, has been immense. I wish I could display the figures that I have here before me, with the numbers of the soldiers attended by the N.O.T.B.; I think that would be a surprise to colleagues. But let it be noted that the facility given by the N.O.T.B. organization has justified itself in one respect: the number of recruits referred for eye examination, I have been informed, has exceeded considerably the number referred for all other medical and surgical defects! That fact, shown in the early years of the war, indicates how important are satisfactory arrangements for eye examination, eye care, and eye treatment. There is no doubt that some national and regional eye service for all who do not wish to make their own arrangements will be of high value to our fellow citizens.—I am, etc.,

Crockham Hill.

N. BISHOP HARMAN.

SIR,—The White Paper states that the design of the National Health Service shall be comprehensive from the outset, and be fulfilled as fast as resources and man-power allow. Some temporary limitations of the full service in ophthalmology are expected to be inevitable. During the period of negotiation ahead of us it is the duty of all ophthalmologists to take an active part and endeavour by constructive criticism to find a solution of the problem of laying the foundation-stone of a sound and comprehensive ophthalmic service for the whole community.

In your issue of April 22 Mr. Spencer Walker of Hove submits a solution which, as he says, is similar to my plan, which I have been urging on the profession for a considerable time. He came to his conclusions independently of me, and I have known for some while that there is a large body of opinion among ophthalmologists in support of our views. The Ophthalmic Group Committee has adopted the plan and it is submitted to the profession for approval. It is for this reason that I write to support Mr. Spencer Walker. I know of individual sight-testing opticians who will welcome the scheme, but we do not know what will be their opinion as a whole.

The main argument of ophthalmic surgeons opposed to the scheme is that opticians should not be allowed to do refractions and examine eyes. There is little need to say much to refute this, as most surgeons are fully aware that the optician can do refraction as well as the surgeon. What he cannot do is assess the importance of the error of refraction in the life of the patient, and this brings me to the main argument against the scheme among opticians. They assert that they should have professional status and be independent of medical control. This is clearly impossible, as the ophthalmic surgeon must be the one responsible for the welfare of the eyes of the community, and if he is to be responsible he must have control.

But why must the ophthalmologist be entirely responsible? For two very good reasons. The first is the diagnosis of early disease. It is true that the optician can in a large number of

cases recognize the presence of a disease or an abnormal condition, but there is that percentage of patients in which a pathological condition is overlooked. Even if the percentage of such cases is as low as 1 or 2, that is too many. The training of the optician in the pathology of the eye is quite inadequate, and short of a complete medical training must always be dangerously incomplete.

The second and more cogent reason is the assessment of the importance of a refractive error in each individual case. It is only the ophthalmic surgeon with his medical training who is able to decide whether an error of refraction requires correction, or whether other treatment, either locally or generally, is advisable. It is a common experience to see patients who have been supplied with glasses by an optician and in whom there is found some other and more important cause of their symptoms.—I am, etc.,

Ride.

FRANK HECKFORD.

SIR.—There is much to be said in favour of Mr. Spencer Walker's article on the ophthalmic surgeon and the optician. It has always seemed wrong to me that even the most enlightened ophthalmologists should have to spend much valuable time in prescribing presbyopic spectacles in order to live. There can be no objection to the handing over of the refractions to a sight-testing optician or medical auxiliary provided the patient has been first examined by a doctor and all question of disease eliminated. I believe that such a scheme obtains at the present time in the Royal Naval Medical Service, where opticians come into the category of Sick-berth Steward O.

But even if the opticians are willing to co-operate in such a scheme—and recent correspondence in the Press suggests that some of them at any rate regard themselves rather as consultants than as medical auxiliaries—there still remains the question of finance. From our point of view this may be rather a "bull" than a "bear" point. I do not know what the average sight-testing optician earns, but I should think his income is high, having regard to the price of spectacles and the fact that all classes, irrespective of their financial status, seem willing to buy elaborate spectacles. It is possible, therefore, that an optician may earn more than the State proposes to pay an ophthalmic surgeon, though this is mere conjecture, as, with customary delicacy, this all-important point has been omitted from the White Paper. Now, while we as a profession are notoriously unbusinesslike and take an altruistic view, no one would accuse the opticians of any lack of business acumen. The Minister of Health can hardly offer a higher salary to a medical auxiliary than he suggests for a doctor. I am sorry to finish in such a materialistic vein, but anyone who has read Sir John Anderson's admirable Budget speech will realize that inflation has already set in, and I do not wish to end my career on an inadequate fixed income.—I am, etc.,

Camberley.

LESLIE HARTLEY.

### What is Evidence?

SIR.—I was very sorry to see the article "Assessment of Blood-group Evidence" in the *Journal* of Jan. 22. Even had such an article appeared in a legal journal I should have found it remarkable, but finding it in a journal of medicine is almost beyond belief. For a writer presumably familiar with the reliability of blood-grouping tests and the unreliability of the testimony of witnesses and of subjective judgments of character, to indicate approval of Mr. Mullins in coming to his decision that "he did not, having heard and seen the wife, think she was of a type that commits adultery," frankly amazes me. Your writer goes on to say, "It would be an evil day for our courts if they ever felt obliged to elevate scientific evidence into a class by itself, instead of, as at present, keeping it on the same footing as other evidence." Had your writer said instead, "It would be an evil day for our courts if they ever felt obliged to base their decisions on facts instead of rumours and anonymous communications," I could not have been more astonished. At one stroke you have dealt the cause of the proper use of scientific proof a blow from which it may require literally years, not only in Great Britain but also in the United States, to recover.—I am, etc.,

Boston University, School of Medicine, Boston, MASSACHUSETTS. WILLIAM C. BOYD.

### To Boil or Not to Boil

SIR.—Within the last seven months two samples of milk, as supplied compulsorily to residents in a road, have been sent for bacteriological analysis to the Ministry of Health laboratory in the district. Necropsies of inoculated guinea-pigs gave one sample positive for *B. tuberculosis*, the other for *Brucella abortus*. In the fourteen houses in this small road section, supplied by the one vendor, are living fourteen young children. No alternative milk supply is purchasable, yet public advice to make the milk safe by boiling is not thought desirable. The M.O.H. has been consulted, but replies that "we public health people" consider that general advice to boil milk should be reserved in case a typhoid or other epidemic should make such recommendation a matter of extreme urgency.

So fourteen young children, in homes where extremely high standards of child care are maintained, are left unprotected by the guardians of public health, although the milk supply is demonstrably toxic. The two households who submitted the samples for analysis were "strongly advised" to boil all milk, but this warning would only directly affect two of the fourteen children. Very many others in the area supplied from the same source must also be at risk. If a pasteurized supply is impossible to obtain while the war lasts should not purchasers be warned that milk safety cannot be guaranteed, and that milk should therefore be brought to the boil before allowing children to consume it?—I am, etc.,

ESTHER CARLING.

### Mastoiditis and Mastoidectomy

SIR.—I am very glad of Mr. G. Gordon Mowat's reply (April 8) to my letter on mastoiditis (March 18) because, as he generously states, I do write in very good faith. I feel that this is a very vital question for the medical profession and should be widely ventilated.

The word "mastoid" brings a feeling of dread to the general public. They of course do not look upon it as a very strong bone protecting the ear and giving a point of support to important muscles of the neck. The public have come to think of it as a dread new disease which requires an operation of a very serious and often fatal nature, with frequent great disfigurement and possible facial paralysis, possible deafness, a continuation of and aggravation of the ear discharge with very painful and prolonged dressings after operation.

The operation of mastoidectomy, I believe, originated in Germany and has been performed in this country for roughly the past forty years. The operation became very popular with otologists from about 1910 onwards, and, I contend, became quite a menace to the public. After the last war its popularity came to its full swing. For several years the cry was for immediate operation. This naturally was followed by a great many tragic deaths of healthy people, mostly children and young adults. To break into the mastoid bone, get into an acutely infected middle ear, and then (as was so often done) to chisel away into the attic and remove the bone which separated this septic cavity from the brain was, in my opinion, very faulty surgical technique, and simply asking for trouble.

The frequency of meningitis was alarming, and so many young people died of this in a matter of three or four days to a week after the mastoid operation that it began to alarm otologists. A wiser attitude prevailed, and the practice of waiting until the acute stage of the otitis media had passed became the general rule. Nevertheless, even this wiser policy got a very bad hearing when Dr. Douglas Guthrie of Edinburgh first proposed it at a meeting of the Otolological Society in London some years ago. Now, I am glad to say, his words have sunk in, and, I repeat, it is now generally accepted that it is extremely dangerous to operate upon an acutely infected middle ear. By operation I do not mean paracentesis of the tympanic membrane, for that, I contend, is a proper course to take, and is just assisting Nature rather than waiting until the tympanic membrane ruptures, and it is a proper surgical technique. "Where there is pus, let it out."

Redness and swelling behind the ear, with the ear pushed forward, and a raised temperature, etc., is no reason for mastoid operation. The infection has not passed through the mastoid bone. It would be ridiculous to think that it could do so



## CORRESPONDENCE

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in this hard powerful bone in the space of a day or two, is was contended by those who believed that osteitis of the mastoid bone had taken place. The infection passes along the meatus and infiltrates into the tissues at the back of the ear, causing those so-called symptoms warranting mastoidectomy. This is proved by the great frequency of all those symptoms in furunculosis of the auditory meatus. I have seen similar symptoms after a boxer has received a hard blow over the ear. I have seen similar symptoms in a child with pediculosis capitis, which caused scratching and inflammation of the scalp.

I cannot believe that Mr. Gordon Mowat really means that all cases with a discharge from the middle ear should be subjected to the drastic course of having a mastoid operation performed within six weeks of the commencement of the discharge. How soon would he operate? What mass operation there would be; for a discharging ear has happened to a great many people at some time of their lives. Even furuncle of the ear often takes weeks to clear up, let alone an otorrhoea. Mastoidectomy is a very drastic way of stopping a discharge from the ear, and, alas, it so frequently does not succeed. Personally I would rather have a discharging ear than undergo mastoidectomy, and I know of many more who also would think it the lesser of two evils. However, as Mr. Gordon Mowat says, the symptoms do subside, the discharge does dry up, and very often the perforation itself heals also (the last is my own remark, the first two are Mr. Mowat's), and I simply cannot agree that a state of mastoiditis or osteitis of the mastoid bone remains. So why operate? The danger of meningitis or of abscess of the brain is immeasurably greater when the defences are all chiselled away than when, at the worst, the mucous membrane lining of the middle ear is thickened the discharge is of a chronic non-virulent nature, and Nature herself has sealed off all sources of danger. This is what does happen and always has happened, and it results in a very harmless state of affairs for the patient. The only cases of meningitis and of abscess of the brain I have seen as a sequel to otitis media have been those on which mastoidectomy has been performed. Cases of previous radical or modified radical operation are placed in Grade IV. This is very definite, and shows what medical authority thinks of the expectation of life or of health of anyone who has undergone the mastoid operation.

The alternative to the mastoid operation is treatment of a very simple nature:

- (1) First drop pure hydrogen peroxide into the affected ear; gently mop up secretion; do this several times until the meatus is clear as possible.
- (2) Rest patient on affected side and apply as much heat to that side of the ear as possible.
- (3) It is generally best to give an aspirin or phenacetin powder twice daily to help the inflamed pharynx which originated the ear trouble; it is also soothing and helps to allay pain and allow sleep.
- (4) Great pain is nearly always stopped by dropping in pure methylated spirits, followed quickly, if the spirit itself causes too much of a feeling of burning in young children, by pouring in pure hydrogen peroxide after letting the spirit run out of the ear.
- (5) As the discharge becomes less, add one or two drachms of spir. vini meth. to one ounce of hydrogen peroxide and continue using this as ear-drops for some time.
- (6) Latterly use pure methylated spirit to complete the drying up and healing process: continue this for many weeks, filling the ear with spirit nightly and plugging with cotton-wool; the wool can be removed in the morning.
- (7) Sometimes, for a cellulitis behind the ear or irritation of the skin of the ear, 10% ichthyol in glycerin plain lint is required, and quickly allays inflammation and tenderness.

The general medical practitioner needs only patience, faith, and courage, and he will see results which will astound him.—I am, etc.,  
Edinburgh.

H. HILTON BROWN, M.B., D.P.H.

## Marriage and Parenthood

SIR.—Dr. E. F. Griffith's letter (April 15, p. 540) raises issues of paramount social importance at the present time, not only because there has never been a period as during the last five years when so many young and ignorant couples have rushed blindly into matrimony without the foggiest notion of its complexities, but also because many of the difficulties he outlines will be multiplied and accentuated when the fighting men return to the womenfolk on demobilization. His letter is in point of fact, an amplification of Prof. J. A. Ryle's letter in the *Lancet* of March 27, 1943. Both Prof. Ryle and Dr.

Griffith tend to suggest that doctors are in great part to blame for the ignorance of the public, but I think this is hardly fair. My experience has been that people will ask their next-door neighbours or their friends or the chemist about these matters, any one in fact but the only person whose knowledge is sufficiently thorough to explain things properly—namely, the doctor.

Dr. Griffith states that young people should be encouraged to seek advice. So they should, but many difficulties will be encountered. Those who try will find that it is well-nigh impossible to cleave a way through the jungle of ignorance and prudery which surrounds the vast bulk of the population. It may sound incredible, but my experience goes to show that there are people who are actually prepared to believe that efforts to assist them spring not from a spirit of wanton and vulgar curiosity. I have even encountered a spirit of narrow-minded censoriousness in people who by their education and training should know better, and it is not until a high level of intelligence, coupled with a sound though non-medical education, is reached that one finds even a disposition to regard such matters with a reasonable degree of broad-mindedness. The education authorities are the prime culprits in respect of the public ignorance of sex, and not until they lay a satisfactory groundwork of sane sex education can any progress be made which will enable doctors to exercise their specific educative function.

Dr. Griffith and Prof. Ryle are pioneers, and like all pioneers are a generation ahead of their time. Their voices, I am afraid, stand very little chance of dispelling the prevailing ignorance and prudery of the masses.—I am, etc.,  
J. B. WRATHALL ROWE.

Harrow.

## Colonial Medical Service

SIR.—In your issue of March 25 Dr. Morgan is reported (p. 440) as saying in the House of Commons on March 16 that "the Colonial Medical Service was one of the worst in the world." The exact implication of this generalization and the data upon which Dr. Morgan relied in arriving at it are not easy to assess. But so far as it concerns Tanganyika, Dr. Morgan's statement is strangely misleading. If he means that the medical department is much understaffed I am in full accord with him, but I cannot suppose that his remarks will be of assistance to the Colonial Office in their efforts to rectify the deficiency.

If, however, Dr. Morgan refers to the qualifications or performance of the medical staff he displays gross ignorance of facts which a cursory examination of the reports on the Territory would speedily dispel. The European staff of the Medical Department of Tanganyika, which has been but little augmented in the past twenty years, has not only met all demands imposed by the growth of other Departments, but has extended its activities in numerous directions. During the war it has made large contributions in personnel to the military Services, and has not only maintained its peacetime activities but has borne a greatly increased burden by the examination and care of large numbers of military units stationed in connexion with the country, and a large amount of work and passing through the Department. There has been no etc., has fallen upon the Department. There has been no breakdown or suggestion of failure in the Department, despite all the additional work imposed upon a much reduced staff. Statements such as Dr. Morgan's are such welcome material for the propaganda organizations of our enemies that I feel strongly the need for contradiction.—I am, etc.,  
Boscombe.

J. B. DAVEY,  
Formerly, P.M.O., Tanganyika,  
recently S.M.O., Tanganyika.

## Tuberculin Patch Test

SIR.—Dr. Donald Paterson's tuberculin jelly patch test seems to have much to commend it, but in its place seems to be unnecessarily refined. All that is necessary to do a satisfactory patch test is either or acetone for cleaning the skin, a solid glass rod—such as is used for the instillation of ointment into the eye—and a bottle of crude tuberculin. After cleaning

the skin a drop of tuberculin, the size of which can be controlled within fairly wide limits, is applied to the desired site (since reading Dr. Paterson's article I have been using the "V" sign), and covered with elastoplast. This idea was obtained from an article by Maurice Grozin in the *American Review of Tuberculosis*, Oct., 1943.—I am, etc.,

Penzance.

G. A. M. HALL.

### Tonsillectomy in Children

SIR,—I understand that Mr. Carew-Shaw fears that an evil-minded person who read my letter of March 11 without having seen his of Feb. 19 might think that I had imposed a slur upon his character and reputation. Certainly I had no such intention when I wrote, nor can I even now see that any such interpretation can be put upon my words; but I owe him the sincerest apology for any hurt that I may have done him.

I wrote that letter because of two causes that I have had at heart for many years. The one is opposition to the excessive removal of tonsils. I thought that in minds less acute than Mr. Carew-Shaw's and in hands less skilful his letter might result in an increase in the number of these operations just at the time when we have in view the hope that they may be reduced to reasonable proportions.

The other is the principle that has been accepted by the people that in future there shall no longer be one medicine for the rich and another for the poor. I feared that Mr. Carew-Shaw's contrast of the "private" with the "hospital" patient might result in the same suggestion of a varied service that has arisen under the N.H.I. between the "private" and the "panel" patient, and I felt that any such suggestion should be scotched at once. In trying to do this I used an expression that I had intended to be rhetorical and to suggest a *reductio ad absurdum*; but apparently it can be interpreted as being a slur upon Mr. Carew-Shaw, whereas, in fact, he has enrolled himself among those who have determined that the old conditions shall no longer remain.

I have long contended that the criticisms that have so freely been made against our profession of recent years are due not to any original sin inherent in the members of it but to the conditions under which we have to work; and that it must be the purpose of the medical statesman to provide conditions that will afford the opportunity to give equal service to all. At that and at that only was I aiming when I wrote my letter.—I am, etc.,

Guy's Hospital, S E

T. B. LAYTON.

## Obituary

### J. ARGYLL CAMPBELL, M.D., D.Sc.

We regret to announce the death at Inverness on April 20 of Dr. J. Argyll Campbell, who had been a member of the research staff of the National Institute for Medical Research at Hampstead for 23 years.

James Argyll Campbell, son of James Colin Campbell, M.D., of Bute and Brisbane, was born in Australia on March 30, 1884, and was educated at Brisbane Grammar School and the University of Edinburgh, where he had a brilliant career, gaining nine university medals; he also won the Aitken Carlyle bursarship, the Carnegie and Crichton scholarships, and on two occasions the Vans Dunlop scholarship. He graduated M.B., B.Ch. (with honours) in 1909, received high commendation for his M.D. thesis in 1912, and was awarded the D.Sc. in physiology in 1914. He worked as research assistant to Sir E. Sharpey-Schafer in the physiological department at Edinburgh from 1909 to 1913, in which year he was appointed professor of physiology at the Government School of Medicine, Singapore, retaining that office until he came to London in 1921 to work under the Medical Research Council. During his time in Singapore Argyll Campbell served on a commission of inquiry in one of the Malay States, and was a member of the Medical Advisory Committee on Food Control in Singapore. He contributed to this and other journals a number of important papers on physiological subjects and on lung tumours in

mice and in man, and collaborated in 1925 with Sir Leonard Hill in writing *Health and Environment*, and in 1934 with the late E. P. Poulton in writing *Oxygen and Carbon Dioxide Therapy*. The physiology of oxygen and its uses in medicine had attracted him for many years, and he became a recognized authority on that subject as well as on cancer of the lung.

In his youth Argyll Campbell had been a keen cricketer, playing for Edinburgh University and in inter-State cricket in Malaya. During recent years he was greatly handicapped by deafness. He gave ungrudging assistance to this *Journal* for some years as a leader-writer on those subjects in which he had special knowledge.

### J. MCK. CATTELL

James McKeen Cattell, the American psychologist, who died recently at the age of 83, has been described as the organizer of American science. He was, more strictly, its publisher, for he was the founder and editor of several scientific periodicals, both for the scientifically educated and for those who spoke only a lay language. Cattell made his reputation from the 'eighties onwards in the field of experimental psychology, and psychological research was one of his chief interests to the end of his life. At the turn of the century he was by far the most likely candidate for active leadership in American psychology, but as the years went on he found his greater work in the dissemination of scientific knowledge in general, and thus became a leader and servant of American science as a whole rather than of psychology only. He is said to have been the first American scientist to recognize the great power of print in the promotion of science; the attitude of some scientists, even among the greatest, has been that the publication of scientific work beyond the austere walls of a learned society vulgarized it in some way and perhaps hindered its fulfilment. Cattell took the opposite view. His chief organ was the weekly journal *Science*, published in Pennsylvania, and very much resembling *Nature* in this country. He edited *Science* from 1894 onwards, and it was his boast to have produced an impartial journal in which for half a century any reputable man of science could set forth his honest opinions, however controversial or however much at variance with accepted theory, about any matter of importance. A more popular presentation was afforded by another periodical, *The Scientific Monthly*, and he founded or helped to found a number of other journals dealing with psychology, philosophy, scientific methods, and education. Another useful labour of his was *American Men of Science*, of which the first edition was published in 1906 and the seventh is now in the press. This work called for laborious compilation and fine editing, the kind of task Cattell greatly enjoyed: it was a means of disseminating scientific knowledge in the form of biography.

Cattell was a leading figure in the American Association for the Advancement of Science. He induced it to establish a Section of Education, and himself worked to make it a success. In 1921 he organized the Psychological Corporation. This enabled psychologists, by undertaking practical service for business organizations and individuals, to earn funds to prosecute further psychological research. The venture was owned and operated by psychologists, not for private gain but for the advancement of their science. It now enjoys an income of £120,000 a year. Cattell was president of the American Psychological Society in 1895 and of the ninth International Congress of Psychology in 1929. At the age of 28 he was a professor in the University of Pennsylvania, and at the age of 31 became head of the department of psychology at Columbia. He was dismissed from this latter post in 1917 on a charge of "treason" because he had signed a petition urging Congress not to declare war, but his reputation suffered no lasting harm from that setback. He was a man of highly original character, fearless in urging what he believed.

The following well-known medical men have died abroad: Dr. BERNARD SACHS, an eminent New York neurologist, aged 80, author of *Mental and Nervous Disease in Children* (1926), *Nervous and Mental Disorders from Birth through Adolescence*, and *Keenly your Children Normal* (1936); Dr. LEO WALLACE DEAN, a prominent nose and throat specialist of St. Louis and editor since 1927 of *Annals of Otolaryngology, Rhinology and Laryngology*, aged 70.

## Universities and Colleges

### ROYAL COLLEGE OF PHYSICIANS OF LONDON

#### Election of Fellows

At a meeting of the College held on April 27, with Lord Moran, President, in the chair, the following were elected Fellows:

Norman Kletts, M.B. (Manchester); Dr. W. Winnicott, M.R.C.S. (London); S. E. Tanner, M.D. (Leicester); T. C. St. C. Morton, D.B.E., M.D. (R.A.F.); William Gunn, M.B. (London); A. Wilson Jill, M.D. (Newcastle, Staffs); C. N. Armstrong, M.D. (Newcastle-upon-Tyne); P. H. O'Donovan, M.D. (Nottingham); A. S. Wesson, A.D., F.R.C.S. (London); R. W. Brookfield, M.D. (Liverpool); I. A. Clegg, M.B. (London); W. E. Rees, M.D. (Swansea); P. E. T. Hancock, M.B. (London); A. B. Taylor, M.D. (Birmingham); T. F. Jewer, M.D. (Bristol); I. J. Wood, M.B.E., M.D., F.R.A.C.P. (Australia); G. B. Mitchell-Heggs, M.D. (London); R. E. Tunbridge, A.D. (Leeds); W. I. Card, M.D. (London); C. H. Stuart-Harris, A.D. (London); F. Graham Lescher, M.C., M.D. (Derby); C. T. Potter, M.D. (London); Sir Rupert Briercliffe, C.M.G., O.B.E., M.D. (Barbados); C. G. Barnes, M.D. (London); J. R. Rees, M.D. (London); A. R. Gilchrist, M.D. (Edinburgh); G. L. Taylor, M.D. (Cambridge); Alexander Fleming, F.R.S., F.R.C.S. (London); J. K. Henderson, M.D., F.R.C.P. (Edinburgh); Lieut.-Gen. Sir Alexander Hood, K.C.B., C.B.E., M.D.; Col. W. S. Middleton, A.D., F.A.C.P. (America).

Dr. G. E. S. Ward was appointed external examiner in medicine or the Fellowship Examination of the Faculty of Radiologists. A. Clark, Dr. H. A. Dunlop, Dr. R. V. Christie, and Sir Robert Stanton-Woods were appointed examiners for the Diploma in Physical Medicine. Dr. Leonard Parsons and Dr. Donald Paterson were appointed representatives to attend the conference of the National Association of Maternity and Child Welfare Centres.

The following candidates, having satisfied the Censors' Board, were admitted members:

I. Ansell, M.B., Sheila T. E. Callender, M.D., Joyce A. Keeping, M.D., H. Lim, M.B., Fl. Lieut. D. S. Munroe, R.C.A.F., Y. H. Ng, M.B., apt. C. G. Phillips, R.A.M.C., Flying Officer O. L. S. Scott, R.A.F., apt. P. J. Sweeney, R.A.M.C., G. T. G. Thomas, M.B., Col. J. R. D. Webb, M.B.E., I.M.S.

Licences to practise were conferred upon the following 146 candidates (including 21 women) who had passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the necessary by-laws:

C. C. A. Adeniyi-Jones, T. B. Anderson, W. A. Ashford Hodges, C. G. Attenborough, D. B. Austin, J. P. Barham, J. A. Barlas, D. V. Bates, R. L. atten, M. A. Bazett, M. Bendit, Jean G. Brabner, D. L. Broadhead, Jean A. roughston-Alecock, A. Brown, G. L. Bunton, E. Burman, R. Cannon, McC. Carmichael, Frances N. Carr, A. P. Chaudhuri, Peggy J. Clark, J. M. Clement, S. Coffey, W. R. Cole, M. D. M. Collins, A. Comfort, A. A. Condon, G. N. Cooke, W. E. Craddock, J. A. Daff, J. E. Davies, C. Dawson, C. E. Dent, A. B. Dickie, Mary P. Douglas, I. A. Dudgeon, I. A. Duncan, W. J. D. Eberle, D. A. W. Edwards, G. K. Emsley, L. English, A. M. Evans, E. A. Fairburn, Mary Farquharson, T. R. Arrimond, R. L. M. Ferrari, C. G. Fox, S. Freedman, J. Fry, J. H. Gibson, I. McC. Giles, M. T. Gillies, M. L. Grime, B. Green, B. V. I. Greenish, Cecile Greig, S. C. Harper, H. L. Harris, W. R. Harrison, C. J. V. Hellivell, M. Hill, C. B. Holmes, H. Howell-Jones, Rachael C. A. Hunter, I. G. Jackson, D. M. M. Jones, J. G. P. Jones, V. H. Jones, H. Kaufman, M. D. Leates, J. V. Kent, A. C. de C. Kerr, Eileen Keveney, June M. Kingan, Elizabeth M. Kingsley Piers, Joyce E. Landau, F. W. Lapage, L. G. H. e Clercq, J. C. S. Leverton, L. N. Lightstone, D. W. R. Lyle, J. D. M. Lytle, F. M. MacDonald, P. N. MacGinnis, I. L. McKelvie, J. L. F. Maine, heila M. Martin, M. B. Matthews, E. V. M. Medill, J. L. Middleton, I. Milton, Stella M. Murray, Constance B. S. Napier, R. W. Nash, H. M. Joorooya, K. W. Oldham, K. Owen, C. R. Oyler, D. B. L. Pailthorpe, E. Pembrey, P. B. Philip-Smith, T. L. C. Pratt, Kathleen L. Prendergast, R. Prentice, C. F. G. Pridoux, D. H. Rees, R. E. Rees, T. H. Richards, F. Roberts, J. Roche, R. C. Roxburgh, D. Ryan, J. R. T. Selby, W. S. ellars, E. S. Shalom, Patricia E. Sichel, O. A. Silis, P. H. Smith, W. H. R. mith, H. P. Speed, S. J. Steel, T. R. Steen, J. W. Stewart, Catherine Storr, W. Suleiman, J. L. Taylor, G. H. Tee, Barbara K. Thompson, D. A. Tilsley, P. Todd, W. G. Toole, F. I. Tovey, P. M. Tow, D. R. D. Vanstone, H. H. D. Veale, J. L. Wakelin, Jean M. Watson, B. L. Whitehead, J. D. A. Whitehaw, Marjorie J. Williams, J. L. Winkler, M. P. Winstanley, A. B. Wood, J. E. Wood, G. S. Yeoh.

Diplomas in Ophthalmic Medicine and Surgery (17), and Medical Radiology (5) were granted, jointly with the Royal College of Surgeons of England to the persons whose names were published in a report of the Royal College of Surgeons of England in the Journal of March 18 (p. 409). Diplomas in Child Health were granted to the 16 persons whose names were published in the report of the meeting of the Royal College of Surgeons of England in the Journal of April 29 (p. 605).

### UNIVERSITY OF OXFORD

In Congregation on April 3 the following medical degrees were conferred:

B.M., B.Ch.—J. B. Jeffries, W. S. Hamilton, W. E. Ormerod, G. R. enning, R. G. Harrison, T. Bell, P. P. H. Schmidt, Margaret M. Shattock, oan M. Levitt, and V. W. Zetlin and J. M. K. Marsh (in absence).

### UNIVERSITY OF CAMBRIDGE

The Linacre Lecture will be delivered by Col. Elliott C. Cutler, M.D., Chief Consultant in Surgery, U.S. Army, European Theatre of Operations, Moseley Professor of Surgery in Harvard University, to-day (Saturday, May 6) at 5 p.m., in the Lecture Room of the Anatomy School. The title of the lecture is "A Surgeon Looks at Two Wars."

The following have been approved for the degree of M.D. in absence: T. B. L. Bryan, A. J. Daly, S. T. Anning.

## Medical Notes in Parliament

### Penicillin Clinical Trials Committee

Answering Major Lyons on April 19 Mr. ATTLEE said the only change in membership of the Penicillin Clinical Trials Committee (set up by the Medical Research Council) since a previous answer on June 10, 1943, had been the appointment of six additional members. A report on the use of penicillin in treating war wounds was published on March 24 as Medical Research Council War Memorandum No. 12. A full account of work done at one of the main centres where trials were being made was published in the *British Medical Journal* on April 15. Further reports were being prepared. There was close contact between the Council and the firms manufacturing penicillin, who were represented on it.

Mr. LEVY: Is my right hon. friend aware that the *British Medical Journal* is a very illuminating journal, which ought to be circulated much more widely than it has been in the past?

Mr. ATTLEE later named the present members of the Committee, as follows: Prof. H. R. Dean (chairman), Prof. J. H. Burn, Dr. A. N. Drury, Surg. Vice-Admiral Sir Sheldon Dudley, Prof. A. Fleming, Prof. H. W. Florey, Dr. A. M. H. Gray, Dr. P. Hartley, Mr. R. Vaughan-Hudson, Air Vice-Marshal G. L. Keynes, Prof. J. R. Learmonth, Major-Gen. L. T. Poole, Dr. C. M. Scott, Dr. J. W. Trevan, Prof. R. V. Christie (secretary), and Prof. L. P. Garrod (assistant secretary).

### Gold Treatment of Arthritis

On April 20 Major LYONS inquired what was being done by the Ministry of Health in the development of the gold treatment for arthritis. Mr. WILLINK said clinical research into the value and correct dosage of gold salts in this form of rheumatic disease had been continued by the Empire Rheumatism Council, whose latest report said that no definite conclusions could yet be announced. The results reported as having been obtained by this form of treatment up to the present by no means justified any claim that it was uniformly successful.

### Increase in Short-term Sickness

Mr. WILLINK, answering Sir Henry Morris-Jones on April 20, said sickness benefit claims of approved societies showed a material increase in 1942 and a further rise in 1943, as compared with the pre-war average, in short-term sickness among insured persons, both men and women. It was not possible to state the precise extent of the increase. There was no statistical information available on sickness among domestic housewives. Detailed information on mortality rates was not yet available, but a provisional count indicated that the death rate in 1943 was slightly higher, at 11.1 per 1,000 population, than the figure of 10.5 recorded for 1942.

### Mental Health Services

In reply on April 27 to Mr. Ritson Mr. WILLINK said it would not be feasible to undertake a full restatement of the law of lunacy before the introduction of the National Health Service. At this stage, therefore, it was proposed only to make such amendments as were needed to enable the administration of the mental health services to be included in the one comprehensive service. These would be discussed with the local authorities and others concerned. No general survey of the mental health services was contemplated, but a special survey of certain important aspects, with particular regard to the provision for neurosis, was in progress.

**Tuberculous Ex-Service Men.**—Mr. McNEIL on April 4 asked the Secretary of State for Scotland whether there was any priority of medical treatment for ex-Service men afflicted with tuberculosis in any of its forms, or whether medical officers of health, in granting priorities of treatment, had regard solely to the medical needs of the patient. Mr. JOHNSTON replied that local authorities gave the necessary treatment as quickly as possible to ex-Service men suffering from any form of tuberculosis. Where sanatorium treatment was not required this usually presented no difficulty. Most local authorities, however, had a waiting list of tuberculous patients who required

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May, 1944

Disorders of the Skin

# THE PRACTITIONER

Month by month THE PRACTITIONER provides the medical profession with carefully prepared articles on selected aspects of medical practice. Each issue is designed as a monthly aid in post-graduate study. Thus the January number dealt with "Problems of Rheumatism"; February with "Diseases of the Eye"; March with "Gynaecology"; April with "Indigestion" (special number, price 5/-). In addition to the monthly symposia THE PRACTITIONER brings to the notice of subscribers advances in medicine and surgery, practical points culled from the world's medical literature, notes and queries, and reviews of books.



## CONTENTS OF THE MAY ISSUE (Symposium on Skin Disorders)

- Sulphonamides in Dermatology.*  
By H. W. Barber, M.B., F.R.C.P.  
*Scabies.* By Henry MacCormac, C.B.E., M.D., F.R.C.P.  
*The Causes and Treatment of Acute Dermatitis.*  
By J. Ferguson Smith, M.D.  
*Acne Vulgaris.* By John T. Ingram, M.D., F.R.C.P.  
*Skin Disorders in the New-born Infant.*  
By J. L. Henderson, M.D., F.R.C.P. (Ed.)  
*The Therapeutic Use of Penicillin.*  
By Professor Lawrence P. Garrod, M.D., F.R.C.P.  
*Heredity of Blood Groups.* By R. M. Walker, M.D.  
*The Treatment of Infections of the Hand: the Necessity for a New Approach.* By David Patey, M.S., F.R.C.S.  
*The Interpretation of Physical Signs. V.—In Otolaryngology.*  
By F. C. Ormerod, M.D., F.R.C.S.

The JUNE issue will deal with

## DISORDERS IN WARM WEATHER

Through a recent increase in the paper ration allowed by the Paper Controller to all periodicals, THE PRACTITIONER is again in a position to enrol a limited number of new subscribers. The first four issues of the year are now entirely out of print. New subscriptions are invited from the May issue onwards, at a cost of £2 2s. per annum, post free at home and abroad. Single copies may be purchased at 4/- post free. Orders with remittances should be sent to:—

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A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

1943 (Corresponding Week

A dash — denotes no cases; no return available.

1943 (Corresponding Week)

Notes in Brief

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.  
† Includes puerperal fever for England and Wales and Eire.  
‡ Owing to evacuation schemes and other movements of population, death rates for Northern Ireland are no longer available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever Deaths	96	51	35	1	2	103	9	29	2	7
Diphtheria Deaths	616	27	201	100	26	723	34	187	100	24
Dysentery Deaths	179	21	114	—	6	107	13	45	—	1
Encephalitis lethargica, acute Deaths	2	—	3	—	—	2	1	1	—	—
Erysipelas Deaths	—	—	49	12	6	—	—	58	12	1
Infective enteritis or diarrhoea under 2 years Deaths	2,578	273	239	382	3	16,732	1,041	687	7	90
Measles Deaths	67	3	25	—	—	91	4	20	—	—
Ophthalmia neonatorum Deaths	2	—	1(B)	—	—	3	—	2	—	—
Paratyphoid fever Deaths	983	62	10	2	4	1,139	70	7	13	11
Pneumonia, influenza* Deaths (from influenza)	27	4	1	2	—	43	1	4	1	2
Pneumonia, primary Deaths	—	68	273	36	15	—	49	250	39	14
Polio-encephalitis, acute Deaths	1	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute Deaths	4	—	—	—	—	—	5	—	—	—
Puerperal fever Deaths	163	5	1	3	1	159	7	17	3	1
Puerperal pyrexia Deaths	—	—	—	—	—	—	—	—	—	—
Relapsing fever Deaths	—	—	—	—	—	2,058	173	260	39	53
Scarlet fever Deaths	1,870	89	236	24	75	—	—	—	—	—
Smallpox Deaths	—	1	—	—	—	—	—	—	—	—
Typhoid fever Deaths	5	1	1	13	1	11	2	2	8	1
Typhus fever Deaths	—	—	—	—	—	—	—	—	—	—
Whooping-cough Deaths	1,865	176	56	73	16	1,944	137	277	40	35
Deaths (0-1 year) Infant mortality rate (per 1,000 live births)	392	53	87	33	24	388	54	65	51	31
Deaths (excluding still-births) Annual death rate (per 1,000 persons living)	4,699	728	665	248	139	4,707	682	657	233	156
Live births Annual rate per 1,000 persons living	7,353	861	975	470	287	6,550	764	1,019	401	309
Stillbirths Rate per 1,000 total births (including stillborn)	256	19	37	—	—	—	236	27	39	—

## The Services

Air Vice-Marshal A. F. Rook, O.B.E., has been appointed an Honorary Physician to the King in succession to Group Capt. G. S. Marshall, O.B.E., who has vacated the appointment on retirement from the R.A.F.

Capt. G. H. A. Simmons, R.A.M.C., has been mentioned in dispatches in recognition of gallant and distinguished services in the field and Brig. (Temp.) H. G. Furnell, C.B.E., D.S.O., has been mentioned in recognition of gallant and distinguished services in the South-West Pacific.

## Medical News

The *Practitioner* announces with regret that, owing to age, Sir Humphry Rolleston has had to resign from the position of editor, which he has so successfully held since 1928. Until further notice Dr. Alan Moncrieff, associate editor since 1934, will act as editor.

At the annual general meeting of the Section of Psychiatry of the Royal Society of Medicine to be held at 1, Wimpole Street, W., on Tuesday, May 9, at 5 p.m. a discussion on morale will be opened by Surg. Lieut. G. Garmany, Lieut.-Col. G. R. Hargreaves, Wing Cmdr. J. H. Hunt, and Dr. A. B. Stokes.

A meeting of the Tuberculosis Association will be held at Manson House, 26, Portland Place, W., on Friday, May 19, when Surg. Capt. W. D. W. Brooks and Dr. A. K. Miller will open a discussion on treatment of the minimal lesion as found by mass radiography. Dr. Joseph Smart will give a short paper on two unusual cases of asthma.

The summer meeting of the Association of Industrial Medical Officers will be held in Birmingham on Friday, May 19, and Saturday, May 20, under the chairmanship of Dr. J. C. Bridge. On Friday there will be a business meeting at the Queen's Hotel, New Street Station, at 4.30 (tea at 4 p.m.), followed by dinner at 6.30 for 7 p.m. at the White Horse Hotel, Congreve Street. On Saturday, at the Tatler News Theatre, Station Street, Mr. E. A. Nicoll will show the new British Council film "Accident Service," at 9.45 a.m. At the Birmingham Accident Hospital, Bath Row, at 11 a.m., a discussion on "Rehabilitation and Industry" will be opened by Prof. Seymour Barling, Mr. William Gissane, Dr. N. T. Glynn, and Mr. G. M. Farrer. Luncheon will be provided at the hospital at 1 o'clock. In the afternoon a tour of the new departments of the hospital has been arranged, followed at 3.15 p.m. by demonstrations and clinical cases. Arrangements for this meeting are in the hands of the local secretary—Dr. W. Jeaffreson Lloyd, Guest, Keen and Netticolds Ltd., Heath Street, Birmingham, 18.

A whole-day conference of the Nutrition Society will be held on Saturday, May 20, beginning at 10.50 a.m., at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, with the following programme: "Budgetary and Dietary Surveys of Families and Individuals, Part II," papers by Miss E. M. Widdowson and Dr. R. A. McCance ("Dietary Surveys by the Individual Method"); Dr. Gertrude Wagner ("Surveys of Methods used in Preparing and Cooking Food"); Dr. G. N. Jenkins, Dr. L. W. Mapson, and Miss M. Oliver ("Laboratory Assessment of Nutritive Value of Meals as Eaten"). Papers on Food Consumption: Data Obtained from Analyses of Institutional Diets will be read by (a) Miss E. M. Langley ("School Diets"); (b) Dr. M. Pyke ("Industrial Canteens"); (c) Dr. A. Lyall ("Hospital Diets"). The openers of the discussion will be Prof. V. H. Mottram, Mrs. Barbara Callow, Dr. C. P. Stewart, and Miss M. C. Broatch. Further details of the Nutrition Society can be obtained from the hon. secretary, Dr. Leslie J. Harris, Nutritional Laboratory, University Field Laboratories, Milton Road, Cambridge.

On May 2 representatives of the Royal College of Nursing discussed with the Minister of Health modern trends in the development of the nursing profession, especially in relation to a comprehensive health service. Lord Horder, who, as chairman of the College's Nursing Reconstruction Committee, accompanied the deputation, said that his committee had been greatly heartened at the speed with which the main recommendations on the committee's first report—that on the assistant nurse—had reached the Statute Book. He briefly outlined the committee's recommendations for a wider and more elastic basic training for the nurses of the future, to include an insight into preventive and social medicine, and experience in certain special branches of nursing not hitherto covered. In this way the young nurse would view the whole nursing field in better perspective, and her interest would be aroused to the scope and opportunity for service in branches at present sadly understaffed. Recognition of real student status for the nurse in training would have a far greater influence on recruitment than any other single measure.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Atiology Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

### ANY QUESTIONS?

#### Frequency of Defaecation

*Q.—I have come across two patients who state that they are in better health when they defaecate only on alternate days than when they try to do so daily. In one patient a type of vagus nerve hyperactivity appeared to occur when daily defaecation was attempted. Can this be explained, and how should it be treated?*

*A.*—No satisfactory definition of constipation has ever been made and it would be difficult to construct a distribution curve of the normal frequency of evacuation of the bowel in this country, owing to excessive bowel consciousness and the advertisement of purgatives on the one hand, and the inhibitions produced by gearing humanity to modern industrial and transport conditions on the other. There is little reason to doubt, however, that there is a range of variation in the frequency of normal evacuation of the bowels, as in other rhythmic functions such as the pulse rate or menstruation. Some people defaecate twice daily, others are upset if they worry their intestines into a daily action and are much better if their bowels are opened only twice a week. The chief physical ill effects of constipation are hardening of the faeces, which may then cause fissures on expulsion, and distension of the bowel, which may bring about reflex disturbances or actual obstruction. None of these is likely to happen when defaecation occurs on alternate days. The psychological effects of constipation are much more subtle, inasmuch as training in bowel habit forms so large a part of the early education of the child. The normal bowel habit of an individual may be the resultant of several physiological and psychological forces, and the attempt to disturb it may well arouse unconscious anxiety. The patient should be assured that an action of the bowels on alternate days is perfectly normal, and that attempts at interference are undesirable.

#### Marital Difficulties and Service Life

*Q.—I am concerned about a delicate problem, which has grown from one or two isolated cases to a number which is assuming proportions I feel need consideration. The patients are married men and all have the same complaint—namely, the inability to obtain an erection when desiring intercourse. In each case the facts are materially as follows: (1) They are healthy, vigorous, active types performing their Service duties efficiently and without undue fatigue. (2) There is no evidence of constitutional or other organic disability. (3) All claim to be fond of their wives and affirm that it is no lack of love or desire on their part (a frequent cause of this disability in other cases). (4) All look forward with keen anticipation to intercourse on their periods of leave or time off. (5) In each case the lack of ability to obtain an erection has caused considerable mental upset to the man, frustration for the woman, and bids fair to upset marital happiness, which in any case, in wartime, is in none too stable a state. In some cases charges of unfaithfulness and lack of love have been made by the wives, which are quite understandable. Men return home or go on leave, possibly pre-occupied with Service problems, or concerned with matters other than domestic. I feel that the basis is a mental one rather than physical, and should I be glad of any help.*

*A.*—The problem of partial or complete impotence in men separated from their wives, especially on military service, can be understood in terms of the psycho-analytic libido theory. It is commonly observed that the good soldier "invests" much of his available emotional energy in an all-male group—i.e., in the questioner's words, he is preoccupied with Service matters. This often means a reanimation of an adolescent pattern of interests and loyalties: without such bonds morale and *esprit de corps* could not exist. To the extent of this change in "libido economy," the wife and home become more remote, the man's attitude divided. Like the adolescent, he nourishes a great fantasy of sexual potency, where in reality there is every gradation between this condition and com-

plete erotic estrangement. It is unfortunately true that the military uni-sexual milieu, devoted to destruction, is antagonistic to Eros, and that the very promiscuity of soldiers is mostly an attempt to allay the fear of impotence arising from this enforced mass regression to the "boys together" level. To the above predisposing situation must be added possible anxiety and rush to catch the earliest train, arrival in a fatigued condition, and the challenge of "proving" one's love and power as soon as possible. As put by a colleague: "He feels he ought to be lusty for his wife instead of settling down for a day or two. . . . He makes it a point of duty to try to do a star performance—and both take the first-night failure as something final." Anxiety and conscious preparation, inferiority, guilt, and suspicion complete the aetiology. In fact both partners have become desensitized and need a period of days to re-establish erotic intimacy. In sexual relations, as in digestion, psychology largely governs physiology.

As prophylaxis a general talk to married men proceeding on leave may dwell on these notions: the possible sense of strangeness, the happiness of a new courtship, the need for being rested and reattuned, and the error of being in too great a hurry. The tone must be friendly, reassuring, and not suggest failure, but rather assume the naturalness of such a state of affairs in most couples separated for a time. In treatment after such an occurrence the wife's doctor may need to co-operate on similar lines, while the man's M.O. prepares him as above for the next occasion—aided in some cases by a suggestive "tonic." Unit M.O.'s should enlist the help—not necessarily by referring the men—of Service psychiatrists, whose duty it is to watch over the mental health of the Forces.

#### Vaccines for Arthritis?

**Q.**—Would you advise treatment by vaccines in a case of arthritis of the spine where there is no obvious locus of infection?

**A.**—The late Dr. Okell, formerly professor of bacteriology at University College Hospital, who suffered from spondylitis, expressed the following opinion: "Is it reasonable to treat a supposed infective disease with a vaccine made from a micro-organism when there is no acceptable evidence that disease is caused by the micro-organism in question? The answer must be, No. . . . There seems no convincing evidence that a human disease has ever been cured or significantly benefited by vaccine treatment" (*Reports on Chronic Rheumatic Diseases*, R.C.P., 1937, 3, 3). No doubt enthusiasts may be found to disagree with this conclusion, but the whole article is worthy of careful study. I am definitely of opinion that in such a case as the question refers to vaccines would be useless, and I have seen many cases in which treatment by vaccines has made the victim of arthritis worse, apparently from sensitization. Rest and general measures to build up resistance furnish in most cases the safest and best line of treatment, though good results have been obtained by deep x rays in expert hands.

#### B. Coli in Urine

**Q.**—I would like advice about a small girl aged 6 with *B. coli* infection of the urinary tract. She was treated for about three months with alkali without benefit; to this was added a course of sulphapyridine, the alkali being continued—again no result. What further treatment should be tried?

**A.**—Treatment with any of the sulphonamides should have cleared up an uncomplicated urinary tract infection with *B. coli*. It should first be determined by bacteriological examination of the urine whether the same infection still exists. Persistence might be due to the co-existence or substitution of another infection by an organism not susceptible to sulphonamides, such as *Str. faecalis*. This infection responds only to mandelic acid treatment, which is also worth trying in the presence of atypical and sulphonamide-resistant coliform bacilli. If antiseptic treatment still fails, there is likely to be some abnormality of the urinary tract, such as a hydro-nephrosis, predisposing to infection and its continuance.

It is assumed in this answer that an infection is known certainly to exist, but it should perhaps be pointed out that female specimens of urine always contain cells and bacteria, including sometimes *B. coli*, which have merely been washed off the vulva. These bacteria may multiply rapidly in the specimen if its examination is delayed, and produce the picture of at least a bacilluria. There are objections to catheterizing a child, but if the diagnosis is in doubt, and prolonged treatment or elaborate further investigation depend on it, an uncontaminated specimen must be obtained.

#### Paralysis Agitans

**Q.**—Can you suggest further treatment for a case of paralysis agitans in a retired medical officer who has spent some years in tropical Africa? Sedative drugs, gland extracts, and vitamin B have been tried without benefit.

**A.**—It is unlikely that residence in the Tropics will have influenced the onset of paralysis agitans. In this case the first point to be decided is whether it is a post-encephalitic syndrome or whether it

is secondary to vascular changes, or simply the paralysis agitans of old age. Because of the chronicity of the condition, very many different kinds of treatment have been tried; most of them have not shown any advantage over more usually accepted drugs such as the alkaloids atropine, hyoscine, and scopolamine. An excellent review of the effects of various kinds of treatment will be found in the clinical study by J. B. Neal entitled *Encephalitis*, published in New York in 1942. It is shown quite clearly that vitamin therapy and gland extracts have no place in symptomatic treatment, whilst sedative drugs have a very slight effect.

In using the alkaloids it is most important to push the dosage to a high level, if necessary, to produce relief of symptoms, and it is also advisable to try different combinations, since there is a great individual variation in response. To do this the patient should, of course, be under observation. Treatment should be begun with small doses and pushed to the limit of the patient's tolerance, care being taken that he has not any evidence of glaucoma. The beneficial effect of persistent exercise and physiotherapy must be remembered.

#### Implantation Cancer

**Q.**—We are all familiar with cancerous growth developing in a scar after operation for cancer (autogenous implantation), but has there ever been implantation of cancer in other wounds—e.g., a surgeon's hand? Has any case ever been recorded of cancer of the penis following sexual intercourse with a woman suffering from carcinoma of the cervix?

**A.**—There are no authentic reports of accidental homologous implantation of cancer in human beings. Deliberate experiments have been made to transplant cancer from one person to another. Thus Alibert allowed himself to be injected with ichorous material from a cancer of the breast (1808). In recent times Senn (1901) transplanted into himself a fragment of lymph node in which carcinomatous invasion had been demonstrated by the microscope. A nodule the size of a pea appeared at the implantation site and remained stationary for two weeks and then regressed.

We now know from experiments on animals that transplantation of cancer from one human being to another would not be likely to be successful in more than a small percentage of inoculations and then only under propitious circumstances—e.g., sterile grafts composed of many thousands of healthy cancer cells, and a near genetic relationship between host and graft. Accidental injury at an operation could not provide the necessary conditions. In a famous case in Paris about 15 years ago a house-surgeon accidentally pricked his hand with a needle which had been used to draw off fluid from a cystic mammary cancer; a sarcoma, which eventually caused death, developed at the site of the injury. This was not an "implantation cancer," since the tumour of the hand differed in structure from breast tumour.

#### Cerebral Thrombosis

**Q.**—What is the treatment for cerebral thrombosis?

**A.**—In the acute stage of cerebral arterial thrombosis, to which the question presumably refers, treatment is directed towards preventing extension of the thrombus by increasing cardiac efficiency, diminishing the clotting power of the blood, and reducing progression of arterial degeneration, which is the prime cause of the thrombus. (Any cause for the degeneration, such as renal disease, diabetes, or syphilis, should be sought.) Rest, fluids, and glucose are needed; purgation should be avoided, and, if fibrillation or cardiac embarrassment are present, digitalis should be given. Injections of strychnine may also help. The clotting time can be increased by injections of heparin, and sodium iodide by mouth is said to diminish the spread of atheroma, though this is very doubtful. Once the acute stage is passed the patient should be got up, and exercises, massage, and movements of the affected limbs should be undertaken. It is most important to keep the muscles working and the patient active.

#### Scissors Gait in Disseminated Sclerosis

**Q.**—Some time ago I became afflicted with disseminated sclerosis. My condition has recently improved, and I now need some rehabilitation exercises which will help me to counter the occasional blocking of left (affected) foot by right foot in walking. I attribute this to the fact that the right foot encroaches on the middle line, thus seeking centre of gravity, but impeding the already embarrassed left foot. This blocking is occasional only and does not seem to be due to definite paralysis or paresis. What remedial exercises are advisable to inculcate a correct sense of centre of gravity? My difficulty is present in walking only. I can stand up from my chair under my own power, and, unsupported, can use my companion hair brushes. I should also like to know where to obtain the latest references to this disease.

**A.**—The symptom which is complained of is surely a slight scissors gait, a more severe example of which is seen in Little's disease. It is due to spasticity which affects the adductor muscles. These occasionally go into spasm with consequent dragging of the leg over the midline. Sparring of the arms might be expected if the

weight of the disease were upon the dorsal spinal cord. I do not think there are any special exercises to relax the spasm, since it is due to over- and not under-action of the muscle. The most recent literature on disseminated sclerosis deals with the theory that it is caused by venous thrombosis in the central nervous system, and many of the references may be found in the *Archives of Neurology and Psychiatry* of the last two or three years.

#### Ridged Finger Nails

**Q.**—What are the causes and treatment of ridged finger nails? The patient has an asthmatic history and is subject to bronchitis.

**A.**—Ridged finger nails with transverse furrows are usually the consequence of some local or general disturbance of nutrition, and may thus be related to attacks of asthma or bronchitis. Median striation describes the ridge extending down the centre of the nail which can be remedied in many cases by small doses of x rays given by an expert.

#### Toxicity of Waterglass

**Q.**—Is waterglass a poison? I have heard of a man who drank about a tumblerful thinking it was lemonade, and died in about two days. In another instance waterglass was given in mistake for glucose. I cannot find any reference to waterglass as a poison in any of my books.

**A.**—Waterglass is a solution of sodium silicate of varying but high alkalinity, and the poisonous effects are most probably due to corrosive poisoning by free NaOH. It would have been interesting to have an estimation of the pH of the actual solution in cases mentioned. It is not unlikely that commercial samples of waterglass may be caustic from excess of alkali. Recent analyses in Germany have shown frequent adulteration with sulphur compounds and with sodium sulphate. When administered to dogs by mouth, waterglass caused inflammation and ecchymoses of the gastro-intestinal mucosa and congestion of the kidneys with infarction of the tubules. By intramuscular injection it was fatal. A dose of 15 gr. (1 g.) to rabbits induced alteration in the blood and fatty degeneration of the liver (*Legal Medicine and Toxicology*, Peterson, Hamis, and Webster, 2nd edition, vol. 2, W. B. Saunders Company, 1923). A case was reported by Eichhorst, 1920 (*Schweiz. med. Wschr.*, Nov. 25, 50, 1081), of a man who recovered after drinking by mistake 200 c.c. (6.75 fluid ounces). Prompt vomiting removed some of the substance, but enough remained to irritate the alimentary mucosa, causing vomiting, diarrhoea, severe abdominal pain, and occult bleeding. Excretion by the kidneys caused albuminuria, tube casts, sugar, acetone, and blood in the urine for a few days. The temperature and blood pressure were raised, and the blood picture showed lymphocytosis.

## LETTERS, NOTES, ETC.

#### Cecil Rowntree Memorial

Dr. A. C. SOMMERVILLE (hon. secretary, Medical Committee, Queen Victoria Hospital, East Grinstead, Sussex) writes: I should be very grateful if you would allow me to call the attention of any of your readers who might be interested in the proposal to establish a Cecil Rowntree Medical and Surgical Reference Library at the Queen Victoria Hospital, East Grinstead, to perpetuate the memory of the late Mr. Cecil Rowntree, F.R.C.S. Apart from his many other activities Mr. Rowntree was honorary surgeon to this hospital for upwards of twenty-five years. His colleagues and his many friends and patients in the neighbourhood will always remember his name with respect for his skill and with gratitude for his many kindnesses. It has therefore been decided to erect some permanent memorial to his name, and it is felt that there could be no better plan than the above. Gifts of books or the means of purchasing them will be gratefully received and acknowledged by the secretary-superintendent of the hospital.

#### Asthma in Children

Dr. ALEXANDER FRANCIS (London, W.1) writes: The article "Chronic Pulmonary Catarrh in Children," by Dr. Brian Taylor (April 1, p. 453), shows a lack of appreciation of the real significance of asthma and other bronchial symptoms. Dr. Brian Taylor evidently considers asthma a substantive disease. He says that in his asthma clinic in 1942, among 63 children under the age of 14, in only 12 cases "did it seem that the condition was a true allergic asthma." There is no such thing as "true allergic asthma." Asthma is only a symptom, comparable with pulmonary catarrh and sneezing. Various allergens are certainly capable of producing attacks of asthma, but they are no more the basic cause of the asthmatic condition than a chill producing an ague is the cause of malaria. I know of cases in which when the vasomotor system has been made stable allergens which once were highly irritating lose their power of producing an attack of asthma. This fetish of allergy seems to have warped our common sense. Undoubtedly climate and

certain subsoils have a marked effect upon the circulation; and if children suffering from pulmonary catarrh and asthma can be sent to Switzerland, as Dr. Brian Taylor suggests, they will lose their trouble, and provided they can live there long enough to establish a proper circulation they can return to this country and remain free, but this is impracticable and in the majority of cases unnecessary. Properly controlled courses of breathing exercises, muscular exercises, and cutaneous massage are essential, and immense good can be done by an almost imperceptible touch on the mucosa of the nasal septum with a fine cautery point. This, by reflex action through the nasal nerves on the sympathetic system, does much to regulate and stabilize the whole vasomotor system.

#### New Zealand Hospital on Fifth Army Front

We have received from the New Zealand Government Offices in London the following note: Within the sound of big guns booming out their hymn of hate New Zealanders man their hospital, the most forward complete hospital unit on the Fifth Army front in Italy. It is a little more than an hour's run from the front line, so that there is quick reception of wounded and sick persons from field ambulance and clearing stations. Less than a month before its establishment this New Zealand hospital was operating in the Middle East. For a short time the staff, with their equipment, were quartered on the east coast of Italy, but within a week of receiving orders to move they were again functioning as a hospital close up the Cassino front. The buildings occupied were formerly Fascist barracks and later a German military hospital. The buildings are modern, divided into bays, conveniently placed for division into wards. The walls are adorned with Fascist slogans which give the patients real entertainment: the highlight selected by the patients is this—"Battle is to men what maternity is to women."

#### Oiling Blankets

MESSRS. OLINOL LTD. (44, King Street, Manchester, 2) write: To obviate any possible further misunderstanding regarding "Olinol No. 1" (the product mentioned in the answer to the question "Oiling Blankets" in your *Journal* of April 15, p. 545) we would respectfully point out that we, and not our friends the Manchester Oil Refinery Ltd., are the originators, manufacturers, and sole distributors of "Olinol No. 1." Misunderstanding has in fact arisen in that several inquirers have written to the Manchester Oil Refinery as manufacturers of the product.

#### Sycosis Barbae

Col. S. G. S. HAUGHTON, I.M.S. (ret.) (Ely), writes: With reference to the question and answer in the *Journal* of April 8 (p. 511), in the majority of cases of sycosis barbae removal of the infected hairs, neither by forceps nor by x rays, is really necessary. A much simpler, quicker, and more satisfactory treatment is to paint the infected area twice a day with liq. ferri perchlor. fortis. Most cases are cured in one week; a few hairs may require extraction, but only a few. The patient after one week has merely to examine his face carefully each day and dab on the liq. ferri perchlor. fort. to any suspicious area. While under treatment no shaving is permitted. This treatment is slightly painful, but that is a minor detail compared with the quick result that is obtained. This treatment was referred to by Lieut.-Col. J. H. Smith, I.M.S. (ret.), a few years ago in the *Journal*. I have used liq. ferri perchlor. fort. in impetigo and sycosis barbae for years, and since using it have not had to try any other, as the result has always been both quick and satisfactory.

#### The Women's Parliament

The London Women's Parliament is an exuberant body. Over 700 delegates from factories, trade union branches, women's organizations, and professional and municipal bodies, and said to represent half a million London women, meet for occasional sessions. The report of the fourth session held recently has been published by the Women's Parliament (24, High Holborn, W.C.1) as a 4d pamphlet entitled *Health and Housing*. The record lacks the restraint of Hansard, and the British Parliament would be greatly affronted if the members took their places to the clicking of camera and the whir of sound track recorders, but at least the women go things done. A Health Bill was passed unanimously in a morning session. This Bill, among other provisions, called for an extension of the Factory Acts in order to establish minimum standards of health and welfare for women and young persons employed in transport and in every form of industry, with a part-time doctor in every enterprise employing 250 people or over, and a whole-time doctor wherever 3,000 or over are employed, also more maternity provision by local authorities, evening sessions at out-patient departments, and the development of real health education, all to be considered as steps towards the establishment of a comprehensive health service. Not content with passing a radical health measure in the morning, the Women's Parliament passed an equally radical housing measure in the afternoon.

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 13 1944

## A NATIONAL HEALTH SERVICE

### REPORT OF THE COUNCIL OF THE B.M.A. TO THE REPRESENTATIVE BODY\*

The Council of the British Medical Association puts forward, for the consideration of the profession, the following draft statement of policy on the Government's White Paper on a National Health Service. It is intended that this statement should be the basis of discussion at meetings of the whole profession called by the Divisions throughout the country. At such meetings, which will be open to members and non-members of the Association alike, local professional opinion on this draft report should be expressed in the form of resolutions and instructions to Representatives at the Annual Representative Meeting to be opened on July 18, 1944.

There is appended to this report the replies of the Minister of Health to a series of questions put to him by the Representative Committee in order that the profession might have some fuller details on certain points before formulating its statement of policy. The Representative Committee has taken and is taking no other steps, and no negotiations will start until after the Representative Meeting in July. The statement in the form finally approved by the Representative Body will constitute the framework within which the Association's representatives on the negotiating body will act. A report from the negotiators will be submitted to an Annual or Special Meeting of the Representative Body before the Association is committed to any course of action. The remainder of the Annual Report of Council on this and other subjects will be found in the *Supplement* this week.

#### SOME GENERAL CONSIDERATIONS

1. The Government has put forward its first thoughts on a National Health Service in the form of a White Paper, asking that there shall be constructive criticism of them "in the hope that the legislative proposals which they will be submitting to Parliament may follow quickly and may be largely greeted." In response to this invitation the Association examines critically the spirit and form of the proposals put forward, and then proceeds to submit its own plan. It recognizes that criticism must be constructive, and relies on the Government's assurance that the proposals put forward are revisional only, and that they can be remoulded in the light of constructive criticism.

2. The medical profession is in complete agreement with the Government's aim to ensure that every man, woman, and child should be able to obtain all the advice and treatment and care which they may need in matters of health, and that the country's all resources are brought to bear upon reducing ill-health and promoting good health in all its citizens. The profession, particularly in the last quarter of a century, has again and again pressed upon the Government of the day developments and amplifications of health provision to this end. That pressure has been almost without avail. For example, the Interim Report of the Consultative Council on Medical and Allied Services (the Dawson Report) in 1920 outlined a scheme of primary and secondary health centres; the British Medical Association in 1930 and again in 1938 published its "General Medical Service for the Nation" which recommended the integration and co-ordination of the medical services; and in 1942 the Medical Planning Commission issued its Draft Interim Report which made further proposals for the organization of the medical services. All these documents are submitted to the Government for consideration.

3. The introduction to the Government White Paper on "A National Health Service" opens with the words: "The Government have announced that they intend to establish a comprehensive health service for everybody in this country." The emphasis in this opening sentence is on *Health*. One might expect this preamble to be followed by a description of the measures to be taken to promote and maintain the health of

the individual. The emphasis, however, shifts to sickness. It is a medical rather than a health service with which the Government appears to be really concerned—a service which is "an essential part of any wider proposals for social insurance which may be put into operation."

4. It is natural that public interest in health should be heightened in time of war. But it is ironical that the Government should begin to display a lively interest in organizing medical services on particular lines at a time when the medical profession and its organizations are almost wholly preoccupied with the problems of war, including the recruitment of doctors to the Forces. The doctors in civilian practice are greatly diminished in numbers as a result of recruitment to the Forces, and heavily overworked in consequence. Many of the younger and more active members of the profession who are vitally concerned with these proposals are in the Services, and effective consultation with them is exceedingly difficult.

5. A controversial issue has been raised at a time when the energies of the profession, like those of the whole community, should be directed to one objective—the winning of the war. It is recognized that housing and employment are social issues of first importance which should be faced in advance of the return of peace. But it is idle to suggest that the recasting of the form of health services cannot wait until there is time and opportunity to give them the care and thought they merit, and until our colleagues in the Forces are back in our counsels and their practices. There is suspicion, not without basis, that these proposals found their first inspiration in a desire to control an independent profession in order to control medical certification and so the outgoings of a Social Security Fund.

6. To agree upon the objects of national reconstruction in the field of health is not necessarily to approve the methods or the time-table proposed. Similarly, controversy on the working out of the plan need not obscure the fact that the ideal of a healthier people is, and always has been, the ideal of the medical profession. Our profession is rightly proud of its past and present contribution to human knowledge and happiness, its zeal and progress in scientific research, and the high standards it has imposed upon itself in its daily work. Nor need it apologize for claiming a prominent place in advising the Government on the paths to be followed and the methods to be employed in achieving this ideal of better health.

\* Members should keep this number of the *Journal* and the *Supplement*, which contains the Annual Report of Council.



There is a tendency in some quarters to foster the illusion that there is nothing good in the free institutions and the free professions of this country—an attitude usually accompanied by a belief in organization as the remedy for all our troubles.

7. Health is not mainly a question of medical services. The public must not be misled into believing that good health depends chiefly upon hospitals or clinics or doctors, or bottles of medicine, or indeed upon organization. Among the principal factors which determine a people's health are sanitation, provision of public water, housing, nutrition, conditions in factory and office, facilities for recreation, and education. Here is ample room for improvement, and for action by the State.

8. An individual's health depends in part on his or her own efforts, on healthy living, on a right attitude towards health and disease. In the field of health education there is still much to be done, if only to compete with that type of disease education which this country, like few others, allows, in the shape of patent medicine advertisement.

9. The work of doctors is conditioned by the state of medical knowledge. Investigation and research are the life blood of medical practice. The discovery of penicillin is likely to prove of more importance to the people of this country than all the health centres and all the intricacies of organization. The State's attitude to medical research may be judged by the fact that its official annual contribution to this work is a mere quarter of a million pounds! This is an indication of what a Treasury-conditioned outlook means.

10. The State is rightly concerned with problems of environment and prevention, with communicable disease, and with some forms of institutional provision. Another function of the State is to co-ordinate good existing facilities for the prevention and treatment of disease, whether they have evolved as a result of State or of independent action. Under its aegis much can be done which might otherwise remain undone.

11. To-day there are overlapping of organization, incoordination of effort, and gaps in service. These should be remedied by co-operative action between the State and the profession, and *not* by the assumption by the State of control of an expert field and those who work in it. The record of the State in health and medical matters contains little to justify the suggestion that either the Ministry of Health or local authorities are sufficiently equipped with knowledge and experience to assume so vast and so potentially dangerous a responsibility.

12. The medical profession has developed, over the centuries, as an independent profession. It has imposed upon itself strict standards, and the whole foundation of its work has been built in an atmosphere of intellectual and scientific freedom. Doctors have jealously fought for their freedom to think and to work in their own way, to hold views which seem to them right, and to practise their profession as they deem to be in the best interests of their patients. They must preserve their freedom to criticize the scientific work of their fellows and the organizations in which they work. The doctor's first allegiance is to his patient, and there has grown up a conception of a doctor-patient relationship which is confidential and wholly personal. Doctors are not prepared to sacrifice these things, and it is not in the public interest that they should be asked to do so. They are not prepared to substitute obedience to the State for loyalty to the patient.

13. In examining or promulgating any plans for a comprehensive medical service the medical profession will resist any control by the State, either political or administrative, which is inconsistent with their intellectual and professional freedom. They fear political influence in medical matters. They fear bureaucracy and red tape. They fear subservience of the clinical to the administrative. Theirs is essentially human work, related to human values, and they fear that it is likely to be submerged in a "service."

14. It is not enough to *promise* that there shall be no interference with the doctor-patient relationship, or that there shall be no regimentation of the profession. The plan must of itself, by the nature of its arrangements and provisions, ensure that there shall be no risk or chance of such interference or regimentation. And any plan must be free from features which suggest that the attack on these essential freedoms may be insidious and delayed rather than obvious and immediate.

15. It is in the light of these considerations that the Association has examined the White Paper. It is inclined to suspect that the inspiration of the Government's document is political rather than medical. It certainly detects in that paper what fatalists call a "trend of the times," a move towards a planned and deliberate central control by the State.

16. The Association believes that in so far as the State engages in the planning of health services it should plan a framework within which individuality and independence can flourish. The State should not seek to do for the people what they can do for themselves. It should not unnecessarily limit their freedom of choice or thought or action. It should do what is necessary, but refrain from the unnecessary. The State should spare from its bureaucratic attentions this form of human activity which, in an atmosphere of independence and freedom, has made more progress than it could possibly have made under the aegis of the State. The medical profession is not prepared to see itself converted into a branch of central or local government, or to become a "collectivized" unit within a free economy.

17. The Government's scheme is based on the principle that a comprehensive medical service should be available as a right, and irrespective of means, to all who want it, such service being paid for from insurance, taxation, and rates. The attitude of the profession is that the service should be available to all who need it, but that it is unnecessary for the State to make provision for those who are both willing or able, indeed prefer, to make it for themselves. Freedom is involved.

18. This is not merely or mainly a financial issue. It is true that under the Government's plan—the so-called 100% plan—private practice will be diminished, as will income from this source. This of itself may be a serious matter for some members of our profession. What is even more important is that a profession which derives its emoluments wholly or mainly from State resources is likely bit by bit to be controlled by the State which provides its emoluments. Here lies the greater danger both to the profession and to the public.

19. Until full details are known of the proposed administrative and professional arrangements and of the social security plan as a whole, and until more information is available as to the proposed machinery for safeguarding private practice among that section of the community which prefers it, the Association cannot commit itself to any acceptance of the 100% principle. Pending fuller information on these points, it reaffirms the wholly reasonable policy that the comprehensive service should be available to those who need it, and that the State should not make provision for those who are willing and able and anxious to provide for their medical service themselves.

### Principles

20. The Association approves the general principles set out in the White Paper, emphasizing that what is more important than their enunciation is their translation into action in the developments to come:—

(i) Freedom for people to use or not to use these facilities at their own wish; no compulsion into the new service, either for patient or for doctor.

(ii) Freedom for people to choose their own medical advisers.

(iii) Freedom for the doctor to pursue his professional methods in his own individual way.

(iv) The personal doctor-patient relationship to be preserved, and the whole service founded on the "family doctor" idea.

Some of the profession's more important criticisms of the White Paper proposals are set out below.

### SOME CRITICISMS

#### Central Administration

21. The central administration arrangements proposed are unsatisfactory. The Minister of Health and his Ministry are still left responsible for a number of functions only remotely associated with health. For example, the Ministry of Health is left responsible not only for such problems of housing

are clearly and closely related to health but for supervising the activities of local authorities in the actual construction of houses. Housing is an important factor in health (as are wage levels). Their design and siting approved, their construction is a matter for architects, builders, and engineers rather than for the Ministry of Health.

22. There is another disadvantage. Housing will be an acute post-war problem, and inevitably Ministers of Health will for some years be greatly preoccupied with its political and financial implications. Responsibility to Parliament for a health service should be sufficient to occupy the energies of any one Minister and his Department. It should not be allowed to become, for political or other reasons, a secondary or subsidiary responsibility.

23. Under the Government's proposals health responsibilities are to remain diffused among a number of different Government Departments including the Ministry of Health, the Board of Education, the Ministry of Labour, the Ministry of Pensions, the Post Office, and the Ministry of Fuel and Power.

24. One exclusion which the Government defends in the White Paper is scarcely justifiable—the exclusion of the industrial medical service. This is an employers' service, provided at the employers' expense. As a result it is common in the bigger and better factories, and much less common in the smaller works and factories where it is needed more. The factory is an important part of the worker's environment, and the medical supervision of the worker at the factory should therefore be linked with the supervision of his home environment, as part of the same health service. The industrial medical service is relatively new, and this linkage should be secured now. The Government's attitude in this is weak and illogical.

#### Central Health Services Council

25. Side by side with the Ministry of Health there is proposed an advisory body, the Central Health Services Council, to represent medical practice and medical teaching, hospital organization, and other professional interests—a body primarily medical. The proposal conforms to the pattern of advisory bodies set up in recent years. Many of these advisory bodies have proved useless because they have not been allowed to become useful. They have been façades to protect Ministers rather than committees to advise them. The Association cannot accept, as an appropriate advisory body to present and make effective medical opinion at the centre, one which is to be appointed by the Minister and to report only through him.

26. This, the usual, method is wholly inadequate in its application to medicine. If a medical (or mainly medical) body is to express the view of the medical profession on medical matters, it should, so far as its medical members are concerned, be appointed by the profession itself and not by the Minister. The hand-picking of such an advisory body would make it useless.

27. Further, in the field of expert medical advice, both Parliament and public should be entitled to know what advice has been tendered and whether it has been accepted or not. Only such safeguards will secure that medical advice is effectively given.

#### The Central Medical Board

28. The Association recognizes that in suggesting the Central Medical Board the Government intended to meet the known objection of general practitioners to enter into their contracts with local authorities. But the proposal to confer upon the Board two important powers has made this part of the White Paper a section to which the medical profession is most determinedly opposed.

29. The two powers are, first, the power to require practitioners intending to start afresh in public practice in any area to obtain in advance the approval of the Central Medical Board; and, secondly, the power to require newly qualified practitioners desiring to take up public practice in a particular area to enter the public service whole-time where considered necessary.

30. Both these powers can be used by "negative pressure" to direct practitioners as to where they will practise in the public service and the type of public practice in which they shall engage. However they are described, they are a form of civil

direction. The proposal to confer them is not made more attractive by the proposal that the Central Medical Board shall be composed mainly of doctors. The Association objects to their being conferred on *any* body—medical or lay or mixed. It recognizes that those who urge a planned economy for this country include as a part of their proposals some measures for the compulsory transfer of labour. The Board provides an illustration of the same trend of thought.

31. Errors of distribution of medical practitioners should be corrected by the process of attraction rather than that of compulsion. The Association is firmly opposed to the application of powers of compulsion either to doctors or to others. Indeed, they savour of a form of organization which this country has been exerting itself to oppose.

#### Local Organization

32. At the periphery the kind of organization suggested in the White Paper is even more chaotic than at the centre. There will be more, not fewer, local authorities. The new type of local authority proposed—the Joint Health Authority—is to be concerned with the planning and administration of hospital and allied services, and with the planning of non-hospital services. No steps are proposed to ensure that either these joint health authorities or their committees will contain persons of knowledge and experience in these subjects. The planning done, and the Minister's approval obtained, the non-institutional services are to be administered by other authorities, the existing major local authorities. Health functions will thus be distributed between more and not fewer local authorities.

33. Health Centres, if established, will be administered by County and County Borough Councils, and hospitals by joint health authorities. Ante-natal centres will be administered by one authority, the maternity hospital by another, while the control of the midwives' service may be vested in yet another. Responsibility for the control of infectious disease will be assigned to one authority, and the provision of infectious diseases hospitals to another. Ultimately school medical inspection may be the responsibility of one authority, and school medical treatment the responsibility of another. The general practitioner will be in contract with the Central Medical Board or both the Central Medical Board and a major local authority. The consultant will be in contract with the individual hospital authority. The public health officer will be in contract with his individual local authority. In brief, what is proposed is fragmentation, not unification, of medical services.

#### The Voluntary Hospital

34. The voluntary hospitals will, if the present proposals survive, be quietly but steadily submerged. Their contracts will be with exclusively local authority bodies which own the other type of hospital—the local authority hospital. They will receive less than the cost of the work they do, and be left to find the remainder in the atmosphere created by the Government "free for all" propaganda. Capital moneys are ignored.

35. The partnership between local authority and voluntary hospitals which the Government promised is to be achieved by virtually placing the voluntary hospitals under the control of the local authority "partner." They are afforded no effective place in the administrative or advisory machinery either at the centre or locally. Lip service is paid to these great institutions. What the White Paper proposals actually mean in practice is their elimination as autonomous organizations in a comparatively short time. These proposals would appear to illustrate once more the urge to control even a form of voluntary organization which, while uncontrolled, has achieved a magnificent standard of service to the community.

#### The Health Centre

36. Group practice, generally in Health Centres, is put forward in the White Paper as the basis of general practice development. The Government speaks of an experimental phase, but the arrangements proposed do not provide a proper basis for experiment. A joint health authority, after consulting the Local Health Services Council and taking or not taking its advice, may with the Minister's consent decide to embark on a scheme of health centres. Thereafter the County and

59. The terms and conditions of service of consultants should, like those of general practitioners, be negotiated centrally between the Minister and representatives of the medical profession. There is much to be said for placing the individual consultant or specialist in contractual relationship with the hospital or hospitals which appoint him, it being understood that the content of the contract is negotiated centrally. It has, however, the real disadvantage that general practitioners will look in one direction for contractual purposes, and consultants and specialists in another. Further consideration will need to be given to this point.

#### Private Practice

60. The future of private practice depends primarily on the proportion of the community to which this service is made available irrespective of means and as a right. The profession's present view on this issue has been stated earlier in this report. Before the profession can consider any modification on this attitude it needs fuller information on a number of points, including the general Social Security contributions, the administrative and professional arrangements, and the machinery for ensuring the continuance of private practice for those who desire to be treated privately.

61. In the case of general practice the points to be considered include the mode of distinguishing between Service patients and private patients, and the procedure to be adopted by citizens intending to utilize the Service for a particular item, or items, of medical service. In the case of consultant and specialist practice the profession needs fuller information as to the procedure proposed in the case of persons seeking consultative service in the consulting-rooms of consultants and specialists, and in private wards, wings, and blocks associated with general hospitals.

62. Whether or not the whole community is covered by this scheme, those who desire to obtain medical service privately should be absolutely free to do so from any doctor of their choice, and every practitioner should be free to render such service on a private basis with access to hospital facilities at every level, should such be necessary. This is an issue of the freedom of the public rather than of the interests of the profession.

## Appendix

### REPLIES BY THE MINISTER OF HEALTH TO QUESTIONS PUT TO HIM BY THE REPRESENTATIVE COMMITTEE

The Representative Committee submitted to the Minister of Health a series of questions on matters relating to the White Paper. The questions and the replies received are reproduced below.

#### Civil Rights of Doctors

**Question 1.**—*Can the profession be given an assurance that doctors who participate in the National Health Service will be allowed to retain as citizens their rights to serve as M.P.s and on local authorities and bodies concerned with the administration of the Service, and what steps will the Government take to protect these rights?*

**Answer.**—Yes. There will have to be exceptions, as there are now, like doctors employed in Government Departments and medical officers of health. But for the profession generally these rights must be fully retained. Any necessary provision to secure this will be included when legislation on the new service is put before Parliament.

#### 100% Issue

**Question 2.**—*Will the Minister give an assurance that the inclusion of 100% of the community in a National Health Service is contingent upon the inclusion of 100% in the national social security plan as a whole?*

**Answer.**—The proposals for the National Health Service were formulated on the assumption that there would also be proposals for a scheme of social insurance covering the whole

community. If for any reason this assumption were not realized the National Health Service proposals would be reconsidered in this respect.

#### Public and Private Practice

**Question 3.**—*By what machinery does the Government propose to make it possible for a general practitioner or a consultant to distinguish between a public patient and a private patient? Apart from the necessity for a general practitioner or a consultant being able to establish those cases in which a fee may be charged, the question is of importance in many different connexions—e.g.,*

(a) *If a patient chooses private institutional accommodation does he thereby relinquish his right to both treatment and accommodation under the public scheme in respect of the current illness? Will the patient be able to avail himself of the public service at any level of an illness and for any purpose, it being understood that in doing so he would have to change his doctor for that purpose—e.g., short-wave therapy?*

(b) *Can a patient be a private patient for general practitioner services and a public patient for consultant and/or hospital services, including radiological and pathological investigations and treatment, and vice versa? Can a general practitioner use public "investigation" services for a private patient?*

(c) *If, in spite of the Government's contract to provide all necessary treatment without charge, the particular service a patient needs is not available in his area under the public service but is available privately, what is the position as regards the payment of fees?*

**Answer.**—The Minister will particularly welcome the profession's help in working out the detailed problems of organization involved in this important group of questions. It seems to him that the general lines might be these:

(i) The general practitioner would treat as public patients any persons who had become his public patients through some suitable machinery to be devised (e.g., of a medical card signed by both doctor and patient.) He would treat as private patients, outside the arrangements of the service, any patients not so associated with him, whether or not they were associated with any other practitioner within the public service. There would need, of course, to be proper cover for people away from their home areas and similar cases, as now.

(ii) People would be entitled to take advantage of the public service at any time, and therefore to change at any time from being private patients to being public patients, either of the same doctor or of another—according to the ordinary process of choice and acceptance. If they thus became public patients of the same doctor, this would not affect any private liabilities incurred by them with him for any period while they were his private patients.

(iii) People would have the right to take advantage of part of the public service instead of the whole—e.g., a person who chose to be a private patient of a general practitioner would not thereby deprive himself of the benefits of the public service in a hospital, or of whatever domiciliary consultant services were made publicly available through the hospital service. Similarly a person who chose to be a public patient of a general practitioner would be free, if he wished, to obtain through that practitioner any specialist consultation privately and otherwise than through the public hospital and consultant services; and also, if he so wished to arrange privately for hospital accommodation and treatment outside the public service.

#### Comprehensiveness

**Question 4.**—*Why should not the scheme be really comprehensive in the sense that a single central authority should be responsible for the administration of all the civilian health services and only for those services?*

**Question 5.**—*What are the reasons for the exclusion of certain services from the scheme outlined in the White Paper—e.g., the industrial medical service?*

**Answer.**—The scheme is intended to provide for all necessary personal medical services. There are other services, con-

## MINISTER'S REPLIES TO QUESTIONS

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nected with the work of other Government Departments, in the operations of which medical advice is constantly required but in which it plays a minor part. If medical advice is to play its full part in such services it must be constantly available and cannot be detached from the administrative framework of those other Departments without losing in force and availability. There is already liaison centrally, and this has become increasingly close in recent years. The White Paper gives the reasons for regarding the industrial medical service rather as a part of the general welfare service in industry than as a part of the personal medical services, and on page 10 reference is made to the importance of increasing use in this work of general practitioners who have received appropriate post-graduate training.

## Sufficiency of Personnel

**Question 6.**—How is it suggested that the number of doctors shall be increased so as to make the proposed service possible?

**Answer.**—It is fully realized that it would be difficult, if not impossible, to operate the new service under present wartime conditions of medical man-power, and that its operation will depend upon a substantial return of doctors from the Forces. But, when judged by more normal standards, there is no reliable means of assessing at this stage what increase, if any, in the supply of doctors will be necessitated by the new service. Particularly bearing in mind the many improvements proposed in regard to auxiliary services which will help to ease the demands on a doctor's time. The total number of doctors in this country has been for some time increasing at the rate of about 1,000 a year, and if the resources of the medical schools are enabled to be used to fullest capacity this rate of increase can be accelerated in the future. The Minister will want to discuss the question generally with the profession's representatives in due course. The recommendations of the Goodenough Committee will, no doubt, be relevant.

## Equality of Sexes

**Question 7.**—Will the Minister give an assurance that in the operation of the service there will be no discrimination between male and female practitioners?

**Answer.**—There is certainly no intention of discriminating between men and women doctors in the new service, apart from obvious kinds of special appointments which may require a woman rather than a man, or vice versa.

## Central Administration

**Question 8.**—What are the reasons why the service should not be administered as a "Corporation" (e.g., B.B.C. or P.L.A.), or as a council of the Privy Council (e.g., General Medical Council or Medical Research Council), or by a body similar to the Board of Admiralty, responsibility still lying through a Minister to Parliament?

**Answer.**—The reasons for vesting the ultimate central responsibility for the service in a Minister of the Crown, with the normal departmental machinery of central government, have been explained on pages 12 and 13 of the White Paper. It is not felt that there is any true analogy between the proposed new service and any of the services or activities with which the bodies mentioned in this question are concerned.

**Question 9.**—What are the Minister's objections to making the Central Health Services Council a body composed mainly of elected representatives—i.e., its medical membership being, in the main, elected, by the medical profession through its organizations?

**Question 10.**—What are the Minister's objections to the publication of reports by the medical group of the Council for the information of Parliament, the public, and the medical profession?

**Question 11.**—Is there any objection to the Council being given a secretariat independent of the Ministry?

**Answer.**—The Minister is anxious to consider in much more detail with the profession's representatives the whole question of consultative machinery, which is only roughly outlined in

the White Paper, and to the success of which he attaches the utmost importance. All the matters raised in these three questions will then need to be examined at some length, and it is impossible to cover the ground adequately in a short answer at this stage.

**Question 12.**—Will the Minister give some further reassurance and explanation with regard to the powers of the Central Medical Board, as the statements made by the Government spokesmen in Parliament have not removed the profession's apprehensions as to its powers of compulsion? The following are examples of the type of question being asked:

(a) If there were a shortage of public service practitioners in a particular area could not the deficiency be remedied by two or more part-time practitioners rather than by persuading or directing one practitioner to practise there whole-time in the public service?

(b) Is it not likely that the Central Medical Board will direct the flow of assistants to practitioners in full-time public service, and that practitioners doing some private practice will have difficulty in obtaining assistants?

(c) Is it the Government's intention that under certain circumstances a practitioner engaged in private practice shall not be able to accept and give treatment under public service conditions to any patient who wishes to receive it from him and to whom he is willing to give it?

**Answer.**—The proposal for a Central Medical Board is intended as a means whereby professional men and women, engaging themselves with the central government in future to take part in a service of general medical practice for the whole population, may be able to have direct contractual relations with a body which is itself predominantly professional. One reason for the proposal was that it was believed that many professional men and women would prefer such an arrangement to a contract either direct with a Government Department or with any local government organization. If this is not so, there are other possible alternatives which could be considered. It is probable, however, that it is not so much on the establishment of such a body, but more on the powers to be vested in it, that reassurance is sought in this question. In this connexion it is to be emphasized that there has never been any suggestion that the Board should have power to direct doctors to any particular area or to any particular engagements. Two powers are proposed in the White Paper in regard to the distribution of public medical practice:

(i) A power to refuse to admit additional doctors into the public service in a particular area if that area clearly does not need them. The machinery proposed for this is a requirement of the Board's consent when a doctor proposes to enter into a new public practice in which he has not been previously engaged.

(ii) A power in regard to new doctors starting in general practice for the first time; a power to say to such a new doctor that, if he wants to engage in the public service in a particular area which is in serious need of a doctor who will give all his time to public practice, then he can only engage himself there on that basis—for his first few years—although he can go elsewhere, of course, without giving all his time to public practice, or he can practise in the area privately.

On the particular aspects of the Board's powers which the question raises:

(a) If two or more part-time doctors were available and could remedy the deficiency equally well, then there would be no need to ask for the whole of the time of the young doctor who wanted to go there. That would be a question of fact in each case.

(b) It is difficult to see why a mainly professional Board should want to do this. But it is in any case a matter which could be corrected by general directions from the Minister, in consultation with the profession.

(c) It is intended that any practitioner shall have the normal right to participate in the service for all or part of his time, subject only to points (i) and (ii) mentioned above.

Generally, in regard to the proposed Central Medical Board and particularly in regard to the question of "over-doctored" and "under-doctored" areas, the Minister will welcome the profession's own ideas and suggestions and the opportunity of a more detailed discussion.

**Question 13.**—*What is the objection to securing a proper distribution of doctors by the attraction of elastic conditions of service and remuneration adaptable to different types of areas—e.g., Highlands and Islands Service?*

**Answer.**—It is recognized that there may be advantages in this for certain types of area if practicable methods can be devised. Any proposals from the profession will be carefully considered.

**Question 14.**—*Is it in the interests of the service that the general practitioner should be under central (or central and local) contract and consultants under local contract? Will this not split the profession?*

**Answer.**—It is believed that consultant services will best be based on the hospitals, and that the engagements of the consultants should therefore be with the hospitals concerned, voluntary or municipal. This is thought to be an arrangement which the consultants and the hospitals would on the whole prefer; but the whole consultant service arrangements have still to be discussed with the profession's representatives, and this point will not doubt be included in the discussion.

**Question 15.**—*What type of person are the part-time members of the Central Medical Board expected to be? Would they be medical practitioners spending the other part of their time in practice, or would they be civil servants?*

**Answer.**—The part-time medical members of the Board would be medical practitioners spending the other part of their time in practice.

**Question 16.**—*What influence is it expected the part-time members could have?*

**Answer.**—The part-time members would be the majority of the Board. A part-time basis is contemplated because it will secure that the Board is mainly composed of members who are themselves actively engaged in medical practice.

#### Local Administration

**Question 17.**—*How can there be comprehensiveness of local administration when the various services are distributed among several different authorities?*

**Answer.**—It is assumed that the question refers not to the "comprehensiveness" of the services given but to the "unification" of the means of giving them. It will be seen from the White Paper that the main key to that unification is in the arrangements for a single area plan, prepared locally by the joint authority with full professional guidance and approved centrally by the Minister, and covering the whole scope of the service for its area.

**Question 18.**—*What is to be the relationship of the environmental services to the curative services provided by the local authorities?*

**Answer.**—The importance of the environmental services is emphasized in pages 10 and 11 of the White Paper, where it is also made clear that responsibility for all these services is not included in the National Health Service organization, which is directed only to the medical and allied care of personal health. Responsibility for the wide variety of environmental services will continue to rest with whatever authorities are most appropriate to carry it in each case.

**Question 19.**—*How is it proposed to associate the general practitioner with work in the hospitals?*

**Answer.**—This is eminently a subject on which the profession's own views will be welcomed, both in planning the service and in subsequently operating it. It is impossible to deal with so important a question in a short answer. The arrangements in each area will rest on the area plan, worked out in consultation with the profession and requiring central approval. This

will be able to provide, as and where appropriate, for suitable "general practitioner" hospitals; but, quite apart from that particular kind of hospital provision, it must be recognized generally that it is in the best interests both of the public and of the medical profession that the general practitioner should have as many and as close contacts with hospitals as possible.

**Question 20.**—*What is to be the relation between general practitioners and medical officers of health?*

**Answer.**—The general practitioner, whether in separate practice or in a health centre, will not be under the direction or supervision of the medical officers of a local authority in the clinical pursuit of his professional work. It is important that he should have every opportunity of keeping in touch with the preventive work of the medical officers of health, and it is the intention that the services of the general practitioner should be used increasingly as time goes on in the performance of functions which have hitherto been mainly the concern of separate whole-time clinics.

**Question 21.**—*Into how many joint board areas is it proposed to divide the country?*

**Answer.**—No proposals as to the actual areas are yet under consideration. These can only be settled after consultation with the organizations and interests concerned.

**Question 22.**—*What is the objection to vocational, including medical, representation on joint health authorities?*

**Question 23.**—*Is it contemplated that joint health authorities should be required to establish committees to which definite functions are referred? If so, is vocational representation on these bodies contemplated?*

**Question 24.**—*Will the Minister give an assurance that voluntary hospitals shall be represented on the joint board authorities?*

**Answer.**—In the White Paper it was recognized that there are arguments for and against including on the local administrative authorities, or on their various committees, a proportion of non-elected members to represent professional organizations and the expert point of view. On balance, it was felt that the risk of impairing the principle of public responsibility lying with the elected representatives of the people outweighed any advantages which were likely to accrue. The Minister will be glad, however, to consider carefully any proposals which the profession has to offer that will not conflict with this principle of democratic responsibility.

**Question 25.**—*What type of experience will be expected of the medical advisers, if any, of the new joint authorities?*

**Answer.**—It is anticipated that the new joint authorities will need—for their varied and important functions—not only full-time officers of high calibre but also part-time advisers in specialist and general practice. In addition they will have the regular advice and guidance of the Local Health Services Councils. It is probably the senior full-time officers that the question has most in view. Recruitment to such posts should clearly not be restricted to any particular group or class of doctor, but should be open to the most suitable person in each case, whatever the source from which he or she is recruited. Experience in medical administration, hospital organization, or public health will obviously be relevant qualifications, and there is scope for further development in training and postgraduate education in these fields.

**Question 26.**—*Will the Minister describe the structure and functions of the local bodies referred to on page 29, paragraph (2)?*

**Answer.**—The profession's own views are wanted before the exact constitution of these bodies can be settled. The intention of the White Paper was that they should perform on the spot the kind of duties at present performed by the Insurance Committees, and thus avoid overburdening the central organization of the Central Medical Board with functions in relation to the general practitioners which experience has shown can be locally discharged.



## Hospital Services

**Question 27.**—*What is the objection to voluntary hospitals being paid in full for the services they render under the scheme?*

**Answer.**—If the whole of the cost of the whole of the public service rendered by the voluntary hospitals—i.e., all their services other than to private paying patients—were paid from public funds, the hospitals would have a less obvious claim to voluntary financial support from the public, and the voluntary hospital movement as it is now known would be endangered. It is neither the wish of the Government to see this happen nor their belief that the public wants it to happen. At the same time, while this principle seems important in the interests of the voluntary hospital movement, the financial arrangements must be such as will ensure that the hospitals can efficiently perform the services asked of them. The exact arrangements needed to ensure this will be fully worked out in consultation with the hospitals' representatives as soon as possible.

**Question 28.**—*Will there be any Exchequer grant for a voluntary hospital in order to enable it to carry out extensions necessary to provide an adequate local service as part of a joint board scheme? Or is such financial assistance to be provided entirely by or through the joint board?*

**Answer.**—This was not dealt with in the White Paper because there had been no preliminary discussions on the point with the hospitals' representatives. It is a point of obvious importance which will be discussed with them as soon as possible.

## Consultant and Specialist Services

**Question 29.**—*Is there to be free choice of consultant by general practitioner? If so, can the consultant be appropriately paid by salary for this part of his work?*

**Answer.**—The intention is that the approved area plan will determine generally the hospitals or groups of hospitals and the specialists to which particular classes of case should be referred within the public service, but within the general arrangements so determined as much free choice as possible will be maintained. It is proposed in the White Paper that the specialists taking part, whole-time or part-time, shall be based for their public service activities on the various hospitals in the way which the plan provides, and they will look to the hospitals concerned for their remuneration; but methods and details of remuneration remain to be discussed.

**Question 30.**—*Will the Minister give an assurance that the personal relationship between general practitioner and consultant shall be preserved?*

**Answer.**—It is the intention that a close personal relationship shall be assured between the general practitioners and the specialists to whom they will refer their patients within the arrangements of the area plan.

**Question 31.**—*What is to be the machinery for the provision of domiciliary consultations? Will the Minister amplify the passage on page 25 of the White Paper: "And—for certain consultants as circumstances may require—of visiting Health Centres and clinics, and, in case of need, the patient's home, at the request of the general practitioner?"*

**Answer.**—It is contemplated that the arrangements of each area plan for providing consultant services should include arrangements whereby consultants will undertake any necessary visiting of patients in their homes at the request of the general practitioner. Which of the available consultants undertake this function will be a matter for local arrangement with the hospitals within the area plan and, of course, with the individual consultants themselves.

**Question 32.**—*Are the details of remuneration for both consultants and specialists to be arranged centrally? On page 25 of the White Paper it is stated that "some central regulation of scales will be required." If all conditions of service for consultants and specialists are not to be arranged centrally what machinery is proposed?*

**Answer.**—No proposals on this have yet been formulated. But it appears likely that standards of remuneration will need to be settled centrally, in consultation with those concerned, and then prescribed for observance by all hospitals within the service.

## General Practitioner Services

**Question 33.**—*Does the Minister agree that the limited compensation proposals set out in the White Paper raise the whole question of compensation for loss of capital value of all general practitioners? What is the attitude of the Minister to this question?*

**Answer.**—Questions of compensation, of the possibility of providing a superannuation system, and of the desirability—and practicability—of discontinuing in future the sale and purchase of practices in the public service, all need to be considered together. The Minister hopes that the profession's representatives will join him in a general discussion of all these issues before the legislative stage arrives, and in this discussion he will particularly welcome the profession's own suggestions.

**Question 34.**—*Why should the Health Centres not be in the same relationship to the joint authorities as the hospitals?*

**Answer.**—The proposed demarcation of functions between the major local authorities acting on their own and the same authorities acting in combination over wider areas is, broadly, that services which belong to the sphere of the hospital, the specialist, and the consultant, and which therefore need to be planned and administered over larger areas, should rest with the combined authorities, while services which do not should rest with the single authorities. On this basis the provision of Health Centres falls into the latter group.

**Question 35.**—*What will be the administrative effect of a Health Centre being attached to a hospital, the hospital being under the joint board, and the Health Centre under the individual local authority, the participating practitioners being also under contract with the Central Medical Board?*

**Answer.**—In practice this situation, where it arises, should not create any serious administrative difficulty. Financial adjustments between authorities which share the same premises for their services have in the past proved perfectly feasible. Whatever the local authority organization, a similar question would arise anyway where a Health Centre was attached to a voluntary hospital. The position of the general practitioner would not seem to be affected by the fact that a particular Health Centre was attached to a hospital.

**Question 36.**—*Will the Minister give an assurance that experiments will be made in Health Centres of varied types and functions under medical guidance before central policy is adopted, and that an experimental centre shall be set up only with the acquiescence and full co-operation of the local profession?*

**Answer.**—It is fully intended to make experiments in Health Centres of varied types and functions in varied kinds of areas, and to do this with the guidance of the medical profession through both the Central and the Local Health Services Councils. As stated in the White Paper, the wish of the local doctors to bring their work into the centres must obviously be a big factor in decisions to provide centres.

**Question 37.**—*Will the Minister give an assurance that experimental Health Centres shall be available to all the practitioners in the area?*

**Answer.**—No assurance can be given that at any particular time there will be enough Health Centres available for all doctors who desire to enter that form of practice. But the desire of doctors to do so, if backed by the success of the Health Centre experiment, would be an important reason for hastening developments in any area. So far as the question may relate only to special diagnostic or similar facilities set up for an area, it will obviously be desirable to make these as widely available as possible to all doctors locally engaged in the public service.

**Question 38.**—Does the principle of free choice and the preservation of the doctor-patient relationship include free choice of patient by doctors working in Health Centres, subject to the limitation of lists? If so, what machinery is proposed to enable a doctor to obtain the transfer of a patient from his list when he feels that the association is no longer beneficial?

**Answer.**—Yes. It is not proposed that doctors in Health Centres should be placed in any worse position in this respect than doctors in public practice outside Health Centres. Details of machinery remain to be discussed.

**Question 39.**—Will the Minister give an assurance that patients will be allowed a reasonable choice of Health Centre if and when established, and that this choice shall not be unnecessarily limited in the case of patients living near the boundary between two local authority areas?

**Answer.**—Yes. Every endeavour will be made to secure this.

**Question 40.**—Why is remuneration by salary considered necessary for practitioners working in Health Centres? In other words, why is competition considered to be incompatible with Health Centre practice?

**Question 41.**—What is meant by salary or "similar" method of remuneration (p. 32)?

**Answer.**—This subject is dealt with on pages 31-2 of the White Paper. The phrase "similar method" is meant to cover any reasonable and practicable method of remuneration which is in accord with the conception of partnership between doctors working together in a Health Centre. A possible example is a small basic salary for all, plus a pooling of the allocatable income of the centre and a sharing among its doctors on an agreed partnership basis. There are other possibilities, no doubt. Suggestions from the profession on this will be welcomed.

#### Maternity Services

**Question 42.**—Will every woman be entitled to the attendance of a doctor of her choice under the service throughout the ante-natal, natal, and post-natal stages of maternity?

**Answer.**—This is one of the questions which the Minister particularly wishes to discuss in more detail with the profession before any proposals can be formulated. The main problems will be to determine the extent to which a woman should have a right to require her family doctor under the new service (or any other doctor) to be present at her actual confinement, how far it should rest only with the midwife to call in the doctor if needed, and in that event whether it should normally be the woman's family doctor who is called in.

#### Medical Officers of Health

**Question 43.**—How is it proposed to compensate a medical officer of health for the loss of the intellectual satisfaction to be derived from the varied work for which he is at present responsible when he becomes a subordinate officer in a larger authority or remains the officer of an authority shorn of the functions which have been his main interest for many years?

**Answer.**—The underlying assumption of this question cannot be accepted. A service of the kind and the scope now proposed will clearly increase, rather than restrict, the field of interest and activity in this branch of professional life.

**Question 44.**—Are the salaries of medical officers of health to be left to voluntary agreement, while the rates of remuneration of general practitioners and perhaps of specialists are wholly or largely settled by central agreement for the whole country?

**Answer.**—This is a matter which must be discussed before the new arrangements are settled. Already there is some element of central standardizing of scales for this branch of the profession, and the review of these scales will need to be considered in any case.

A. V. S. Sarma (*J. Ind. med. Soc.* 1043, 13, 74) records his observations on 25 cases of typhoid fever treated with nicotinic acid, and found that it was devoid of any toxic effect. When used early in the disease it appeared to be particularly beneficial in combating oro-lingual ulceration, excessive salivation, mental symptoms such as confusion and delirium and insomnia, and in reducing length of stay in hospital.

## HEAD INJURIES INVOLVING AIR SINUSES

BY

DONALD MCKENZIE, F.R.C.S.

Major, N.Z.M.C.; Officer in Charge of Base Neurosurgical Unit for Middle East

This paper aims at recording the details and the experience gained of 10 such cases of head injury treated by operation in the neurosurgical unit. Publication of these cases was stimulated by reading a paper on this subject by C. A. Calvert (1942) from the Military Hospital for Head Injuries, and this series lends point to his plea for early operation. Hitherto the tendency has been to adopt an expectant attitude, and, if the rhinorrhoea stops in a few days, as it may easily do, then to do nothing more. In the pre-sulphanilamide days I had the tragic experience of losing such a patient with pneumococcal meningitis in the sixth week, and other cases quoted in the paper referred to show that the danger exists for as many years after injury. In all the cases the anterior fossa was involved, and these observations concern the sinuses of that region and do not include the mastoid sinus.

**Anatomy.**—The regions which are fraught with the danger of a compound fracture into the subarachnoid space are the posterior wall of the frontal sinus, the ethmoid cells, the cribriform plate itself, and the sphenoidal sinus. The dura may be penetrated by a spicule of fractured bone in any situation, but the floor of the anterior fossa lends itself to an additional method of damaging the dura. The bone in the region specified is extremely thin—even of tissue-paper thinness in places—and the closely attached dura is also very thin. When the base of the skull is fractured either by radiation from the vertex or by general distortion, the dura splits easily in this situation. On several occasions one edge of a dural tear has been removed from a linear fissure which has ripped the dura. Hence in the anterior fossa base the thin dura may be penetrated by spicules or split by distortion accompanying a fissured fracture. A distinction must be made between trauma of the ethmoid region and that of the cribriform plate. In the former region the fracture must tear the dura, but, in the latter, rupture of the olfactory nerves alone leaves an open pathway to infection. The sphenoidal sinus is least likely to be involved, as most fractures are anterior to this region.

**Material.**—Four of the 10 cases were battle casualties and 6 were due to blunt injury.

#### Case Histories

**Case 1.**—A cannon-shell splinter penetrated this man's forehead on Nov. 11, 1942, and radiographs showed the track passing via the left frontal sinus, right ethanoids, and right antrum to the right temporal fossa. Rhinorrhoea was noticed a few days after injury, and it persisted irregularly in time and amount. Operation on March 8 (4 months after injury) showed a fistula running through a hole 1 in. by 1/4 in. in the posterior wall of the left frontal sinus and the anterior cribriform plate. Nasal mucosa was visible through the latter. A graft of fascia lata was applied over the opening remaining when the fistulous track was divided. The whole region was powdered with sulphathiazole and the wound closed.

**Case 2.**—This man had lost both eyeballs on March 27, 1943, from a shell splinter. Cerebrospinal fluid was seen to leak from the left nostril on March 30. With jugular compression later, cerebrospinal fluid ran from the right orbit. X-ray report: "Extensive damage to facial bones, left zygoma, left malar, bridge of nose, and fracture of posterior wall of right frontal sinus." Operation on April 12 (16 days after injury) showed a crack of the posterior wall of the right frontal sinus running into the cribriform plate, and C.S.F. gushed out on raising the dura from this crack. A similar vertical crack on the left side ended in a loose piece of bone posteriorly. Dura from both sides of the cribriform plate was stripped back, enabling a large graft of fascia lata to be applied over the whole area after the crista galli had been removed.

**Case 3.**—This soldier was wounded on March 22, 1943, by a mortar splinter in the forehead, which also destroyed the right eye. He had a mild attack of meningitis on April 16; and on May 7 for the first time a severe leakage of C.S.F. was reported, and 5 c.cm. was collected rapidly from the left nostril on that day. X-ray report: "A large right frontal bone defect with many fragments in the orbit, but none in-driven." Later films showed a fine linear fracture running vertically down in the midline and crossing to the left side as it approached the cribriform plate. Operation on May 8 (47 days after injury) revealed a track passing from the right frontal lobe to the open cavity of the frontal sinus. The cribriform plate was intact on both right and left sides. In this case alone the dura was

pened, the adherent tip of the frontal lobe was amputated and a graft of fascia lata applied inside the dura over the opening, and the dural incision was then closed.

**Case 4.**—This man was injured by a mine on Dec. 18, 1942. Brownish rhinorrhoea was observed two days later and continued until Feb. 26, 1943, after which there was never enough C.S.F. to collect, though it was thought to be present. X-ray report: "Extensive damage of the left frontal bone, nasal bones, and left anterior fossa. The fracture passes back in the floor of the left anterior fossa." Encephalography on Feb. 11 showed no abnormality. Operation on June 17 (6 months after injury) revealed two vertical cracks in the left frontal sinus and one crack in the right frontal sinus running down to a large hole in the posterior wall. A tear in the dura opposite the hole on the right side was sutured with black silk, the crista galli was removed, and a flap of temporal fascia was placed over the area.

**Case 5.**—This man crashed on a motor-cycle on May 13, 1943. There was no history of C.S.F. leak. Proptosis was present, and vertical diplopia, due to the depression of the orbital roof and eyeball on the right side to about 1 in. depth. X-ray report: "There is a circular fracture involving the right frontal bone down the midline through the frontal sinus (both anterior and posterior walls affected), across the right cribriform plate and orbital roof out to the temporal fossa, and up towards the vertex to join the fracture of the forehead, completing the circle. There are other secondary fractures, and the orbital roof is a pulped mass depressed into the orbit." On July 13 (2 months later) operation was undertaken to raise the orbital roof and permit the eyeball to be raised, and also to explore the dura. A large hole was found in the posterior wall of the right frontal sinus. The right orbital roof and supraorbital crest were in pieces and were raised to their normal position. A doubtful minute hole in the dura towards the front of the cribriform plate had a small muscle-graft placed over it. Convalescence was uneventful. The left eyeball began to rise steadily in the orbit, the diplopia lessened, and the ophthalmologist advised that no further operation on the eyeball itself was necessary.

**Case 6.**—This man was hit on the nose by the breech-block of an anti-aircraft gun on May 28, 1943, fracturing the nasal bone. C.S.F. rhinorrhoea was reported on the third day and lasted for several days. He developed five recurrent attacks of pneumococcal meningitis, each attack being controlled by sulphadiazine or sulphathiazole, until eventually he was flown to this unit on July 5. He was in coma in two of these attacks, and the pneumococcus was cultured from the C.S.F. on one occasion. He developed another attack on the day after admission. X-ray report: "A fine linear fracture of the posterior wall of the left frontal sinus running back towards the cribriform plate." Operation was undertaken on July 10, this last attack of meningitis settling down in four days. A crack was found on the left side as shown in the x-ray film, running down to the midline and across, to end in a small hole on the right side of the cribriform plate, where mucus could be seen in the nose. The dural tear was increased in stripping the dura back off the cribriform plate. The dural tears were sutured with black silk before placing a large graft of fascia over both sides. He was out of bed on the thirteenth day, but developed a mild meningitis attack next day. This cleared up rapidly with sulphadiazine therapy, and there were no further complications. He was quite well when seen in late November.

**Case 7.**—This man sustained a motor-cycle crash on June 1, 1943, and was operated upon at once in another hospital. Spicules of bone were picked out of the dura, and C.S.F. leak was reported for three days after operation. X-ray report: "A long linear gap in the left frontal bone—the frontal sinus opened and several fragments of bone are situated behind the gap, but not necessarily intracranial in position." Operation on July 12 (6 weeks after injury) revealed a hole in the posterior wall of the left frontal sinus. On this side a protruding bone fragment 3 by 1.5 cm. was drawn out from a dural perforation. A crack was found on the right side anterior to the cribriform plate, with adherent dura. On removing this dura C.S.F. ran out. The dural holes were sutured and a graft of temporal fascia applied over the whole area.

**Case 8.**—This man was injured in an aeroplane crash in 1943. Two lacerations in the forehead had been sutured, but they were infected and both eyes were closed by oedema. A constant discharge of brownish C.S.F. came from the left nostril. Spinal puncture revealed deeply blood-stained fluid. X-ray report: "There is a depressed fracture of the right frontal bone into the frontal sinus with comminution of the orbital roof and ethmoids. A fracture can be traced down through the ethmoids into the maxilla." Operation performed 2 days later revealed a loose piece of bone in the posterior wall of the right frontal sinus continuous with the crista galli, which was also fractured. The crista galli and attached sinus wall were removed. There was a small dural tear opposite the crista, and the right orbital plate and ethmoid roof were cracked in many places. A temporal fascia graft was applied over the small dural tear. The supraorbital crest was raised into position and the

depressed frontal bone was also elevated. Convalescence was uneventful.

**Case 9.**—This officer crashed on a motor-cycle on Aug. 13, 1943, and it is probable that the wheel of the oncoming truck went over his head. He reports that C.S.F. leaked from the nose on the second day and continued for several days. There was a right sphenoidal fissure syndrome—i.e., partial loss of the first to sixth cranial nerves. X-ray report: "A gross 'block' fracture of the facial bones—the upper limit passing through both fronto-malar areas and roof of the nose to both sides of the cranium, and the lower limit passing through the body of the maxilla, involving both antra." Operation on Aug. 27 (14 days later) explored both sides of the anterior fossa back to the transverse fissured fracture, which was just anterior to both sphenoidal crests. A subsidiary crack into the right ethmoid region was found, with a dural tear in apposition. The optic foramen was laid open and the sphenoidal crest was also removed to leave the optic nerve theca and the sphenoidal fissure exposed. There was a small tear in the optic nerve theca, through which a normal optic nerve could be seen; no blood-clot was present. A graft of fascia lata was applied over the dural tears. Post-operatively he was thought to be developing a frontal lobe abscess, but the appearance of paraesthesia, sensory changes, and muscle weakness in the palate, neck, and limb muscles established a diagnosis of peripheral neuritis. He was seen in December, when the loss of the lower half of the right field of vision was the only remaining sign of the previous paralysis of the first six cranial nerves on the right side. There was still some weakness in the left leg muscles.

**Case 10.**—This man was injured on Aug. 27, 1943, in a car smash, and there were compound fractures of a forearm and a leg in addition to the severe head injury. C.S.F. rhinorrhoea was free from the right nostril for five days, and irregularly after that. X-ray report: "There is a depressed fracture of the fronto-nasal region, with extensions on both sides to the ethmoid plate. The frontal sinuses are involved in the fracture." Operation on Sept. 13 (17 days later) revealed a loose piece of bone in the posterior wall of the left frontal sinus attached to the fractured crista galli. There was a small dural tear on both sides of the crista due to penetration of spicules. The dura was cleared well back on the cribriform plate to enable these holes to be pursestrung with silk, and a graft of fascia lata was superimposed.

### Diagnosis

C.S.F. rhinorrhoea and intracranial aerocele are two indubitable signs that the dura has been torn and that meningitis may be imminent. Aerocele did not occur in any of the 10 cases, but its presence demands investigation and operative repair of the dural injury.

**C.S.F. Rhinorrhoea.**—In this series the discharge was slight, lasting two days in three cases, three days in two cases, and irregularly for weeks in three cases; in only one case was there a profuse discharge, whereby 5 c.cm. of fluid was collected easily on the 46th day. In five cases the onset was delayed several days, presumably until the shrinkage of obstructing blood-clots permitted the fluid to escape. In the one case with profuse rhinorrhoea the discharge did not appear until the 46th day. In the first few days after injury the C.S.F. may be deeply blood-stained from associated cerebral laceration, and any early nasal bleeding should be given careful consideration. Case 6 showed blood-stained fluid, and Cases 4 and 8 a brownish discharge. Localization of the fracture to the same side as the rhinorrhoea has proved to be quite unreliable unless taken in conjunction with the homolateral anosmia and corroborative x-ray findings. Cases 2, 3, and 8 showed left rhinorrhoea, but the dural tear was right-sided; and Case 10, with right rhinorrhoea, had bilateral dural tears. Nasal mucus, or tears, may cause doubt when the amount of fluid is scanty; but jugular compression will usually increase the flow, and the presence of sugar will establish the nature of the fluid.

**Anosmia.**—Though not an outstanding symptom, anosmia is valuable evidence of local injury where it can be established that there has been an alteration in the sensation of smell following the injury. The patient may be too comatose to examine or to give his pre-traumatic condition. Also, one or both nostrils may be blocked by swelling. In our cases the man's statement about his previous sense of smell was accepted. Three cases had no sense of smell on either side; two had a slight degree of smell on one or both sides; four had anosmia on the appropriate side; and the one case with no dural tear had normal sensation.

**Radiography.**—The recognition of a fracture in the floor of the anterior fossa may be an extremely difficult matter. In Case 6 a faint vertical crack was visible in the posterior wall of the sinus, but it could only be surmised that it continued back into the cribriform plate. At operation it was demonstrated that it had crossed the midline and ended in a hole on the opposite side. Case 5 was described as a circular fracture, but it was also surmised that the fracture crossed the orbital and cribriform plates, whereas it could be easily traced up from the temporal fossa across the forehead and down through the frontal sinus. Our procedure was to take stereo-

scopic antero-posterior and lateral views and then, if necessary, oblique views. Posterior fractures involving the anterior clinoid process may be elucidated by taking an axial view of the optic foramen where the outer boundary is formed by the anterior clinoid process. Cases 9 and 10 were of the type described as a "block" fracture. The central naso-frontal block of bone was detached by two lateral fissures through the ethmoids in the one case and through the temporal and frontal bones in the other.

**Spinal Puncture.**—I believe that all patients with a head injury should have a spinal puncture. In the case of these anterior fossa fractures, examination of the spinal fluid may give warning of meningitis, and also it will check the presence of blood if there has been any doubtful nose-bleeding.

**Meningitis.**—Meningitis itself may confirm the diagnosis. Case 6 showed no fracture in the original films, but the history of five recurrent attacks of pneumococcal meningitis was accepted as confirmation of a dural tear, and a stereoscopic film revealed a hairline crack in the frontal sinus. Case 3 developed mild meningitis—headache, neck rigidity, pyrexia, and 10 cells per c.mm.—on the 25th day after injury. This was controlled in a few days by sulphadiazine therapy. On the 46th day he complained of a "running cold in the head," and was observed to have a profuse C.S.F. rhinorrhoea. It may be mentioned, by the way, that, though frank meningitis is diagnosed clinically by delirium, pyrexia, neck rigidity, and spinal fluid containing several thousand cells per c.mm., I cannot remember a case in which an organism could be recovered from the spinal fluid after sulphadiazine therapy had been instituted.

### Treatment

All of these 10 cases were seen some time after their original injury, when they were co-operative and could be investigated fully. There should be no urgency in operating on a recently injured head case until the patient has recovered from the cerebral trauma; and, in fact, judged by this series, the diagnosis of a torn dura would not be made for several days or weeks.

**Preliminary Treatment.**—All cases received prophylactic sulphadiazine—preferably by mouth, but intravenously if necessary. The dosage was 6 g. daily, but if meningitis was present this was increased to 12 g. daily and an initial 6 g. given intravenously. Blood transfusion was rarely necessary, as the operation does not produce shock and was usually completed in two hours.

**Anaesthesia.**—This was essentially local infiltration of 0.5% novocain solution after a preliminary hyoscine and morphine injection, which was supplemented by intravenous pentothal drip when necessary. Our procedure was to set up an intravenous saline drip apparatus at the start, and then either blood or pentothal could be rapidly substituted.

**Operative Technique.**—A coronal incision within the hair line was used in most cases, turning the forehead flap down to expose both supraorbital ridges. In one case only a linear midline scar already present was incised to turn a unilateral flap, but the cosmetic effect of the coronal flap is well worth achieving at the expense of a bigger incision. The bone flap was unilateral or bilateral, dependent on our confidence in the localization of the dural injury. In either case it was hinged on the temporal muscle, and was made with four burr-holes for the unilateral flap and six burr-holes if bilateral. The lower midline burr-hole was placed as low as possible after studying the size of the frontal sinus. Five cases had bilateral bone flaps, and in only one case was there any bleeding from the longitudinal sinus. The dura was stripped up off the orbital plate both medially towards the cribriform plate and posteriorly towards the sphenoidal crest. Any fracture was easily seen, and the dural tear or escape of C.S.F. was looked for on the opposing dural surface. The opposite side was explored similarly. The more difficult case was the fracture of the crista galli or cribriform plate, where, to get at the dural tear adequately, the dura had to be stripped out of the elcft beside the crista galli—a very difficult procedure. The dura could then be stripped back easily to the sella turcica region if necessary. This complete elevation on both sides was necessary in only two cases (Case 6 and Case 10). It allowed the dural holes to be pursestrung with fine silk, and gave a very good exposure, but is best avoided if any smell sensation is still present. Our procedure was then to powder the dura with sulphathiazole, apply a fascial graft over the area like a postage stamp, and seal an edge with diathermy. The crista galli was nibbled away before applying a midline graft, which would be distorted by its presence. Fascia lata was employed in six cases in which a good solid graft was indicated. Temporal muscle fascia was used in three cases, but it is thin and no great area can be covered. A muscle-graft was used in Case 5, where there was a minute and dubious hole. The graft was applied extradurally except in Case 3, in which the dura was opened widely to permit removal of the adherent anterior lobe. In this case it was much easier to apply the graft intradurally. It is reasonable to suppose that some other cases could be grafted more simply by working intradurally and avoiding a wide elevation of the dura. But the dural tears are small, and are best located by finding

the fracture and then seeing the hole or the escaping C.S.F. in the region. I do not think these small dural tears could be located well intradurally, and also there is an advantage in avoiding trauma from direct handling of the cerebral lobes.

All bleeding was stopped by diathermy to the dural veins wax to the bone. It is much more important to have the dural bleeding completely stopped in these low-pressure cases than in tumour operation, in which the raised pressure will stop any extradural oozing. The whole dura was then powdered and the flap and scalp sutured in place in the usual way. Bone chips were employed to fill up the frontal burr-holes.

**After-treatment.**—No special complication arose. Both eyes were usually closed by frontal oedema for one or two days. Sulphadiazine therapy was continued for five days after operation with the routine dosage of 6 g. daily. These patients had little pain, and some wished to be allowed up on the third day, though this was not permitted until the tenth day. When revisiting the unit on Nov. 12 all patients had been discharged and were understood to be well.

Those patients with complete anosmia did not appear to mind their disability. They could not detect any testing materials in the mouth or nose, though taste was unimpaired. One patient (Case 7) had a constant subjective sensation which he described as a "disinfectant" smell.

### Conclusions

The following are the conclusions arrived at: (1) That the dangers associated with C.S.F. rhinorrhoea need stressing to medical officers. (2) That unless the possibility of dural tearing is kept in mind, the rhinorrhoea, anosmia, and radiological evidence of fracture may be easily overlooked. (3) That every head injury with C.S.F. rhinorrhoea, however slight, should undergo operative repair of the dura rather than risk the vagaries of natural repair. (4) That with the technique used the operation is neither formidable nor dangerous; there were no deaths and no complications in this series.

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### REFERENCE

Calvert, C. A. (1942). *J. Laryng. Otol.*, 57, 499.

## USE OF CRUDE PENICILLIUM FILTRATE FOR LOCAL TREATMENT

BY

J. M. ALSTON, M.B., M.R.C.P.Ed.  
(Archway Hospital, London)

The therapeutic value of partially purified penicillin has been established in this country (Florey and Florey, 1943; Fleming, 1943; Report to War Office, 1943; Christie and Garrod, and others, 1944) and in the United States (Keefer et al., 1943), but the use of untreated filtrate of cultures of *Penicillium notatum* has been very little noticed, although successful results have been obtained with gauze impregnated with the living mould (Hobson and Galloway, 1944):

This communication gives the results of the local use of the untreated filtrate in 24 patients. The strain of *P. notatum* was kindly given by Prof. Fleming, and in growing it for this purpose the medium has been changed from time to time but has always been a modification of the Czapek-Dox formula. At present it is made according to that of Challinor and MacNaughtan (1943) without the yeast extract which they recommend and with the addition of calcium carbonate. The following constituents are dissolved in a litre of distilled water:

Sodium nitrate (NaNO <sub>3</sub> )	.. .. .	3.0	gramme
Potassium chloride (KCl)	.. .. .	0.5	"
Magnesium sulphate (MgSO <sub>4</sub> , 7H <sub>2</sub> O)	.. .. .	0.5	"
Ferrous sulphate (FeSO <sub>4</sub> , 7H <sub>2</sub> O)	.. .. .	0.01	"
Potassium dihydrogen phosphate (KH <sub>2</sub> PO <sub>4</sub> )	.. .. .	6.5	"
Disodium hydrogen phosphate (Na <sub>2</sub> HPO <sub>4</sub> , 12H <sub>2</sub> O)	.. .. .	33.5	"
Glucose (pure B.D.H. anhydrous or "Climax" brand, Corn Products Ltd.)	.. .. .	40.0	"
Distilled water to 1,000 c.cm.			

Sterilize in free steam for 1½ hours in 200-c.cm. amounts in 1-litre conical flasks. Add 5 c.cm. of 10% solution of sterile calcium carbonate to every 200 c.cm. of medium before inoculating. The final pH is about 7.

The medium should form a depth of not more than 1.5 to 2 cm. in order to expose to air a large surface relative to the volume. Incubation is at a temperature of 24°C. for 8 to 10 days. When the flasks have not been shaken the mould forms a thick firm pellicle and the culture medium below is almost as clear as before incubation. The fluid medium, after growth, is passed through a Seitz filter, and is tested to make sure that the reaction is nearly neutral and that less than 0.1% glucose is left.

The assay of the product is made by comparing its action on the Oxford strain of staphylococcus with the action of a standard specimen of calcium salt of penicillin. The method mostly used is the established one of measuring the zone of inhibition of the staphylococcus around a piece of porcelain tube (containing the penicillin) set on a heavily inoculated plate of agar medium, and, occasionally for check, the assay is made by inhibition of the growth of the coccus in broth produced by serial dilutions of the standard preparation and the unknown filtrate (M.R.C. War Memorandum No. 12). The filtrates used for treatment varied in strength from 4 to 10 units per c.c.m.; they do not lose strength when kept at 4°C. for seven days nor when heated to 65°C. for 24 hours. More details of the methods used for production and assay are described in a paper by R. M. Sandercott, which is expected to appear in the *Bulletin of the Institute of Medical Laboratory Technology* in July of this year.

Specimens of pus, etc., from patients for whom penicillin treatment was desired have in most cases been cultured bacteriologically, and the most important pathogens (usually staphylococcus or haemolytic streptococcus) tested for sensitivity to penicillin.

The filtrate is applied to superficial lesions by gauze soaked in it, by a cream (made of lanette wax 4%, liquid paraffin 25%, paraffin wax 3%, and filtrate 68%) or by portions of the recently grown mould after the fluid medium had been drained away from it. Cavities in bone which are accessible to the surface are packed lightly with gauze soaked in the filtrate and sealed (if surrounding surfaces are suitable) with sheets of "cellophane" fixed by elastoplast. Deep sinuses in muscle and subcutaneous tissues are treated with indwelling catheters, which are carefully shortened as the sinuses heal from the bottom. Cavities and sinuses are washed out with saline before fresh filtrate is left in them. Treatments are carried out at first twice a day and usually, after a few days, once daily and then less frequently. In dealing with large wounds with sinuses the number of dressings is reduced to a minimum.

In general, when the treatment is successful it produces the same results as solutions of the calcium salt of the drug used locally. These are reduction in suppuration, increase of healthy granulation tissue and epithelium, decrease of pain in the lesion under treatment, and a rapid improvement in general well-being. Patients state that the filtrate stings to a moderate or, with a few batches, a severe degree when it is applied to a raw surface, but as a greater compensation it quickly reduces the tense throbbing pain and the burning sensation of the inflamed tissues from which many of them have suffered almost continuously for months or years. Experience has also confirmed that the drug is not a substitute for surgery but a very powerful ally to it, and in a complicated case repeated surgical measures may be needed to bring the benefits which they themselves are known to produce and to allow the penicillin the direct access to bacteria which it requires. In some cases of acute or chronic osteomyelitis, sequestrectomy may be needed after the filtrate has reduced the toxæmia and the inflammation of the soft tissues, but the benefit to the patient is still undoubted. Brief reports are given of all patients treated so far, with the exception of some very minor infections and some patients in whom treatment has been too recently begun for comment. The names of the surgeons who were in charge of the patients and who kindly supplied the notes are given in parentheses.

#### Case Histories

**Case 1.**—Male, 28 years. Chronic osteomyelitis of sacrum. Multiple sinuses. Injured in Germany, April, 1942. Admitted Feb. 22, 1944, with multiple intercommunicating sinuses. No

material change until instillation of penicillium filtrate started on March 13 and continued daily for 3 weeks and subsequently at shorter intervals. Marked improvement in general condition; diminution of discharge and of haemolytic streptococci. Hip mobility restored. Total penicillin, 1,500 units. (Mr. E. T. Bailey.)

**Case 2.**—Male, 25 years. Compound fracture of right femur and shell wound. Wounded Jan. 5, 1943. Admitted to Northern Hospital July 8, 1943. Plaster was applied in Tobruk four months previously. No material improvement after 3 months' sulphonamide treatment, blood transfusions, etc., until on Jan. 14, 1944, penicillium filtrate was instilled once daily for 8 days. Effect was progressive reduction in amount of discharge and of haemolytic streptococci, followed by gradual healing of 10-inch thigh wound and establishment of bony union. Total penicillin, 1,000 units. (Mr. E. T. Bailey.)

**Case 3.**—Male, 17 years. Staphylococcal osteomyelitis of tibia and abscess of thigh. Admitted June 30, 1943, for possible tuberculosis of right hip. Developed abscess of thigh Aug. 10 and acute osteomyelitis in upper tibial epiphysis six weeks later. Tibial cavity drained and daily instillation of penicillium filtrate begun Oct. 18, continued for one week, and repeated for another week a fortnight later. Progressive and rapid decrease of discharge and of *Staph. aureus* and haemolytic streptococcus; closure of cavity and restoration of normal x-ray appearance. Effect on abscess of thigh similarly treated: almost immediate response of previously intractable inflammation, with healing in four weeks. Total penicillin, 800 units. (Mr. E. T. Bailey.)

**Case 4.**—Through-and-through war wound above knee; recent sequestrectomy. 500 units instilled during week resulted in almost total healing in a month, comparing most favourably with cases without penicillin. (Mr. E. T. Bailey.)

**Case 5.**—Male, 8 years. Subacute osteomyelitis of tibia for 2 months. 300 units during 10 days caused rapid reduction of profuse pus and the granulation of 2 sinuses, with much improvement of general health. The penicillium filtrate treatment was started immediately after second operation. (Dr D. Kaye.)

**Case 6.**—Male, 21 years. Profuse suppuration for 3 weeks of finger with compound fracture of phalanx. 100 units during a week produced in that time a clean wound with healthy granulations. (Mr. R. A. V. Lewys-Lloyd.)

**Case 7.**—Male, elderly. Chronic osteomyelitis of tibia. Two sinuses were treated during 8 to 10 days with 140 units; one was practically healed and one quite healed and dry. In comparison, a third sinus was unchanged while treated with acriflavine in the same period; this sinus is now responding to penicillin. (Mr. R. A. V. Lewys-Lloyd.)

**Case 8.**—Female, 13 years. Sinus discharging for months following perinephritic abscess and nephrectomy. 500 units during 3 weeks caused cessation of discharge, much reduction in size of sinus, and general improvement in health. (Dr G. M. Palmer.)

**Case 9.**—Male, adult. Deep infected wound of palm 2½ in. by 1 in., of two months' duration; healing ceased. 30 units and mycelium during a week caused healthy granulation all over and rapid epithelization. (Mr. E. E. Bourke.)

**Case 10.**—Female, 46 years. Two syphilitic ulcers of leg, stationary for 5 years despite constant treatment. 300 units during a month greatly reduced swelling and pain of leg and reduced ulcers to less than half the area. Treatment is being continued. (Miss G. M. Sandes.)

**Case 11.**—Female, 45 years. X-ray burn and ulcer of big toe, lasting 6 years, with very slow improvement under treatment. Rapid improvement started by 2 weeks' treatment with calcium penicillin and continued to almost complete healing with 500 units of filtrate given during 5 weeks. (Miss G. M. Sandes.)

**Cases 12, 13, and 14.**—Three female children with gonococcal vulvovaginitis for 3½, 9, and 14 months, resistant to sulphadiazine (2) or sulphapyridine. 40 units each during 4 days resulted in cure, observed for four months. Filtrate retained in vagina by elevation of pelvis for half an hour after daily instillation. (Miss G. M. Sandes.)

**Case 15.**—Female, 32 years. Abscess in superficial tissues of abdominal wall associated with widespread surrounding erythema and rheumatic pains, lasting for 6 weeks after appendectomy. During 12 days 240 units produced cessation of suppuration and progressive healing of wound. (Miss G. M. Sandes.)

**Case 16.**—Female, adult. Operation wound for frontal sinusitis, indolent for two months, with inflammation of surrounding skin. 100 units followed by healthy granulation of wound and subsidence of skin infection. (Mr. Bedford Russell.)

\* Patients 1, 2, and 3 were demonstrated by Mr. Bailey and me at a meeting of the Clinical Section, R.S.M., on April 14, 1944.



**Case 17.**—Female, 38 years. Abscess and sinuses of abdominal wall for 12 months. 600 units during 7 weeks, with sulphapyridine powder during part of time, almost ended profuse suppuration, closed sinuses and gape of wound, and improved general condition. (Mr. I. Price.)

**Case 18.**—Female, adult. Large breast abscess with much swelling of surrounding breast; incised and one pint of pus removed. 200 units of penicillium filtrate instilled twice a day during five days reduced discharge to a little sero-pus and brought surrounding tissues to normal. (Dr. G. M. Palser.)

**Case 19.**—Female, 65 years. Cellulitis and suppuration in resutured abdominal operation wound. Local treatment by sulphacetamide (albucid) and by eusol produced very slow progress during two months; 150 units during 5 days ended suppuration, reduced sinuses and gape of wound, and produced healing edge all round. (Mr. W. T. Kenny.)

**Case 20.**—Female, 17 years. Two abscesses in right breast. The larger, after incision, treated with 300 units during 3 weeks, healed well in spite of a near-by pocket requiring another incision. This illustrated need for close contact of penicillin with the suppurating lesion, and the result was considered only moderately successful. (Dr. G. M. Palser.)

**Case 21.**—Male, adult. Osteomyelitis of tibia greatly improved in healthy granulation by 170 units; unopened abscess produced septicaemia, successfully treated by sulphathiazole. Rapid healing of sinuses and abscess then resumed. Septicaemia recurred. Systemic administration of penicillin needed. (Mr. E. T. Bailey.)

**Case 22.**—Female, 40 years. Acute breast abscess. After incision, 200 units in 9 days, followed by healing not more rapid than normal. (Dr. G. M. Palser.)

**Case 23.**—Female, 10 months. Subacute suppurative cellulitis of temporal region and brain abscess (probably due to *B. necrophorus*). Profuse suppuration in muscles of temporal and pterygoid regions subsided to oedema after 80 units during one week, but pus had rapidly decreased previously without penicillin. Necrosis of mastoid cells found at operation, and child died same day. At necropsy a well-encapsulated abscess in temporal lobe of brain without apparent connexion with surface; no suppuration in tissues outside skull. Effect of filtrate doubtful. (Mr. McCrea.)

**Case 24.**—Male, elderly. Chronic osteomyelitis and sinus of thigh. Very little improvement with 280 units of filtrate in a week followed by 250 units of calcium salt, although *Staph. aureus* isolated was quite sensitive to penicillin. (Mr. E. T. Bailey.)

### Comment

It is considered that in the first 19 of these patients the filtrate has been successful, sometimes to a quite unexpected degree; in the other 5 success was partial, doubtful, or absent. It is claimed, however, that this series shows that the effects expected of penicillin can be obtained by the unconcentrated filtrate when it can be applied locally to tissues infected with bacteria sensitive to it.

Since the filtrate can be readily produced and assayed in a bacteriological laboratory which has a well-trained staff, it can be used for local application to acute and chronic abscesses, sinuses, and ulcers as a substitute for the partially purified substance until the latter is available. Since the filtrate retains its potency at 4° C. for at least a week, it is possible to provide a steady supply by the production of one or two batches weekly.

A specimen was dried in several portions on April 25, 1944, in Major J. E. McCartney's laboratory by Mr. A. G. Rayner by the method which he recently described (A. G. Rayner, 1943), and when the dried substance is dissolved in sterile water some portions have retained full potency for 8 days, but others are found to have lost it entirely immediately after drying. This irregularity is being investigated.

It has been found in this series, as it has been by other observers, that, in the course of treatment of external lesions by penicillin, *B. pyocyaneus* becomes prominent and may hinder healing after the penicillin-sensitive bacteria have been reduced or banished. I have confirmed, by sensitivity tests similar to those used for assay of penicillin, that *B. pyocyaneus* (4 strains) is quite sensitive to saturated solutions (4%) of boric acid; and Dr. G. M. Palser has found in three patients that the boric acid solution reduced the suppuration due to *B. pyocyaneus* and permitted continuation of healing, although the organism recurred when boric acid was stopped before healing was complete. This seems worth further trial.

### Summary

Crude penicillium filtrate containing 4 to 10 units of penicillin per c.cm. may be used successfully for treating many acute and chronic inflammations by local application, in place of the partially purified calcium salt of penicillin: the filtrate can be dependably produced and assayed in a bacteriological laboratory in useful quantities.

I wish to express thanks to the surgeons for their co-operation, to Drs. A. Martin and C. H. Carrington and others of Imperial Chemical (Pharmaceuticals) Ltd., for imparting much of their experience; to Dr. J. H. Waelsch and Mr. E. Martin for helpful suggestions; and especially to Mr. R. M. Sandercott for his enthusiasm in developing and carrying out the technical work.

### REFERENCES

- Challinor, S. W., and MacNaughtan, J. (1943). *J. Path. Bact.*, **55**, 441.  
Christie, R. V., and Garrod, L. P.; and others (1944). *British Medical Journal*, **1**, 513-528.  
Fleming, A. (1943). *Lancet*, **2**, 434.  
Florey, M. E., and Florey, H. W. (1943). *Ibid.*, **1**, 387.  
Hobson, A. J., and Galloway, L. D. (1944). *Ibid.*, **1**, 164, 230.  
Keefer, C. S., and others (1943). *J. Amer. med. Ass.*, **122**, 1217.  
M.R.C. War Memorandum No. 12 (1944). *Use of Penicillin in War Wounds*, p. 12, H.M.S.O., London.  
Rayner, A. G. (1943). *J. Path. Bact.*, **55**, 373.  
Report to War Office and M.R.C. on Use of Penicillin in War Wounds, 1943.

## AUTOLYSED YEAST IN THE TREATMENT OF NUTRITIONAL MACROCYTIC ANAEMIA

BY

G. R. SIPPE, M.B., B.S.

(From the Bacteriological Laboratory, Reduit, Mauritius)

Nutritional macrocytic anaemia has been reported from India, China, Africa, and Macedonia, and there is strong evidence that it is a deficiency disease due to the absence of one or more essential vitamin-like factors in the diet. It will therefore tend to occur in communities where, for economic or other reasons, foodstuffs containing adequate supplies of these factors do not normally form part of the diet. Thus in the poverty-stricken areas of Macedonia, Fairley *et al.* (1938) found the condition to be common among refugee peasants, and Wills (1934) stated that it was especially rife in Southern India, where rice is the staple food. In Mauritius it is particularly common among those members of the community who, for religious reasons, do not include beef flesh in their diet. The condition is found in both sexes, and is most prevalent during the second and third decades. It is especially apt to appear during the latter half of pregnancy, and it is probable that in cases of malarial splenomegaly the disease is aggravated by excessive destruction of normal and abnormal erythrocytes by the hypertrophied reticulo-endothelial system (Fairley *et al.*, 1938; Hughes and Shrivastava, 1931).

Although it is agreed that nutritional macrocytic anaemia is a deficiency disease, the part played by the factor or factors whose absence is responsible for the condition is obscure. Autolysed yeast (marmite) (Wills, 1934) and crude liver extracts both produce a maximal reticulocyte response, and Wills found that the factor or factors were water-soluble, heat-stable in an acid medium, and partially resistant to autoclaving in an alkaline medium; and Formijne (1940) has shown that potent substances can be obtained by extraction of beef flesh with 70 to 80% alcohol, but that the potency is lost in concentrations of 90% alcohol.

Wills *et al.* (1937), in the course of experiments on rhesus monkeys suffering from an artificially induced anaemia which was considered to be the counterpart of nutritional macrocytic anaemia in man, found anahaemin to be ineffective. This was surprising in view of its efficacy in cases of Addison's pernicious anaemia. Trials with anahaemin in nutritional macrocytic anaemia in man have given variable results. Wills and Evans (1938) considered it to be ineffective, and Napier *et al.* (1938) stated that some cases responded well while others failed to show any response. Fairley (1940) found very large doses to be effective in an Indian suffering from the condition.

Wills *et al.* (1937), in further experiments with campolon, which was fractionated into soluble and insoluble portions by saturation with ammonium sulphate, found that the insoluble

portion (containing the major part of the anahaemin) was very potent in cases of pernicious anaemia and inactive in monkey anaemia, and that the soluble portion was active in both conditions. It is suggested that the potency of the soluble fraction may be due to some of the anahaemin in the crude extract not being precipitated, or to a new substance not precipitated by the ammonium sulphate.

It is possible that there are two essential factors in the diet (Wills *et al.*, 1937): one which reacts with the intrinsic factor to form the liver principle, and the other—also found in the crude liver extract and not precipitated by saturation with ammonium sulphate—which is necessary for the activity of the pure liver extracts. Probably the commonest source of these factors in the average diet is beef flesh, and it has been shown that autolysed yeast (marmite) is extremely potent in the condition under discussion. Watery yeast extract and dried yeast powder (Wills, 1934) are inactive.

In treating nutritional macrocytic anaemia, the reasons for the non-consumption of foodstuffs containing adequate quantities of the necessary factors—namely, economic hardship and racial and religious prejudice—must be closely borne in mind, and it must be remembered that the condition will relapse unless means are adopted for the continuous supply of the essential foodstuffs. Autolysed yeast would appear to be the ideal substance, as not only is it rich in the necessary factors and acceptable to all communities, but, on account of its cheapness, can readily be made available to all sections of the public. Autolysed yeast is also rich in certain members of the vitamin B complex, and in Mauritius has proved valuable in the treatment of pellagrous dermatitis and angular stomatitis and glossitis (Dr. André), two conditions which by virtue of the poor diet tend to occur in regions where nutritional macrocytic anaemia is found.

A number of cases of nutritional macrocytic anaemia have been treated with yeast obtained locally as a waste product in the manufacture of alcohol by fermentation of molasses. The yeast mixture is obtained from the bottom of the vat after fermentation has ceased and the top fluid has been run off. Normally this sediment is discharged on to the fields, where on account of its nitrogen content it has some value as a fertilizer. The sediment (yeast mixture) has the consistency of thin gruel and is brownish in colour. The taste is not pleasant, but when given with water and a little sugar the mixture is more palatable.

At present work is proceeding in an attempt to render the mixture more agreeable to the taste and to obtain it in a more concentrated form, since patients very occasionally are unable to take it on account of the vomiting and diarrhoea it may produce. This intestinal upset is probably due to the taste and acidity of the mixture, which has to be taken in comparatively large amounts, and to the insoluble material present in the residue. It is hoped that preliminary washing associated with some form of evaporation in pans, similar to that employed in the preparation of salt, may prove satisfactory.

Before use it is advisable to pass the mixture through a coarse filter, such as cheese-cloth or a fine screen. Afterwards it is sterilized at 70° C. for one hour, which not only kills any pathogenic organisms that may be present but also the yeast cells themselves, and autolysis is thus hastened. It is probable that liberation of the potent factor or factors occurs only after autolysis has taken place. In these experiments amounts of yeast sufficient for two to three weeks' treatment were prepared at one time and administration was started immediately after sterilization. No work has yet been done to ascertain whether prolonged keeping will increase the potency of the preparation. The quantity of the mixture necessary to produce a satisfactory blood response has been found to be from 3 to 6 oz. a day. In pregnancy, especially during the latter half, the bone marrow may fail to react even with very large doses, and this unsatisfactory feature has been noted by Davidson *et al.* (1942). It may be due partly to increased demands by the foetus for the liver principle and a temporary inhibition of the bone marrow during pregnancy, and partly to the absence of some essential factor in the diet.

Samples of yeast mixture from two separate distilleries (Nos. 1 and 2) were analysed, with the following results:

TABLE I.—Average Composition of Yeast Liquor

Liquor No.	Solids	Protein	Yeast (approx.)	Calcium	Phosphorus Pentoxide	Iron	Calcium Sulphate	Ash	Density
1	26.6	2.0	4.0	4.5	0.16	0.024	9.2	16.5	1150
2	15.6	4.0	8.0	0.6	0.23	0.040	—	3.0	1060

TABLE II.—Average Composition of Solids from Yeast Mixture

Liquor No. (% Solids)	Protein	Yeast (approx.)	Calcium	Phosphorus Pentoxide	Iron	Calcium Sulphate	Ash
1 (26.6)	6.74	13	18.4	0.85	0.09	32.0	57.20
2 (15.6)	27.38	54	3.9	1.50	0.27	—	19.25

In distillery No. 1 the molasses used for fermentation were obtained from a sugar factory producing white (bleached) sugar, and in No. 2 the molasses were from a factory producing raw (unbleached) sugar. The large amounts of inert calcium sulphate present in the sample from distillery No. 1 result from the bleaching process, and therefore are not found in the sample from the second distillery. In the experiments to date the yeast has been obtained solely from distillery No. 1, but it is proposed in future to use the mixture from distilleries of the second type in view of the much larger quantities of yeast present in the sediment.

The following are details of cases treated with this yeast sediment. Owing to the isolation of the laboratory from the hospitals, a full blood examination was not always possible, nor was a daily reticulocyte count practicable. All cases showed definite hyperchromia and marked macrocytosis and anisocytosis. In Cases 1, 3, 5, and 6 gastric analysis was carried out after the yeast treatment; in Case 4 it was done before treatment. Free acid was found in all. Patient No. 2 was unable to swallow the tube even after treatment had finished.

Case 1.—A male Moslem aged 43 had been for four months complaining of weakness, dyspnoea, and palpitations. When seen he was weak, and pallor of the tongue and conjunctiva was extreme. The spleen was not palpable. The blood findings were: R.B.C., 760,000 per c.mm.; Hb, 2.94 g. (Sahli); W.B.C., 4,500 per c.mm.; mean corpuscular haemoglobin, 38.7  $\gamma$ . A few trichuris eggs only were found in the stools, and the urine was normal. Yeast, 6 oz. a day, was ordered, but by mistake the patient actually took 8 oz. a day. After two weeks he began to improve rapidly, and eight weeks after starting treatment the blood findings were: R.B.C., 4,050,000 per c.mm.; Hb, 11.9 g. (Sahli); W.B.C., 7,200 per c.mm.; M.C.H. 29.7  $\gamma$ .

Case 2.—A male Hindoo aged 21 had complained of weakness, palpitations, and dyspnoea on exertion for the last three years. He was pale and weak when seen. The blood findings were: R.B.C., 720,000 per c.mm.; Hb, 4.34 g. (Sahli); W.B.C., 6,150 per c.mm.; M.C.H., 60.0  $\gamma$ ; packed cells, 12.95%; mean corpuscular volume, 179.8 c. $\mu$ . No malaria parasites were found. The stool examination showed no ova or protozoa; the Kahn reaction was positive (+); van den Bergh, 1.75 mg. bilirubin per 100 c.cm. Yeast mixture, 3 oz. a day, was ordered. Six weeks after starting treatment 20 gr. of totaquina was given daily for four days. Two weeks later he complained of burning of the mouth, and some glossitis and angular stomatitis occurred. This disappeared in about 16 days without local treatment. Two weeks before treatment ceased the dose of yeast was increased to 6 oz. a day, and the blood findings after 16 weeks' treatment were: R.B.C., 4,860,000 per c.mm.; Hb, 15.4 g. (Sahli); W.B.C., 7,700 per c.mm.; M.C.H., 31.4  $\gamma$ . The patient is now back at work and in excellent health.

Case 3.—A female Hindoo aged 24 had been sick for three months with vomiting, palpitations, and weakness. When seen, pallor was extreme and the blood findings were: R.B.C., 640,000 per c.mm.; Hb, 2.66 g. (Sahli); W.B.C., 7,500 per c.mm.; packed cells, 8.9%; M.C.H., 41.5  $\gamma$ ; M.C.V., 139.0 c. $\mu$ ; van den Bergh, 1.5 mg. bilirubin per 100 c.cm. No malaria parasites were found. The stools showed no ova or protozoa. The Kahn reaction was negative. The patient was four months pregnant, and the spleen was not palpable. Treatment with yeast, 6 oz. a day, was begun, and was supplemented ten weeks later with ferri et ammon. cit. gr. 90 daily as there was a lag in the haemoglobin percentage. Four weeks later the yeast was increased to 9 oz. daily, and the following week a stillborn infant was delivered. Improvement was rapid for the first eight weeks, after which the stress of the six-months pregnancy was

manifest, and the count remained more or less constant at this level until after confinement. When she was last seen her condition was excellent. The blood findings were: R.B.C., 3,990,000 per c.mm.; Hb, 12.04 g.% (Sahli); W.B.C., 8,650 per c.mm.; M.C.H., 30.2  $\gamma\gamma$ .

**Case 4.**—A male creole aged 22 had been sick for nine months with weakness, dyspnoea on exertion, and bleeding from the gums. When seen, pallor was marked, and there was some periodontal ulceration and sponginess of the gums, with secondary infection of the left wisdom tooth and oedema of the left cheek. The blood findings were: R.B.C., 1,890,000 per c.mm.; Hb, 8.26 g.% (Sahli); W.B.C., 5,600 per c.mm.; packed cells 27.4%; M.C.H., 43.7  $\gamma\gamma$ ; M.C.V., 144.9  $\mu$ ; bleeding time, 4 min.; coagulation time, 6 min. Subtertian and benign tertian malaria parasites were found. Van den Bergh: 0.6 mg. bilirubin per 100 c.cm. Stools: ankylostome ova +; urine: pus cells +. Spleen just palpable. Treatment with yeast 3 oz. daily was begun, with quinine gr. 15 intramuscularly for four days. No treatment for hookworm was given. The patient was unusually co-operative, and in eight weeks was back at work, the R.B.C. count being 4,350,000 per c.mm., the Hb 13.44 g.% (Sahli), and the M.C.H. 30.9  $\gamma\gamma$ .

**Case 5.**—A female Hindoo aged 38, 7-para, had complained of extreme weakness and troublesome diarrhoea since her confinement five weeks previously. Pallor and weakness were marked, and the blood findings were: R.B.C., 620,000 per c.mm.; Hb, 3.22 g.% (Sahli); M.C.H., 51.9  $\gamma\gamma$ . No malaria parasites were found. Stool examination showed neutral fat and fatty acids ++; no ova or protozoa were present. The spleen was palpable on inspiration. Clinically the case did not resemble sprue, and a diagnosis of nutritional macrocytic anaemia was made. Yeast, 6 oz. a day, was given. Mist. bismuth. sed. 1/2 oz. four-hourly was prescribed for the diarrhoea, which cleared up within 48 hours and did not trouble the patient again except during several nights one week later. This again responded to the bismuth mixture. Two weeks after starting treatment mild glossitis and angular stomatitis similar to Case 2 were noted. This disappeared as the clinical condition improved. The patient was not seen again until approximately five months later, during which time the yeast had been taken irregularly. She was, however, very well. The R.B.C. count was 3,620,000 per c.mm.; the Hb 12.3 g.% (Sahli), and the M.C.H. 34.2  $\gamma\gamma$ .

**Case 6.**—A male Hindoo aged 26 had been ill for five months with weakness, palpitations, and dyspnoea. Pallor of the mucous membranes was marked, and the blood findings were: R.B.C., 1,320,000 per c.mm.; Hb, 6.30 g.% (Sahli); M.C.H., 47.7  $\gamma\gamma$ . No malaria parasites were found. He was given yeast, 2 oz. four times a day, and improvement was rapid and continuous. In seven weeks the R.B.C. count was 4,100,000 per c.mm., the Hb 13.8 g.% (Sahli), and the M.C.H. 33.8  $\gamma\gamma$ . He is now well and has resumed work.

### Conclusions

Sediment obtained from distilling-vats after fermentation has ceased is potent in the treatment of tropical macrocytic anaemia. This potency is due to the presence of autolysed yeast, which has been shown to contain the factor or factors necessary for the normal maturation of red cells and in whose absence an anaemia of the macrocytic type develops. Certain members of the vitamin B complex are also present in the yeast sediment, which has been used successfully to treat angular stomatitis and glossitis and pellagrous dermatitis.

It is preferable to obtain yeast sediment from factories producing unbleached sugar, as the yeast content is higher and calcium sulphate is absent. The latter may produce diarrhoea, possibly on account of its bulk. The yeast sediment used is obtained as a waste product and hence it is cheap. It is also acceptable to religious sects that will not eat beef flesh.

Concentration of the yeast extract and distribution from hospitals, estates, child welfare centres, and schools might be undertaken with valuable results in a country where tropical macrocytic anaemia is common, such as it is in Mauritius.

I am indebted to Mrs. D. Collins, M.Sc., for the analysis of yeast samples; to superintendents of the various district hospitals for permission to treat cases; and to the manager of Medine estate for supplies of yeast. I should like also to thank Dr. d'Arifat, Ag. Director, M. and H. Dept., for permission to publish this paper.

### REFERENCES

- Davidson, L. S. P., et al. (1942). *British Medical Journal*, 2, 31.  
Fairly, N. H. (1940). *Lancet*, 1, 1118.  
— et al. (1938). *Trans. roy. Soc. trop. Med.*, 32, 132.  
Formijne, P. (1940). *Arch. intern. Med.*, 65, 1191.  
Hughes, T. A., and Shrivastava, D. L. (1931). *Indian J. med. Res.*, 19, 565.  
Napier, L. E., et al. (1938). *Indian med. Gaz.*, 73, 385.  
Wills, L. (1934). *Indian J. med. Res.*, 21, 669.  
— et al. (1937). *Biochem. J.*, 31, 2136.  
— and Evans, B. D. F. (1938). *Lancet*, 2, 416.

## FAMINE OEDEMA IN PRISONERS OF WAR

BY

DOUGLAS S. STEVENSON, M.B.E., F.R.F.P.S.

Brigadier, A.M.S.

Oedema or dropsy occurring under conditions of starvation or of semi-starvation has been recognized since the earliest days, in particular being associated with war, and records of it occur in literature of the ancient world. In more modern times Napoleon's army is stated to have suffered in this way in its retreat from Moscow in 1812, and there have been such records from time to time under famine conditions in Ireland, India, China, the Siege of Paris, and Central Europe from 1914 onwards during the 1914-18 war; and in these histories the clinical picture has been fully described and many theories of causation advanced (*Official History of the War*, 1914-18). These theories are all, of course, from the days when accurate biochemistry was unknown and the vitamins equally so, although it was appreciated that the empiric use of certain foods—e.g., citrus juice—did help to cure conditions such as scurvy. A frequent comment in some records is that no evidence of scurvy appeared and that people died of dropsy alone—a clinical finding worth remembering, as scurvy was greatly feared in times of want. Another observation is that in the civil population dropsy affected the adult males rather than the women and children, and it is generally agreed that when famine conditions were ameliorated most of the surviving sufferers were restored to normal health. The mortality figures vary greatly, in some cases being 50%; but seldom is there any clear reasoning as to the cause of the dropsy—simply that it was due to insufficient food.

### Aetiological Factors

What are the possible and what the probable causes of such oedema or dropsy? First, avitaminosis beriberi—the wet type of beriberi with its leg weakness, unsteadiness of gait, dyspepsia, anaesthesiae, and paresthesiae—must be considered. Secondly, nephritis. Richard Bright's (Boyd, 1938) description in 1827 of oedema and albuminuria as the main clinical features and the naked-eye observations of the diseased kidneys is historic. The war nephritis described in detail in the *Official History of the War* (1914-18), and considered to be no different from the acute nephritis of civil life has also to be borne in mind, noting that dyspnoea was often the presenting symptom, oedema was of short duration, and acute uraemia was frequent. Thirdly, we have food deficiency: famine oedema, the German *Oedemkrankheit* or *Kriegsödeme*, the French *Oedème de la famine ou de la guerre*—oedema associated with famine and commonly with war, so frequently partners. These are the most likely causes of oedema occurring in comparatively large numbers of persons and under the circumstances to be stated.

### Cases from German Prison Camps

Recent examination of some repatriated prisoners of war captured in May-June, 1940, in France, reveals that these men developed, in one case at four months, in an average at eleven months, and in one case at as long as fifteen months after capture—i.e., in 1941, and while in Germany—oedema of legs, face, and genitals, preceded by malaise, dyspnoea, and severe headache. Their condition otherwise at that time is not known to us, nor have we any record of the results of the examination of their urine. They were stated to be suffering from nephritis. After capture in 1940 the men were marched considerable distances on an extremely poor diet and in battle dress, some without overcoats, eventually reaching prison camps in different parts of Germany, where they were put to work, still on a diet very low in quality and quantity. This diet is described by each of them separately as consisting daily of one-fifth of a loaf of black bread, a pint of thin soup with some cabbage in it, and a few half-rotten potatoes. On occasion a portion

of swede turnip was given in place of potatoes. This diet does not work out at the claimed German ration containing 55 g. of protein a day and amounting in energy value, from this and other ingredients, in all to about 1,800 calories, but was in fact gravely lacking in protein, especially good-quality animal protein, and was far from sufficient for men who were put to work. In addition the winter of 1940-1 was severe and their clothing inadequate. At about this time—spring, 1941—it was reported by delegates of the Protecting Power and the International Red Cross Committee that there was an outbreak of nephritis among the prisoners of war. The chief symptom was said to be oedema, but hypertension, haematuria, and albuminuria were also reported to be present. These men, diagnosed as cases of "nephritis," are presumably those who have now been repatriated.

Their own description is that their morbid condition began in every case with what they describe as "asthma" or as such shortness of breath that they required to attain a position of rest in the sitting posture. Some stated that they had much diarrhoea; two said that they were constipated; none of them was clear about any great alteration in their output of urine, but some had to rise for this purpose from time to time through the night. Oedema now appeared in their ankles and faces, often becoming extreme and involving also the genitals, the abdomen, and even the hands. Headache became very distressing, and they felt confused in their minds and unable to concentrate on things like simple games and books. None of them described any defect of vision or any superficial ocular discomfort, but their eyes ached with their headaches. When asked whether they noticed any diminution of visual acuity in the dark they were clearly at a loss, and it may be presumed that night-blindness was not present (Weekers, 1943). They were admitted to the local prison camp hospitals, where most remained for upwards of three months and some for as long as a year, although in the majority the oedema cleared up after some 6 to 8 weeks, sometimes relapsing when they got up. While in hospital they were given a rather more generous diet, salt-free, and some had injections, which are presumed to have been diuretics, while others had blood-letting performed. They all knew of other cases in their camps and hospitals, but these others are not with them now.

Red Cross parcels began to arrive about the spring of 1941, and the men were able to get protein food in greater quantity, with this the oedema and all other symptoms cleared up fairly rapidly, but after a period of failure of parcels to arrive or after return to work the oedema was apt to reappear. On disappearance of the oedema their limbs were lamentably wasted.

These men, now in this country and on an adequate diet, have no oedema, no headache, and no symptoms or signs to suggest a fairly recent nephritis, and their general nutrition is reasonably good. Their urine is quite normal, chemically and microscopically; blood pressure, ophthalmological examination, blood urea, and renal function tests are also normal. The men do have symptoms, such as pain in the back, aches generally, depression, and post-prisoner-of-war mentality, and they fear that their kidney lesion will recur. Many of them believe that they are no longer virile, or that, if virile, they are sterile, and reassurance as to this has helped them considerably.

Reviewing their state in 1941 and their present condition, and thinking of the causes of such oedema previously noted, it is thought more than probable that they come under the third category—food-deficiency oedema. Had they been true nephritics it is unlikely that they would have recovered so completely and been without signs or symptoms of nephritis to-day. They did not show the ataxia, leg weakness, dyspepsia, and sensory symptoms of beriberi, nor did they reveal the oral signs that are so often associated with a vitamin B deficiency.

This condition of famine oedema is essentially a hypoproteinaemia (McLean, 1922; Youmans, 1941) and is not a vitamin deficiency (Aykroyd, 1930), although some degree of this may also occur; in suggested proof of this the answers to a number of questions—avoiding leading questions so far as was possible

—revealed that, as already stated, no eye abnormalities occurred; none of them had any signs or symptoms referable to the mouth, such as painful tongue, angular stomatitis (Clarke and Prescott, 1943), bleeding or painful gums; none had pains in the legs or arms; and none had at any time haemorrhages or skin lesions, thus suggesting strongly that even the prison diet contained sufficient to eke out the men's own stores of vitamins A, B, pellagra-preventive factor, C, and K. Admittedly they had headache intense enough to disturb their powers of concentration, and depression, which under the circumstances was not unexpected; but these can be explained without postulating gross vitamin B deficiency.

### Commentary

The condition described is one of much interest and importance to-day in view of its probable widespread distribution. It has been recognized before, and its aetiological factors have been worked out with observations on the biochemistry and on the question of vitamin or endocrine disturbances. Starling (1896a, 1896b) long ago showed the existence of an equilibrium between capillary blood pressure and colloid osmotic pressure, and that disturbance of this in the way of lowered protein in the blood would, in the presence of sufficient sodium chloride, the chief solute of oedema fluid, permit the diffusion of fluid from the blood into the tissues. McLean (1922) pointed out the importance of posture and of gravity in the production of oedema when blood protein was lowered, and showed that complete rest in the prone position would bring about a reduction of such oedema (Weech, 1936), also noting the alteration in the blood of the albumin-globulin ratio, the lowering of the former—often by a half, producing a ratio of 2.2 instead of the normal 4.2—being responsible for oedema, the globulin rarely going below normal. Aykroyd (1922) and Weech (1936) discuss treatment in some detail, mentioning animal experiments, and stress the importance of relying on a good mixed diet with sufficient but not excess protein, this tending to produce gastro-intestinal disturbances such as diarrhoea. In this respect they consider that it is not reasonable to try to give protein intravenously—e.g., in the form of plasma or stored blood transfusion—because the amount transfused cannot contain more than a limited quantity of protein. The total of fluid and the effect of such a procedure is only likely to cause greater oedema, pulmonary and otherwise, with possibly fatal results. This should be borne in mind when starved populations are being relieved. Relief should be by good mixed diet alone—not too high in protein, and containing, so far as possible, all the accessory food factors (*Bulletin of War Medicine*, 1944). Such a diet can be worked out comparatively simply without including a great many complex substances. McCarrison (1920) gives an excellent survey of the endocrine disturbances brought about in such conditions of semi-starvation, and these might be studied with advantage by persons organizing relief.

The importance of these observations in regard to our own returned prisoners would appear to be that the men think that they have had a serious kidney disease, that it will probably recur, and that their virility has been sapped. They therefore need careful reassurance as to the true facts—namely, that they have not been suffering from a pathological condition which has done them any permanent harm. It is important that hospitals generally should be advised of the existence of this state of matters, because in a number of cases these men have been instructed to take great care to avoid getting wet feet, or cold, and warned to wear woollens next their skin and generally against hard work. Their cases have mostly been labelled "nephritis, recovered from," and a guarded prognosis has been given in the form of a recommendation that they could be employed in Category C. In view of the anxiety state which has been produced in most of them (Newman, 1944) it would perhaps be wiser that some should be discharged from the Services with the reassurance that before long they will find themselves fit normal men, able again to take their places in the general labour market, and that such of them as wish to remain in the Services should be kept temporarily in a lower category and rehabilitated gradually at a convalescent depot.

I wish to thank Lieut.-Gen. Sir A. Hood, Director-General, Army Medical Services, and Major-Gen. J. A. Manifold for permission to publish; and the Royal College of Physicians, Edinburgh, for use of their library.

## REFERENCES

- Aykroyd, W. R. (1930). *British Medical Journal*, 2, 247.  
 Boyd, W. (1938). *Textbook of Pathology*, Kimpton, London.  
*Bulletin of War Medicine* (1944). Jan., p. 309. Foreign Office (bis): Reports of United Nations Conference, Hot Springs.  
 Clarke, A. Grey, and Prescott, F. (1943). *British Medical Journal*, 2, 503.  
 McCarrison, R. (1920). *Ibid.*, 2, 236.  
 McLean, F. C. (1922). In *Endocrinology and Metabolism*, Ed. L. F. Barker, 4, 158, New York.  
 Newman, P. H. (1944). *British Medical Journal*, 1, 8.  
*Official History of the War (1914-18): Medical Services*, 1, 450, London.  
 Starling, E. H. (1896a). *Lancet*, 1, 1331.  
 — (1896b). *J. Physiol.*, 19, 312.  
 Weech, A. A. (1926). *Lancet*, 2, Ser. 46, 223 (with a very full bibliography).  
 Weekers, R. (1941). *Journal of War Medicine*, 3, 303.  
 Youmans, J. B. (1941). *Nutritional Deficiencies*, p. 236, Lippincott, Philadelphia.

## Medical Memoranda

### Prevention of Industrial Dermatitis

The admittedly high incidence of industrial dermatoses in many of our war factories is a serious matter, and doubtless the present increase is attributable to several factors, among which the difficulty of selecting personnel for hazardous jobs, the introduction of new hazards and inexperienced workers, and inadequate facilities for proper cleansing of the skin all play a part. To these must be added the difficulty in getting certain types of work-people to use thoroughly such preventive measures as are provided against well-known skin hazards. Constant supervision by the foremen and charge-hands is essential to deal with this, and, in addition, the works doctor, by paying frequent visits to each department, must see that such supervision is exercised. Barrier creams, for which so much is often claimed, have their uses, but in my experience they are disappointing, and necessarily depend too much on the intelligent co-operation of the workman.

Two of the most common and most troublesome varieties of industrial dermatitis met with in aircraft and other machine factories are undoubtedly oil acne from close and long contact with brown machine-cutting oils, and paraffin dermatitis due to degreasing and cleaning engine parts in paraffin baths and bench troughs. These two hazards may give rise to a high incidence of skin trouble and to a very large amount of compensatable absence from work, and, of course, interruption of production and constant replacement of skilled personnel, who dislike the jobs. Faced with this problem in several of the factories in my medical charge, I sought in vain for some new, easily applied, and efficient means of meeting it, until my attention was arrested by a leading article on skin hazards in aeroplane manufacture (*B.M.J.*, 1942, 1, 188), reviewing a report by L. Schwartz and J. P. Russell (*Publ. Hlth. Rep.*, Wash., 1941, 56, 1581) on the subject, in which reference was made to the use of neutral sulphated castor oil in 2% wetting agent as a substitute for soap after work. This suggested to me the possible value of such an emulsion as a skin cleanser after hazardous work instead of using, before work, barrier creams or lanolin mixtures, which invariably were dissolved off by the oil or paraffin.

With the assistance of my pharmaceutical suppliers various experiments were made and several mixtures were tried, including three of a different nature kindly sent me for trial by Dr. M. W. Goldblatt, of Imperial Chemical Industries. Ultimately a comparatively cheap source of supply of the neutral sulphated castor oil was found; this was obtained in bulk and the wetting agent was added. It is distributed, where indicated throughout our factories, in gallon tins or bottles to the departments concerned, which dispense it to each wash-place in a round "elastoplast" tin, the lid of which is pierced with two opposing 1/4-in. holes. Directions for use are put over the wash-place, and consist of the simple instruction to wash the hands in water (hot or cold), then, while still wet, to pour a tablespoonful of the "hand cleanser" into one palm and rub well into both hands and forearms. It is then rinsed off in cold water. This procedure has proved an immediate and popular success, the skin being left clean, supple, and quite comfortable, both after long soiling with machine-oil or engine-grease, and after immersion in paraffin.

The use of this cleanser has since been extended with equally good results to various other jobs the chemical agents of which remove the normal sebaceous matter of the skin and cause a dry fissured dermatitis so prone to secondary infection; and to the stores, where the handling and cleaning of rust-proofed

and greased bar and sheet metal is a frequent cause of skin eruptions. The rubbing down of plaster castings, causing traumatic dermatitis, had also given trouble, and this, too, is obviated by the use of the "hand cleanser." The method was first put into use in our main factory in Nov., 1942, and the following table shows the marked reduction already achieved both in the incidence of all forms of dermatitis in the factory and in the incidence of oil acne and paraffin dermatitis in the machine shops alone:

	Dermatitis Incidence			
	Factory		Machine Shops Only	
	1942	1943	1942	1943
Average operative personnel ..	3,300	3,350	500	505
Cases not losing working time	375	162	67	17
Cases losing time beyond shift	39	23	5	1
Total Cases .. ..	414	185	72	18
Percentage .. ..	12.5%	5.7%	14.2%	3.5%

Oil acne affecting the front of the thighs due to oil-saturated aprons has been prevented by waist-high metal guards on the automatic cutting machines.

I have to thank the Senior Medical Inspector of Factories for his interest in and sympathetic attitude towards this experiment and its results, and it is with his approval that this preliminary report is published. His department of the Ministry of Labour has sent a member of its Dermatological Advisory Panel to investigate my method and dermatitis statistics, and doubtless will consider the question of its general adoption. This, however, must depend upon the Ministry of Food's making a higher allocation of the oil to supplement the present very limited supply of the raw material.

N. HOWARD MUMMERY, M.R.C.S., L.R.C.P.

Aircraft Factory Medical Officer; Ex-Chairman  
Association of Industrial Medical Officers.

### Skin Eruption due to Luminal

In the course of psychiatric practice one occasionally meets with instances of the intentional swallowing of a large quantity of luminal (gr. 50 to 100), but recovery usually ensues with energetic treatment. On the other hand, from time to time instances of cutaneous eruptions after the ordinary use of luminal have been recorded, though these cases must be very rare. The following recent case gave rise to much interest.

#### REPORT OF CASE

The patient, an unmarried woman aged 55, has been resident in this mental hospital since Oct., 1932, when her case was diagnosed as acute mania. She has been mentally deranged for 23 years, but showed no evidence of organic disorder until Dec., 1942, when she had two spontaneous epileptic convulsions. The Kahn test was negative, but the pupils were unequal and cerebral arteriosclerosis was suggested. In July, 1943, she again had epileptic fits, and was given luminal (phenobarbitone) 2 gr. twice daily, starting on July 19.

On Aug. 8 a morbilliform rash was noticed on various parts of the face, trunk, and limbs. It extended rapidly, and became especially thick and confluent on the back and on the extensor surfaces of the arms and legs, leaving the flexures comparatively free. The temperature on the first day was 103.2°, and a mild pyrexia persisted for two weeks, varying from 99 to 101°. On the seventh day of the rash the cervical glands were enlarged, but there was no abnormality of the mouth or pharynx. At the end of two weeks the rash began to fade. On the tenth day of the rash a blood count showed a slight leucocytosis: red cells, 4,530,000 per c.mm.; Hb, 90%; C.I., 1; white cells, 10,500 per c.mm.—polymorphs 78%, eosinophils 1%, basophils nil, lymphocytes 17%, monocytes 4%. The luminal was discontinued on Aug. 8. There was considerable desquamation when the rash had faded, and it was not until about five weeks after the drug had been stopped that the skin recovered its normal appearance.

On Dec. 14 the patient was again put on luminal. This time 3 gr. was given twice daily. After a week an eruption appeared on the limbs; but it was much less intense, and disappeared in two or three days in spite of continuing with the drug. There was no pyrexia. The blood calcium on Dec. 22 was within normal limits. She is still taking the drug daily without any further skin trouble.

#### COMMENT

Diagnosis was at first in some doubt, but the possibility of specific fever was excluded and a drug eruption suspected. This was confirmed by reference to the literature. Menninger (*J. Amer. med. Ass.*, 1928, 91, 14) recorded 3 cases of his own and collected records of 41 others. He found that a luminal eruption may arise in one of two forms—either an early one with urticarial wheals occurring soon after administration of the drug, or a later maculo-papular eruption sometimes like scarlet fever and at other times like measles. The latter type of rash is accompanied by pyrexia in more than 50% of cases, the eruption



tion usually not appearing until some days after the drug is first administered, and it may recur when the drug is renewed. There is no constancy in the dose giving rise to the eruption, which usually lasts a few days after the drug is stopped or may take some weeks to disappear, when there may be heavy scaling or peeling. The cervical glands are sometimes enlarged and occasionally there is a leucocytosis with an increase in eosinophils. Gastro-intestinal symptoms, headaches, dizziness, stomatitis, pharyngitis, and conjunctivitis have also occurred.

The immediate withdrawal of the drug is the only effective way to give relief. Apart from that, only simple local applications to relieve discomfort are necessary. Intravenous injection of 5 c.cm. of a 10% solution of sodium thiosulphate daily for 5 or 6 days has been recommended for obstinate and severe rashes.

The rarity of luminal rashes suggests that there is some personal idiosyncrasy to the drug. It has also been suggested that it is due to calcium or alkali deficiency. Menninger states that all we can say about it is that it is probably a selective tissue reaction to the drug dependent upon constitutional factors about which we are still ignorant.

F. T. THORPE, L.R.C.P., D.P.M.,  
Wadley Mental Hospital, Sheffield.

### Neorsphenamine and Infective Hepatitis

In an article published in the *Journal* for Aug. 28, 1943 (p. 261), Dr. D. R. Macdonald refers to the view that jaundice occurring during the treatment of syphilis with neorsphenamine may be due to the synergic action of neorsphenamine with the causal agent of infective hepatitis, probably a virus. Cases of jaundice that have recently been occurring in the unit to which I am the regimental medical officer seem to illustrate this view.

I have been with the unit for two and a half years, during which time we have been stationed in Northern Ireland, England, Gibraltar, and, now from March, 1943, in a "Plains" station in India. Two sporadic cases of infective hepatitis occurred in the unit in Aug., 1941, and March, 1943, and one case of transient jaundice in a man receiving neorsphenamine appeared in November, 1942. During this time there were always some men in the unit receiving weekly injections of neorsphenamine, the numbers varying, and averaging from four to five under treatment at any one time.

#### A RECENT SERIES OF CASES

During the five months from Aug. 1 to Dec. 31, 1943, a series of cases of jaundice appeared. Excluding cases in patients receiving neorsphenamine, 12 cases occurred and were admitted to hospital. The onset of jaundice was preceded by about four or five days by symptoms of nausea and epigastric discomfort and sometimes vomiting. The cases occurred singly, and were evenly spread over the period. At this time seven men of the unit were receiving regular injections of neorsphenamine, and out of these six developed jaundice and showed symptoms similar to the cases of infective hepatitis. Again the cases occurred singly and were spread evenly over the four months. The strength of the unit during the period was about 900. The men were receiving courses of neorsphenamine identical to that given to other cases during the long period when jaundice was not seen. Each had finished one course of ten weekly injections: in one case jaundice developed at the end of a rest period of four weeks, and in another after the first injection of a second course at the end of four weeks' rest. These facts seem to indicate that the jaundice was not a simple intolerance to arsenic.

#### DISCUSSION

Though the series of cases is a small one there does seem a clear connexion between the appearance of jaundice in six out of seven men receiving neorsphenamine and the simultaneous appearance of cases of infective hepatitis in the rest of the unit. It supports the view that jaundice occurring during the course of such treatment may be due to infection with the virus responsible for infective hepatitis and that patients receiving neorsphenamine are in fact much more susceptible to this infection than normal people. Further, if it is accepted that these six cases in the neorsphenamine patients were really cases of infective hepatitis it suggests that the proportion of the unit actually exposed to infection by the virus must have been high (since in this group with increased susceptibility to the disease six out of seven go down). However, in the rest of the unit 12 cases were all that occurred among 900 men, indicating that in normal people only a small proportion (about 1%) among those exposed to infection by the virus of infective hepatitis actually contract the disease.

P. N. COLEMAN, M.B., Ch.B.,  
Captain, R.A.M.C.

## Reviews

### ENDOCRINOLOGY

*The Diseases of the Endocrine Glands*. By Hermann Zondek, M.D. Fourth (second English) edition. Translated by Carl Pransnitz, M.D. (Pp. 496; illustrated. 40s.) London: Edward Arnold and Co. 1944.

Prof. Zondek's book originally appeared in Germany in 1926. After he left Berlin he was first at the Jewish Hospital in Manchester and is now director of the medical section of a hospital in Jerusalem. Two English editions of this book have now appeared—in 1935 and 1944. The general scheme remains the same, but there have been extensive revisions and additions called for by fresh discoveries. He is rightly insistent that endocrinology cannot be comprehended apart from general internal medicine. A number of fundamental hypotheses, largely based on the author's personal experiences, give this book its special outlook. He is clear that not only is hormonal influence a variable quantity but that the receptivity of the tissues plays an important part in such variations. When we see a patient with general hyperthyroidism and yet with myxoedematous legs, obviously the capacity for reception of circulating thyroxin has, in that instance, varied greatly in different parts of the body. Again, functional and anatomical changes in endocrine glands should not always be regarded as the cause of disease, but in many cases as the reaction of the glands to morbid processes primarily located in other organs; as an effect rather than a cause. Hormones intensify new cellular functions which appear as evolution and differentiation proceed, but even in the most highly developed beings, however, not all of them are indispensable to life. Moreover, the endocrine system is but one link in the chain of vegetative functions of the organism. Failure to realize this leads to a dangerous over-estimation of the importance of the hormonal factors.

From such a sane and balanced foundation a sounder superstructure can be safely built rather than on the airy speculations too rife in the recent past. It is noteworthy, in view of the present interest taken in disturbance of the water-salt balance as a cause of obesity, that the author has for years called attention to this type under the title of cerebro-pituitary-peripheral obesity. The book is copiously illustrated and is practical in form throughout. We can repeat the cordial welcome which we extended to the former English edition.

### TRANSURETHRAL PROSTATECTOMY

*Transurethral Prostatectomy*. By Reed M. Nesbit, M.D., F.A.C.S. A Chapter on the Vascular Supply of the Prostate Gland. By Rubin H. Flocks, M.D. (Pp. 192; illustrated. 57 5s or 41s.) Springfield and Baltimore: Charles C. Thomas. London: Baillière, Tindall and Cox.

There is no operation in surgery the success of which is more determined by the skill and the experience of the operator than that of transurethral prostatectomy. Formerly there were few reliable descriptions in urological literature of the technique to be employed in carrying out this difficult procedure, and the beginner was compelled to acquire his own technique by the painful process of trial and error. Fortunately this defect is now being remedied, and the operator with little personal experience of transurethral resection is able to obtain guidance from those who are experts. Dr. Nesbit gives a detailed and very clear description of the particular technique which he employs in the Michigan School of Urology. He does not claim that this is the only method of performing this operation, for he believes that the existence of different methods is both logical and desirable. All that he claims is that it is the method which in his hands has proved the most serviceable.

The material in this book is arranged in four sections. The first lays down the principles and various techniques of prostatic resection, the second contains the author's appraisal of the place of resection in prostatic surgery, the third provides a history of the operation, and the fourth gives an excellent bibliography of the subject. One of the distinguishing features of the author's own technique is that instead of beginning his resection in the mid-posterior line, as do many resectionists, he starts work anteriorly at eleven and one o'clock on the lateral lobes. He does so for two reasons: first, because in

this position there is less prostatic tissue and the landmark of the internal sphincter can more easily be disclosed; and, secondly, because if the first incision is made in the mid-posterior line the tissues mobilize and retract from view in an upward direction. His description of the three stages of his operation—the intravesical, the subvesical, and the apical, the last of which includes the prostatic tissue lying adjacent to the external sphincter—is an exceedingly clear one, and by thus subdividing it he ensures that obstructing tissue is completely removed. That the technique which he describes ensures thoroughness is confirmed by the fact that in only 5% of his cases has a resection to be repeated. Although the reviewer's own technique is a different one, he can appreciate the value of the method described in this book. It can be confidently recommended to all who are interested in this important subject.

### THE POLISH MEDICAL SCHOOL, AT EDINBURGH

*Polish School of Medicine at the University of Edinburgh. (Pp. 72. No price given.)* Edinburgh: Oliver and Boyd Ltd.

Not often in these straitened times does a book come to the reviewer's table in handsome embossed binding and with four-and-twenty full-page illustrations on art paper. We are far from saying that the formation in 1941 of the Polish School of Medicine at the University of Edinburgh was not worthy of such a commemoration. The event was one of much importance; in a sense it made academic history, for there is said to be no previous record of any State setting up its own university with its own professors lecturing to its own students in their native tongue on foreign soil and as part of a foreign seat of learning. Possibly even the slighter circumstances connected with such an inauguration are worthy of permanent record, even to facsimile reproductions, again on art paper, of the preliminary correspondence and of the programmes of the ceremony. But we wish that in this sumptuous setting some account might have been given of the past history of Polish medicine or of the six universities of Poland, whose names and coats of arms are inscribed on the cover. As it is, the record, most artistically produced, is only an extended newspaper narrative of the proceedings and a statement of the activity of the first and second academic years. In the second year 113 students matriculated, of whom 33 were women.

This publication gives us the opportunity to congratulate again both the University of Edinburgh and the Polish Government on the continuance of Polish medical science in the sore days of exile. The Edinburgh Medical School itself must experience gratification at this new link with the Continent of Europe, which has been shaped in the fire of Scottish generosity.

### Notes on Books

A second edition of *The Vitamins: A General Survey for the Practising Pharmacist* has been published by the Pharmaceutical Society of Great Britain at 2s. 6d. The material of this book is based on a series of articles which appeared in the *Pharmaceutical Journal* in 1938-9, but it has been thoroughly revised and much of it rewritten. It contains chapters on terminology, units of measurement, chemical and physical properties, vitamin values of common foods, requirements of human subjects, effects of overdosage, physiological action and signs of deficiency, pharmaceutical preparations, and the potency of commercial preparations (196 of them!). It contains also a list of 10 "books to read," and one of 22 "makers and suppliers" (with addresses) of the commercial preparations. There is a useful index. The size of the book (5 in. by 7½ in.) is much more convenient than that of the first edition, but it is still bound only in paper. It has been very carefully written and should prove of great value to medical practitioners as well as pharmacists who want information in a compact and readily available form.

A third edition of the pamphlet *War-Time Information for Pharmacists*, compiled by the *Pharmaceutical Journal*, is published by the Pharmaceutical Press, 17, Bloomsbury Square, W.C.1, at 1s. 6d. post free. As before, the contents are arranged in the alphabetical order of their headings, and there is a convenient list of addresses at the end. The information has been brought up to date, and some of it will be useful to general practitioners as well as to pharmacists.

*A Book of Food*, by S. P. B. MAIS, is published by Transatlantic Arts Ltd. at 4s. 6d. This is a first book on food written for children, showing how it is grown, where it comes from, and which foods are best for growth and health. Illustrations fill the larger part of each page; the statements in the text are simply made and accurate, and there are only two pages at the end that the children for whom the book is written may find dull. Intelligent children may be stimulated by it sufficiently to ask questions which their parents cannot answer.

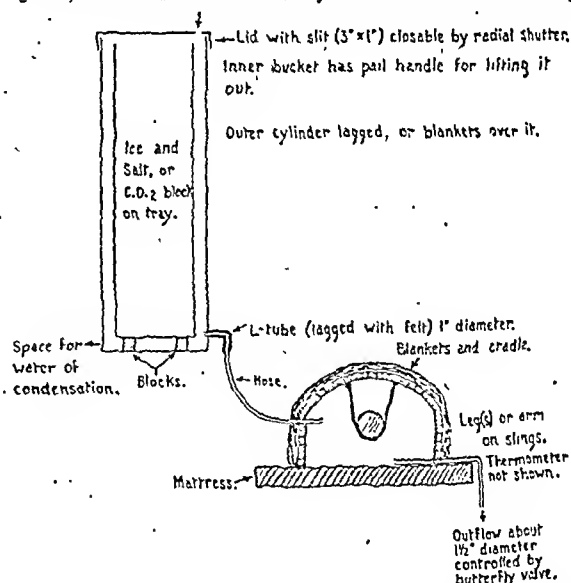
## Preparations and Appliances

### TREATMENT BY COLD AIR: A GRAVITY METHOD

Dr. FRANK C. EVE, F.R.C.P., writes from Hull:

Treatment by dry cold is now advised when circulation is blocked by frost-bite, trench foot, traumatic arterial spasm, arterial embolism, etc., in order that the limb may not decompose before its circulation is restored. In the *Journal* of Feb. 12 Capts. Bigelow and Lanyon, R.A.M.C., describe an ingenious but complicated apparatus for this purpose. May I suggest a simpler substitute, working by gravity? Although cases of this kind are not in my province as a physician, I had an analogous apparatus made for treating pneumonias in children by "Alpine air," from which the moisture and impurities had been frozen out. It worked all right but soon became superfluous, because sulphapyridine came into use, with a run of 52 cases without a death.

The apparatus was merely a metal cylinder 2½ ft. high and 1 ft. diameter (from memory) containing ice and salt. This was enclosed in a similar cylinder 2 in. wider. The annular space between them was occupied by a long flange (not shown in diagram) soldered to the inner cylinder in the form of a spiral



plane (at about 40 degrees). The heavy cold air glided down this and emerged through a spout, falling in a gentle stream on the child's face—walled round by a folded bath-towel into a sort of pond of cold pure air.

It seems probable that this simple gravity method would suffice to keep a bloodless limb cold enough if it was slung under a cradle well insulated by blankets and a mackintosh. If found adequate this would be better than the proposed method by brine electrically refrigerated pumped through narrow (blockable) tubes circulating round a metal chamber. A tinsmith made my apparatus very cheaply; possibly two tall iron fire-buckets separated by coils of barbed wire might do at a pinch.

If solid CO<sub>2</sub> were available (as from undertakers or ice-cream makers) the same device should work even better. Or it could be made as quite a small fixture just above the cradle—merely a felt-covered tin with a tray of wire mesh to hold the standard block of CO<sub>2</sub> and an exit tube below serving also as a trap for condensed water. Another larger exit tube would lead the air and CO<sub>2</sub> harmlessly away from the cradle (and patient) to the floor. A slit in the lid would regulate both flow and temperature. These devices (when once tried out) could soon be improvised; and where there is frost-bite, it will be available.

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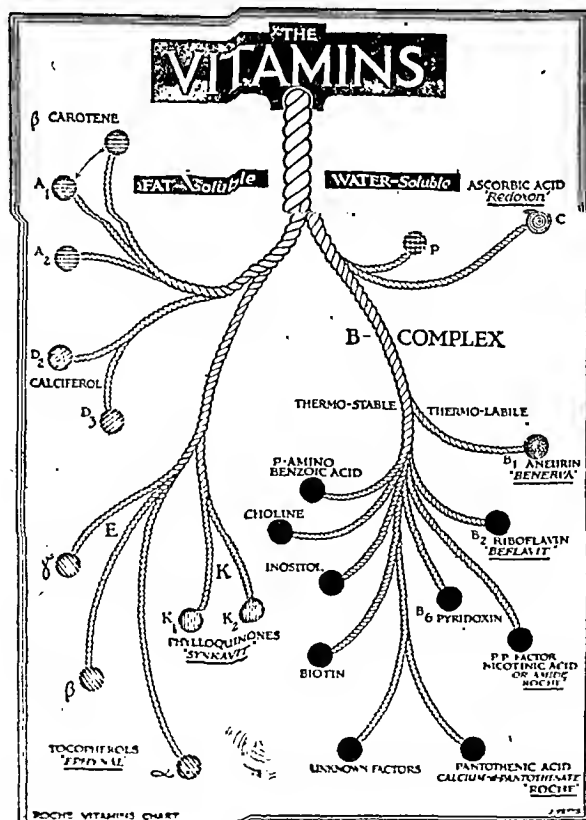
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## BRITISH MEDICAL JOURNAL

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## BEFORE NEGOTIATIONS BEGIN

At the meeting of the B.M.A. Council last week a number of important decisions were taken and two highly significant documents were placed before it, the one for information and the other for discussion as the basis of a report of the Council to the Representative Body. As we believe that these two documents are at the moment of supreme interest and importance to the whole profession, including those who are not members of the Association, we have printed them in the opening pages of what is principally a scientific, medical newspaper. In normal times many medical men are for the most part uninterested in medical politics, being more concerned with applying their science and art in the treatment of the sick, for this is their profession. To-day, however, every medical man willy-nilly must become a medical politician, and perhaps a very big majority in the profession are now thinking in terms of medical politics for the first time. Many are in the unfortunate position of having to try to speak a language with only an elementary knowledge of its grammar, and therefore they tend to look with some suspicion upon the grammarians. These are the people who, in times of stress such as the present, tend to accuse the B.M.A. of "doing nothing," of "not giving a lead," or, even worse, of carrying on secret negotiations and discussions with the Ministry of Health. Such accusations—and they are being made—are unjust and baseless. Those who at this late moment wish to learn the ABC of medical politics might catch up a little bit by reading two documents—one the B.M.A.'s proposals for a General Medical Service for the Nation,<sup>1</sup> available as a grey book, and the other the Draft Interim Report of the Medical Planning Commission, published only two years ago.<sup>2</sup> This draft report was the result of co-operative work between the Royal Colleges, the Association, the Society of Medical Officers of Health, and the Medical Women's Federation. The appearance of the Beveridge report, with its serious medical implications, interfered with the continued deliberations of the Medical Planning Commission, and hence postponed indefinitely the preparation and publication of a final report. Out of the Commission came a smaller committee representing the same medical interests. This Representative Committee entered into discussions with the Ministry of Health, but without any power of negotiation. Apparently many voices have uttered the fantastic sugges-

tion that the Representative Committee was responsible for the White Paper. If the Representative Committee can be said to have had any influence at all it was in preventing the Government from drafting a document plainly advocating a whole-time salaried service, and leaving little or no room for further discussion on this point. Of the emotional cross-currents in the life of the profession to-day, the strongest is suspicion. We may be sure that those who have not really at heart the interests of the medical profession will take full advantage of the suspicions that prevail, and use them to promote disunity among us at a time when unity is the one indispensable weapon needed by the profession's negotiators with the Government in the days to come. As doctors we boast proudly of our individualism, but this is a characteristic that can become so hypertrophied as to be as dangerous to the profession as its tooth was to the sabre-toothed tiger. It is as well to remember that there are now 46,195 members of the B.M.A., and that there cannot be 46,195 separate plans for reorganizing the medical profession.

The report at page 643 of our current issue marks both the end of one phase and the starting-point for the next. The Representative Committee is now dissolved. A negotiating body is to be set up, to begin work after July. This will be composed of 30 members: 16 of these are to be appointed by the British Medical Association (8 by the Council and 8 by the Representative Body at its meeting in July); 3 are to be appointed by the Royal College of Physicians, 3 by the Royal College of Surgeons, and 2 by the Royal College of Obstetricians and Gynaecologists; 2 are to be appointed by the Society of Medical Officers of Health, 1 by the Medical Women's Federation, and others by the Royal Scottish Medical Corporations. In so far as it is possible to devise any way of electing representatives that would satisfy most people at any one moment, the method proposed and the distribution of representatives would seem to be the fairest way of ensuring that our negotiators can speak with one voice when it comes to the hard weeks of negotiation that lie ahead. It can, however, speak with this one voice only if it is trusted and not suspected by individual doctors or groups of doctors. The Representative Committee at its last meeting, and the Council at its meeting on May 3, decided to hold no more discussions with the Minister or with the Ministry of Health until the negotiating body is set up at the Annual Representative Meeting in July. The last communication with the Minister of Health was to put before him certain written questions with a request that written answers should be given to them. These questions and the answers returned by the Minister are set out in full, with no omissions, as the second "contribution" in the opening pages of this week's *Journal*.

In the fallow period between now and the moment when negotiations begin it is hoped that doctors both individually and in groups will give as much time as they can spare from their daily work to an intensive study of the White Paper and to any other published matter that has a bearing on it, and more especially to the report of the Council to the Representative Body. It is most likely that some sections of the Press will isolate for quotation parts of the report that will help them to prove whatever mis-

<sup>1</sup> *British Medical Journal Supplement*, 1938, 1, 253.<sup>2</sup> *Ibid.*, 1942, 1, 743.



leading case they may wish to present. In spite of much admirable educative work that has been done over the past year or so by the Association, the public is still most ill informed about medical matters, and still fails to understand why we as a profession attach importance to certain fundamental aspects of our work. It would be a mistake to think that the public is generally sympathetic to the medical profession as a whole. The most obvious form of misrepresentation is to depict doctors as generally opposed to reform because of their supposed financial interests in the present way of giving personal medical service to the people of this country. Like most other workers, doctors still believe that a labourer is worthy of his hire, and see no reason to be ashamed of working for hire. Many people think, speak, and write as if the medical profession should turn itself into a philanthropic institution; hence the popularity of the slogan "Free treatment for all."

Out of many admirable statements in the Council's report we would pick upon the following as summing up succinctly the attitude of most medical men to reform: "To agree upon the objects of national reconstruction in the field of health is not necessarily to approve the methods or the time-table proposed." There should be no need to recapitulate in these columns the successive steps that have been taken by the B.M.A. to bring about medical reform during the past 20 or 30 years. During this period it has found both Government and public completely unresponsive to every demand for reform made, reforms that had the double virtue of being in the interests of the public and not contrary to the interests of the majority of the medical profession. Both publicly and privately, doctors should make it clear where they take their stand—and this is not against reform, which they recognize to be necessary, but against certain specific proposals in the White Paper, and against the motives which appear to lie behind these. There is in fact a flat contradiction between the excellent principles long accepted by medical men, and printed at page 47 of the White Paper, and the proposals contained in it. The medical profession is, too, opposed to the time chosen to introduce these reforms. Again it should be clear that it favours the preparation of plans and the discussion of ways and means of carrying out these plans, so that it may lay them before the now large numbers of medical men engaged in the Forces who will carry on the work of the doctor in the two or three decades after this war. To introduce legislation in wartime, with the younger generation of doctors away, would seem to betray the promise made by the Prime Minister not to legislate during the war on controversial matters. Paragraph 15 of the Council's report makes this moderate statement: "It [the B.M.A.] is inclined to suspect that the inspiration of the Government's document is political rather than medical." Many sober observers go further than this rightly cautious utterance. It is because the profession suspects that the White Paper is the result of political bargaining that it distrusts the proposals made, couched in however fair language. If, as we understand, the White Paper is in essence a Cabinet document, it would seem that the right hand of the Cabinet was unaware of what its left hand was up to.

From the point of view of the general practitioner the key proposal of the White Paper is the establishment of health centres to be built, owned, and administered by the major local authorities—namely, the county councils and the county borough councils. For rewarding the staff of these centres the Government favours payment by salary. The practitioner will enter into contract with the local authority and the Central Medical Board. If in fact such a proposal is accepted and acted on, then it is difficult to see any other fate for the future general practitioner than that of a whole-time salaried servant of the State. The threat to the other key structure in our medical services is the threat to the voluntary hospitals. This threat is aimed at them through the agency of the proposed joint authority, through the drying up of voluntary contributions, and through the suggestion that, if the Government pays in full for the services of the voluntary hospitals, this will necessarily involve loss of autonomy and status. The real issue, in fact, is not whether money for health services should be collected in this way or that way, or should be distributed to those who render the services in the form of fees or of salary, but whether the medical profession is to be socialized: turned, in other words, into a body of men deprived of that freedom of thought and action which over the centuries has made it possible to substitute for the magical incantations and practices of the whole-time employee of the Temple the rational thought and free practice of contemporary medicine. When, in addition to this, the profession sees a Government so frightened of the power of local authorities, so hampered by the interdepartmental jealousies of Government Departments, as to leave these unsound dwellings untouched, then as a profession we cannot help but suspect its motives. The skeleton structure into which the body of medicine is to be moulded is the skeleton not of a developed adult but of a disjointed puppet. Except for a vocal minority of doctors grouped round a party political flag, by far the greater part of the profession is rigidly opposed to a whole-time State salaried medical service, and it is upon this one issue that opposition must be unshakably offered in the coming months.

To resist all proposals moving in the direction of a whole-time salaried State medical service must not be taken as opposition to the White Paper as a whole, nor must it mean a refusal to negotiate, as some doctors apparently would so like to refuse. It is necessary to be clear-headed in opposition, and whole-hearted in co-operation in reforms agreed to be necessary. Some of these reforms are put forward in the second half of the Council's report to the Representative Body of the British Medical Association, in paragraph 38 onwards, in positive proposals that crystallize the results of the deliberations of the Council's Standing Committees.

The profession can approach the coming negotiations at least with the knowledge that in the present Minister it has to do with a man who has shown himself sympathetic to the professional point of view. It will be able to enter negotiations fully conscious of a proud record of service, and fully aware that time and tradition have given it a stake in the country to which it is justifiably entitled and which in equity it is entitled to defend.

## REPORT ON MEDICAL EDUCATION

War is the supreme test of a nation's health services, but in this war the verdict has been something of a paradox. On the one hand the national health has shown a surprising resilience, and statistics of sickness have improved. On the other hand there has been wide concern at the poor state of health revealed by surveys and by the mass evacuations of 1939 and 1940. The Peckham experiment,<sup>1</sup> for example, finds less than 10% of its subjects without some disorder of health. Evacuation focused the attention of the country on the frequency of infestation by parasites, skin diseases, and defects of the teeth, eyes, ears, nose, and throat in city children. Much of this ill health demands as a remedy the provision of better homes, food, and work for the people, but much of it demands medical attention which is not now available. There is a shortage of practitioners, specialists, and pathologists. The war has also revealed the importance of newer branches of medicine, such as industrial medicine, psychology, applied physiology, and nutrition, which are still imperfectly recruited in this country. There is a demand that more money should be spent on research, and in particular that the deficiencies of this country in applied pharmacology and chemotherapy should be repaired. High-ranking officers in the medical services of the armed Forces and of industry complain that the newly qualified practitioner is lacking in adaptability to unrehearsed situations and in knowledge of the preservation of the health of the mind and body. On all sides, therefore, there is a demand for more doctors and better doctors. Nevertheless, it would be a mistake to imply, as some recent newspaper headlines have, that the medical student of to-day has fallen from grace or actually deteriorated. Most teachers would agree that medical students are at the very lowest reckoning a good sample of our university population. Our only doubt about them had been whether they had the stamina of their forbears, and this has been abundantly proved by the war. The verdict on the medical student must be very much the same as that on the nation's health. He has shown a surprising resilience in the face of a continual overloading of the medical curriculum, but there are grounds for dissatisfaction with both the quality of the students entering the medical schools, and the training they receive there.

Medical education, then, is a subject of interest to the whole profession, and for this reason it is to be hoped that the report on medical education by the Planning Committee of the Royal College of Physicians of London will be widely read. The committee is to be congratulated on having produced an extremely able report, which shows a notable advance on documents of this kind that have appeared in the past. The two previous reports on social and preventive medicine, and on psychological medicine, which the College published last year, were widely criticized as examples of the old pipe-line theory of education, in which the student is regarded as a passive and distensible receptacle into which more and more facts are poured. In the present report the College has appreciated that the problems of medical education cannot be solved by the

simple process of addition, and has addressed itself to the more difficult process of integration. To obtain good students of medicine the profession must be made attractive, and the students must be selected by some better criterion than ability to pay. The committee proposes that university fees should be abolished and maintenance grants paid to students in need. This is not as revolutionary as it sounds, for students' fees only pay a third of the cost of their education, and in the U.S.A. at the present time all medical students are in uniform and in receipt of army pay. It does, nevertheless, entail very careful choice of students. The committee deprecates the use of examinations and scholarships for this purpose, as they lead to premature specialization at school and often produce an undesirable kind of candidate. It emphasizes the importance of character and personality and suggests selection on the basis of these qualities and the school record. The selection of anything from 2,500 to 5,000 students a year from a considerably larger group of applicants by the method of the interview seems to us a more formidable undertaking than the committee appreciates. It would hardly be possible without psychological tests similar to those used for the selection of officers in the Army. Intelligence is not less important than character and personality, and tests of intelligence could be used to sift the applicants. It is true that stupid students often make successful doctors, but it is doubtful whether they ever make good doctors.

The body of the committee's report is informed by a number of general ideas. It is fundamental that the student should be taught method and principle rather than facts. Only in this way can the university provide the doctor with a discipline and an instrument which will allow him to adapt himself to the rapid advances of scientific knowledge and to maintain a progressive self-education. There must be better co-ordination of studies, both vertical and horizontal: vertical between the three divisions of pre-medical, preclinical, and clinical studies; and horizontal within each division, as between anatomy, physiology, and biochemistry, or between preliminary medicine, surgery, and pathology. Much of the factual material with which the present curriculum is weighted should be postponed to the stage of postgraduate education, when the doctor has decided on the career he will choose in the wide field of medicine. In emphasizing the importance of postgraduate studies, when the student has gained some practical familiarity with his material, and when his studies are inspired by the incentive of strong interest, the committee is in line with Sir Richard Livingstone, who has called this the vital principle of adult education.<sup>2</sup> Finally the committee emphasizes that medical education as we see it to-day is formed by the convergence of two streams: the one rising from the medical schools founded in the hospitals, the other from the universities; the one vocational, the other educational: the one representing apprenticeship, and the other academic study. The waters of both these tributaries are needed to maintain a high level of medical education, and in the future we shall probably gain a clearer conception of the contributions that can be made by the part-time clinical teacher with his experience of

<sup>1</sup> Pearce, I. H., and Crocker, L. H., *The Peckham Experiment*, London, 1941.

<sup>2</sup> Livingstone, R., *The Future in Education*, Cambridge, 1941.

practice, and the whole-time clinical teacher with his opportunity for organized teaching and research. While the student is untrained in clinical methods and clinical science, it is wasteful and confusing to put him to work in a ward where the main preoccupation is the treatment of the sick and where the examples of disease presented to him are complex and unrelated. Only the senior student has the equipment to profit by this kind of experience and teaching. Both the introductory clinical course and the first ward-l clerkships must take the form of organized teaching in which cases suitable for progressive instruction are taken from a pool and in which clinical studies are correlated with preclinical studies and pathology. At the end of his undergraduate clinical course, which should be contained within three years as at present, the duty of the examiners will be to ensure that the student has learnt methods and principles—that he has, in other words, been educated—and on this examination the student will obtain his degree or medical qualification. It will still be necessary to ensure that he is safe to practise, and to meet this need the committee recommends a compulsory year of paid resident house appointments in recognized hospitals, at the end of which the student would be examined for his practical or vocational ability and would receive his licence to practise independently.

There is much in this interesting report which we have not space to consider now. It is important to point out that it means a great increase in the routine duties of teachers, preclinical and clinical, whole-time and part-time, all of whom must be more adequately paid than in the past. Reforms in medical education will come at a time when the medical schools are also playing their part in the postgraduate education of the young doctors now in the armed Forces. Selection of students, co-ordination of studies, teaching by the seminar and the tutorial method, organization and working up of cases for progressive instruction in clinical science—all these are time-consuming. Most of our standard textbooks must go on the reference shelf, where they properly belong, and new textbooks must be written and practical courses prepared which are directed to the study of method and principle. The techniques of the instructional film and the synthetic training of the Services must be incorporated in our teaching. In all this it seems to us peculiarly important to safeguard the position of the whole-time clinical teacher, on whom the work of reorganizing the approach to clinical study will chiefly fall. The preclinical teacher has the inspiration of his work. The part-time clinical teacher has the satisfaction of his practice and the associations and social prestige it brings him. Too often the whole-time clinical teacher, with his continual responsibility for care of patients, administration, and teaching, becomes degraded to the level of a hack-tutor, for whom "To-morrow and to-morrow and to-morrow. Creeps in this petty pace from day to day." The stimulating atmosphere of our teaching hospitals has depended on a blending of altruism and individual enterprise, of practice and research. Teaching, to be inspired, must be a part-time occupation which is sustained by practice or by research. For the whole-time clinical teacher this means daily leisure for study and research, the long vacation and the sabbatical year, and we should like to have seen these points rather more sharply made in the present report.

## METHYL ALCOHOL POISONING

Among the unsolved problems of the entity known as methyl alcohol poisoning the actual toxic mechanism and the selective incidence of amblyopia have hitherto taken first place. It has long been known that methyl alcohol is a comparatively weak narcotic but a strong cumulative metabolic poison, and that it produces an acidosis; but the source and nature of the acidosis have never been completely explained. Nor has it been decided whether the amblyopia bears any direct relation to the acidosis, or why the toxic action should be selectively exerted upon either the optic nerve or the ganglion cells of the retina. Answers to some of these questions have now been provided by an investigation<sup>1</sup> of 16 cases of methyl alcohol poisoning, and suggestions for treatment are based on the knowledge obtained. The symptoms in these cases undoubtedly resembled the clinical manifestations of acidosis—anorexia, nausea, vomiting, dyspnoea, drowsiness, and coma—and their severity was commensurate with the fall in the alkali reserve, which was 9 vols. per cent. in a very acute case as compared with 33.8 in a case with only mild general disturbance. The degree of amblyopia also appeared to depend on the degree and duration of the acidosis. On the basis of these facts and the actual demonstration in two cases of an increase in the lactic acid concentration of the blood, a hypothesis of the true nature of the acidosis is advanced which embodies some of the conflicting elements of the long controversy on formic acid versus formaldehyde as the specifically harmful decomposition product of methyl alcohol. It is suggested that the factor primarily responsible for the acidosis is formic acid, which enters into a complex compound with the iron of the respiratory enzyme, thus inhibiting oxidation and causing an increase of lactic acid. Correlation between the degree of acidosis and the severity of amblyopia is explained by the high consumption of oxygen by the retina (demonstrated by Warburg) and its consequently high susceptibility to defective oxygenation, this being followed by degenerative changes in the retinal cells. Since exposure to strong light increases the call on oxidation, this might be expected—as was indeed found to be the case—to increase the severity of the amblyopia. The secondary later deterioration of vision characteristic of methyl alcohol poisoning is attributed to subsequent atrophy of severely injured retinal blood vessels.

A rather surprising feature of the course of the poisoning in some of the cases was the favourable action of ethyl alcohol. Those patients who had drunk large quantities of port, gin, or beer either before or after the methyl alcohol showed no permanent ill effects. This, it is suggested, is due to the capacity of ethyl alcohol to displace methyl alcohol from its intracellular attachments, thereby checking its oxidation to formic acid. The heroic recommendation that ethyl alcohol shall be drunk repeatedly during the first few days after the consumption of much methyl alcohol is therefore included in the treatment advised. Other measures include the rapid correction of acidosis by intravenous injection of isotonic (1.3%) solution of sodium bicarbonate; liberal flushing with fluid; protection from exposure to light; and avoidance of all stimulants of metabolism, such as exercise, hot baths, and thyroid extract.

Prof. E. D. Adrian, O.M., F.R.S., will give the Bertram Louis Abrahams Lecture at the Royal College of Physicians of London on Thursday, June 8, at 4.30 p.m. Subject: "Localization in the Cerebrum and Cerebellum."

## SOME IMPRESSIONS OF SLOW STARVATION IN CHINA

BY

H. T. LAYCOCK, F.R.C.S.

The clinical picture described below became painfully familiar during a little more than a year (Oct., 1942, to Nov., 1943) spent in medical work in South Kwangtung, China. These notes are based on observation of hundreds of starving people attending at an out-patient clinic, seen scavenging in the streets, lying dead or dying on the sides of country roads, and visited in a large camp for refugees. The syndrome exhibited by these people was very uniform, and as it added some details to the usual textbook account of "wet beriberi" I thought a description of it might be worth recording.

### Japanese Technique of "Repatriation"

More than 90% of the cases were refugees who had come, in some cases voluntarily and in others against their will, from occupied to "free" China. The remainder were nearly all Chinese soldiers, many of them as a matter of fact recently recruited from among the refugees. The voluntary refugees, finding life under the Japanese intolerable, had migrated to seek their fortune inland. Unfortunately many of them had been left destitute by robbers.

The involuntary refugees were what the Japanese call "repatriates." In spite of glowing descriptions in their newspapers the Japanese technique of repatriation, as applied to the Chinese, is apparently as follows. Without warning some hundreds of harmless pedestrians, hawkers, and beggars are rounded up in the streets of an occupied city. There is certainly a tendency to choose the less desirable elements in the community, but this choice is by no means a careful one. The victims, of all ages and both sexes, are then systematically starved in one of the worst sort of concentration camps. The daily ration consists of rice gruel cooked with bicarbonate of soda (in order to economize on firewood) which is served without salt, flavouring, or other addition. It would seem possible that the constant adding of soda to the food in this way might produce a chronic alkalosis with renal damage of significance in relation to subsequent oedema. In many cases these people have told me that they were transferred from a normal home life, where the diet was adequate if not abundant, to a squalid and pestilential camp, where they were slowly starved and denied all medical attention and where the death rate was enormous.

From the camp victims considered sufficiently weakened are transported in overcrowded junks to the coast of free China, where those that have not died on the way are left, totally destitute, to their own resources—to the intense annoyance of the local residents. The ones who are too weak to walk remain where they are landed until they starve. Many of them try to prolong their sufferings by consuming inedible or semi-edible substances. I have been shown hard woody roots and have been told that after prolonged soaking these can be cooked into something that can be swallowed. I have also seen a dark green powder, prepared by drying and pounding certain leaves, and have been assured that it can be used as a substitute for flour. The refugees also steal and eat unripe rice, a crime for which the penalty is death. In our local refugee camp the heaps of banana skins and mango stones, scavenged in the streets for use as food, give eloquent witness to the intensity of their hunger. I am also convinced from the evidence of eye-witnesses that the flesh cut from corpses is used as food. Why more of these unfortunate people do not give up the unequal struggle and find an easy way out in suicide I do not know. Certainly very few of them seem to make the attempt. Instead they struggle inland with a frantic desperation of which one is forcibly reminded by seeing the deep ulcers on the buttocks of people too weak to walk who have struggled across the country in a sitting posture.

### Hunger Oedema and Ulceration

Clinically the most conspicuous feature in these cases was the widespread oedema, which first appeared on the dorsal aspect of the feet. These became more and more swollen until the skin was tightly stretched and assumed a peculiar bluish transparency. Later it actually gave way under tension, and multiple fissures appeared from which there was usually a copious serous discharge. These fissures were readily infected and deep gangrenous ulcers arose in them in neglected cases. Ulcers on the dorsal aspect of the feet were a common and characteristic finding. Often they arose spontaneously, but many were produced artificially by misguided attempts to reduce the oedema with filthy and irritant applications. The victim well realized that oedema of the feet was the first of a series

of most unpleasant symptoms. One soldier had applied a dark paste made from pounded leaves to the upper surface of one foot to reduce the swelling. I do not know what the chemical composition of this paste was; its effect was like that of strong caustic potash. There was an area 6 in. by 3½ in. covering the foot dorsally and extending above the malleoli. This was greenish white in colour and sodden like damp blotting-paper. In a few days it separated as a thick slough, leaving a deep and painful ulcer. The malleoli in this and similar cases retained islands of skin over them, presumably because the application had been put on thinly over the bony points. The man said he realized that swelling of the feet was a serious condition and he had used a herbalist's remedy. I was surprised to find that he expected an ulcer to form, under the delusion that this was part of the cure. However, he found the process so painful that he vowed he would never use the method again or recommend it to his friends. On a normal diet and with the daily use of antiseptic dressings this ulcer healed so rapidly that the skin grafting which I at first thought of seemed superfluous.

Another soldier had bilateral ulcers produced in the same way, but here there was a gangrenous infection, the edges of the ulcers were undermined and purple in colour, and there were hemorrhagic blisters higher up the legs. I felt obliged to do an amputation, but the patient did not survive. These dorsal foot ulcers commonly involve the extensor tendons, which are seen running across them as white sloughing strands. When the tendons have been involved in this way, and healing has occurred later, there is usually an extensor contracture, involving particularly the fourth and fifth toes, with the production of calcaneus and valgus deformities which are sometimes severe and very crippling.

Further up the leg the oedema distends the skin, and over the lower leg especially this has often a high glaze upon it. The disappearance of this glazed look was the first sign that oedema was subsiding. The whole limb up to the groin was sometimes grossly oedematous, but often the oedema stopped abruptly above the lower third of the thigh. I saw cases in which oedema in the popliteal fossae prevented extension of the knees and the patient was obliged to walk with the knees flexed. Under treatment the oedema disappeared from above downwards, persisting longest in the feet, and when it had gone the emaciation was often so extreme that whole groups of muscles seemed to have disappeared.

The external genitalia were early affected by the oedema, a symptom which seems to upset Chinese patients very much. A distressing eczema of the scrotum was also very common. There was pitting oedema over the trunk and in the arms, it was the backs of the hands that were earliest and most affected.

The face was often grossly oedematous, with the eyes completely closed. There was a strong tendency for the oedema to shift with gravity, and the whole appearance of the face would alter over night. Particularly in cases where the oedema had partially subsided the whole face seemed to sag, the swelling disappearing last from the lower part of the cheeks. The corners of the mouth drooped and unnatural creases appeared round the eyes and radiated from the alae nasi. These creases did not so much add expression to the face, which was toneless and gloomy, but rather added a bizarre touch which was quite repulsive.

The facies was further altered by the presence of dark pigmentation not strictly limited, as in pellagra, to areas exposed to the sun. The hair was dry and disorderly with a tendency to stand on end. The loss of the normal silky lustre of Chinese hair in someone who was seen before and after several months of slow starvation was quite striking. The tongue was variable, often clean and moist. In a minority of cases it was glazed and vermillion in colour. Oral sepsis was common and I often saw a thrush-like lesion on the soft palate.

### Abdominal and other Complications

Scurvy was conspicuous by its absence. Even where oedema was extreme serous effusions were quite infrequent, though I saw a few cases complicated by ascites. The musculature of the abdominal wall was toneless, and flaccid distension was the rule. Unless there was some marked oedema of the skin over the abdomen visible peristalsis, of small intestinal type, was a common clinical finding. The abdominal distension was often associated with a small umbilical hernia or with a "weeping" eczematous lesion of the umbilicus. There was very commonly watery diarrhoea and a tendency to pass any food taken unaltered in the stools. It was difficult to persuade many of these cases to eat, because they seemed to have lost all interest in food. They were very prone to contract bacillary dysentery, and any such bowel infection in a convalescent case usually caused a relapse of the oedema.

Many of them complained of cough and produced a white frothy sputum, which I took to be due to oedema of the lungs. Other pulmonary complications were uncommon. The heart was sometimes moderately enlarged and the heart sounds diminished in volume and with a tendency to "tick-tack" rhythm, but I saw so few cases

with the signs of congestive failure that I felt convinced cardiac failure could have little to do with causing the oedema.

A more or less severe secondary anaemia was invariably present and the response of this to simple iron therapy was very rapid.

As regards the nervous system I saw a few cases only of typical "dry" beriberi, but in the oedematous cases—i.e., the vast majority—nervous symptoms were not at all common. Most cases complained of "numbness" in the feet and legs, but by this they usually meant the altered sensation due to the skin being stretched by oedema. Anaesthesia to pin-prick, paraesthesiae, and paralysis were conspicuously uncommon.

A great many patients complained of night-blindness, but this was a common complaint also among people in the district, particularly soldiers, with no other symptoms. Amenorrhoea and sterility were extremely common in both refugees and village women in the district, and seemed to be invariably present in the oedematous cases.

The mental state was one of depression, which varied with the degree of oedema. This was particularly noticeable in children, who would lie curled up all day and so motionless that the oedematous skin acquired a deep impression from the straw mat beneath it. As the oedema subsided they became mentally alert again. The adult patient usually came with the fixed idea that he or she must be admitted to hospital, and would repeat the same request over and over again with tears dripping from the cheeks. Cerebration was slow and the extraction of a history very tedious. As mentioned earlier, suicide as a way of escape was quite uncommon.

The clinical course was marked by a strong tendency to relapse. The slightest intercurrent infection, usually a more or less severe enteritis, would be accompanied by a disappointing reappearance of the oedema. An alteration in the weather would cause surprising changes, and after a spell of hot damp weather was over most of the cases improved very rapidly.

#### Response to Treatment

Treatment consisted in giving a diet with a high protein content, liver, meat, fish, and soya-bean derivatives. We gave rice polishings in the form of a cake made with flour and a little baking powder and fried in peanut oil. These were very popular, especially with the children. Vitamins were given in the form of teleostol capsules and thiamine hydrochloride injections, but I didn't have enough to use them freely.

In their response to treatment patients fell into two groups. In one there was a rapid uncomplicated recovery; in the other, in which there was generally persistent albuminuria, progress was slow and laborious with disappointing relapses and a tendency to die suddenly and unexpectedly.

## MEDICAL EDUCATION

### ROYAL COLLEGE OF PHYSICIANS' REPORT

The Report on Medical Education of the Planning Committee of the Royal College of Physicians was published on May 2, and is the subject of a leader in our present issue. Limited space allows us to summarize only the main points in this highly important document, which should be carefully read by all those interested in the subject. It is divided into two parts, the first dealing with the recruitment and selection of medical students, and the second with the training of the doctor, considered under these headings: the medical curriculum as a whole; medical education; the preclinical period; the clinical period.

#### Selection of Students

In the making of a good doctor, the report observes, the intellectual and personal qualities of the student are as important as the education to which he is submitted. At present too few candidates enter medicine. An increase in the number would widen the field of selection. The doctor's way of life and his rewards must be such as to attract suitable candidates. To overcome financial obstacles which restrict the entry into medicine, the committee favours making university education entirely free, not only in medicine but in all other faculties. Free university education would bring more men into medicine and make selection easier. In assessing the suitability of a candidate two things to be taken into account are academic record and character and personality: "In the case of the doctor character is in general not less important than ability."

#### Training of a Doctor

Present defects in the average medical graduate to be attributed chiefly to training are lack of curiosity and initiative, undeveloped powers of observation, poor ability to arrange and interpret facts, lack of precision in the use of words. The training may be technically satisfactory, but is unsatisfactory as an education: "This is a matter of very great importance." The committee has therefore aimed to discover how to improve the medical course as an education without detracting from its efficiency as a technical training.

#### Curriculum as a Whole

"No other profession demands an education so complex, so rigid, and of such long duration." The curriculum grows in content, and rarely is anything taken from it. While the general structure of the curriculum is sound, and the length of training cannot be reduced, remedies must be sought under three headings: improved co-ordination, elimination of unnecessary detail, and distinction between the requirements of undergraduate and of postgraduate education.

At present there is little co-operation between the teachers of the premedical, preclinical, and clinical stages, and little between teachers of the same stage—for example, between chemist, physicist, and biologist. The committee quotes Karl Pearson's words that "the true aim of the teacher should be to impart an appreciation of method, and not a knowledge of facts." A difficulty in planning the curriculum is to cater for the variety of careers a student may ultimately follow. If all needs are to be met, there is little of organized knowledge that can safely be omitted from the curriculum. A fundamental reform, therefore, is to recognize that medical education should fall into two categories: (1) undergraduate and unspecialized, providing for doctors as a whole; and (2) postgraduate, providing for special needs. At present the curriculum to some extent combines the two. The committee observes that organized postgraduate education is as yet in its infancy. In discussing teachers and teaching methods it pleads for a wider adoption of the tutorial method, which "has long been regarded as a most valuable educational method at Oxford and Cambridge, and is becoming increasingly popular as the seminar system in the United States of America."

#### Premedical Education

Under this heading the committee stresses the importance of a general education, voicing the criticism made that specialization at school "may diminish interest in other activities of the mind, such as the history, art, and literature of ancient and modern times and of all countries." The committee believes that the student should not take the First M.B. examination before entering the university. To take it at school debars him from that general education which the committee regards as of the first importance for a doctor. It agrees that the teaching of the basic sciences should begin at school, and it believes that in the university course of general science stress should be laid upon physical chemistry and organic chemistry, and that in the biology course more stress should be laid on such biological principles as the theory of evolution, adaptation to environment, and genetics, and less time should be given to the memorizing of details of animal types.

#### Preclinical Period

The committee agrees with many others who have considered this matter that "anatomy should be more closely related to the living, and not chiefly a study of the dead." It advocates the omission of much detailed learning of topographical anatomy. It advocates what it terms the "new anatomy," and observes that this will require new dissecting manuals and new textbooks. "Physiology," it is observed, "is the natural medium for teaching the essential methods of biological science—namely, the methods of accurate measurement and experimental analysis of the factors concerned in biological phenomena." If the supply of teachers of anatomy, physiology, and biochemistry is to be maintained at a high level, then they must be paid better salaries. In urging co-ordination, the committee remarks that in one term the student may learn the structure of the alimentary tract from the anatomist, in



a second the digestion of foods from the biochemist, and in a third the movements and secretions of the gut from a physiologist. The student should be introduced to methods of examining the normal body during the pre-clinical period.

### Clinical Period

"Medical education is directed towards two objectives which may be termed educational and vocational." In the former the student is taught method, so that he can collect, analyse, and interpret facts for himself, and observe and understand what he observes. In the latter he is given such knowledge as will enable him to practise medicine on his own account. As a medical graduate on qualifying can at present assume full responsibility for taking charge of patients, then in the public interest the State must insist "that every student before qualification should acquire a basic knowledge of all branches of medicine and surgery, including the various specialties, as well as of medical jurisprudence, public health, and hygiene." This knowledge has to be acquired in three years. The absorption of "an enormous mass of facts" does not allow the student to give thought to the scientific principles underlying medicine. The predominating factor in this dilemma is the need to protect the public from the ignorance of the newly qualified; but the emphasis is on factual knowledge, and unless the student is grounded in method and principle he cannot make full use of experience in the development of judgment—"and it is on judgment that his value to the public as a doctor will chiefly depend."

### COMPULSORY RESIDENCE

The committee, therefore, proposes to divide the clinical period into two phases: (1) the undergraduate period proper, of three years, and (2) a compulsory resident year—the former to be spent mostly in training in method and principles, with an examination at the end to test the student's grasp of these; and the latter to consist of a series of house appointments. The content of the course is to be based on requirements common to men who will become general practitioners, consultant-specialists, pathologists, research workers, and administrators; the special requirements of the several groups will be met by postgraduate rather than by undergraduate education. Therefore much that is now required in the undergraduate period can be omitted—for example, details of complicated diagnostic procedures, rare diseases, specialized treatment such as radiotherapy. The stress in the undergraduate period is to be on method, "for method is a more lasting acquisition than is fact, and without method a man is lost when he meets an unfamiliar situation, as he is ultimately bound to meet it away from his teacher's guidance." The second object should be the teaching of principle. The two should be used to show the student that the scientific method can be used in clinical study, and "that there is such a thing as clinical science."

### IMPORTANCE OF PATHOLOGY

The present method—or lack of method—of introducing the student into clinical work often bewilders him. The principles of pathology and bacteriology form a necessary introduction to clinical work. They should be illustrated by clinical material: for example, a study of inflammation would be illustrated by a case of conjunctivitis or cellulitis. "Seeing clinical material first in this light, the student would think of illness from the beginning in terms of disease processes." Another part of the introductory course should consist of lecture-demonstrations and practical exercises in the methods of history-taking and clinical examination. The student starting clinical work would begin with a three-month course in which the morning would be given to "lectures, demonstrations, and practical classes devoted to the principles of general pathology, the afternoons to lecture-demonstrations on clinical material designed to illustrate the course of pathology, and to introduce the student to some of the simpler disturbances of structure and function." After this he would begin the first ward appointment in general medicine or surgery, and in this teaching should be planned and not be governed by the fact that unrelated cases happen to be in adjacent beds.

Emphasis is laid once more on the problem of co-ordination, not only between the clinical and preclinical departments, but

also of the several divisions of clinical teaching. "The student's understanding of the essence of disease is increasingly handicapped by lack of co-ordination between the teachers who present the same disease-problems from the separate viewpoints of medicine and surgery; of such diseases peptic ulcer is a good example." Combined teaching, in which teachers of different specialties meet together to present their different views in front of the student, is looked on as one of the most valuable measures for overcoming incoordination in teaching. This benefits not only the student but also the teachers, who can then learn something of each other's points of view. The difficulty is that the clinical teacher at the moment has little time to spare. The department of pathology, it is observed, has "a unique opportunity for drawing together colleagues who . . . are tending to drift apart." Pathology should occupy a position of special importance in the undergraduate curriculum, and it is an essential part of the committee's proposal that the principles of pathology should form a major part of the introductory course of clinical work, the teaching to be confined mostly to principles.

### SPECIAL SUBJECTS

Special consideration is given to the place of psychological medicine, of social medicine, and of paediatrics in the curriculum. Of the first, it is observed, "We wish to awaken and to maintain the student's interest in matters of the mind from the beginning of his medical course"; of the second, "It should be the aim of all physicians and surgeons to permeate their teaching with an interest in social medicine"; and of the third, "The committee is agreed that paediatrics should be regarded as a major clinical subject on a par with obstetrics and gynaecology, and should occupy the whole time of the student for three months."

### Paying for Brains

After discussing ways of arranging for the compulsory year of residence, the committee considers the conditions of work and selection of clinical teachers. It recognizes that its proposals would make increased demands on teachers already heavily burdened. It recommends that clinical teachers should be paid for their teaching and hospital work. It deplores the falling off in the number and quality of young men specializing in pathology, "due probably to the more attractive remuneration and conditions of work offered by other careers."

As so much is implied by one paragraph under the heading of "The Place of the Teaching Hospital in an Organized Medical Service" we quote it in full:

"In the past, teaching hospitals have been institutions founded and financed for the treatment of the sick. Teaching and research have been, as it were, sidelines to which relatively small parts of the hospital's space, equipment, and budget have been devoted. It will already be apparent from the recommendations made, that the committee considers that the position of the teaching hospitals as centres of education and of research requires greater recognition and a much increased contribution from the public purse. For the campaign against disease is ultimately dependent on the progress of medical knowledge and on the efficiency of the medical profession, both of them deriving largely from the teaching hospitals."

It is difficult in this short space to pay full justice to what appears to us to be one of the most valuable reports issued by the Royal College of Physicians for some time. It reads as if it has been drafted by one pen, and to the wielder of this the profession at large is under a deep obligation.

During 1943 the Trustees of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation received eighteen applications for grants, thirteen of which came from the United States, the other five coming from five different countries in Europe, Asia, North and South America. In the twenty years of its existence the Foundation has made 481 grants, which have been distributed to scientists throughout the world. Researches are favoured that are directed towards the solution of problems in medicine and surgery, or in branches of science bearing on medicine and surgery. Information about the grants may be had from Dr. Joseph C. Aub, Massachusetts General Hospital, Fruit Street, Boston, Massachusetts.

## Correspondence

### Cerebral Malaria

SIR.—We read with interest the article in the Dec. 25 issue by Dr. I. B. Sneddon called "A Fatal Case of Cerebral Malaria." Each year over 600 cases of malaria are treated in in-patients in this hospital. The scheme of treatment for the cerebral cases—reached by a method of trial and error over a number of years—is now the following:

On confirmation of diagnosis by highly positive M.P. film, clear C.S.F. and a low W.B.C., an intramuscular injection of quinine is immediately given. If the patient is very collapsed a small intravenous saline is sometimes given at this time, but never intravenous quinine. Four to six hours later a small intravenous injection of quinine is given: 3 to 6 gr. is ample. Adrenaline is given at all 5 given intramuscularly just prior to the intravenous quinine. Another small intravenous quinine injection can be given after a further four to six hours up to three such injections or the recovery of the patient. In December of this year we had six cerebral malaria patients. Only one died an infant of 13 years who had no intravenous injections.

We have found that large doses of intravenous quinine in cerebral cases in invariably followed by death. These cases all show a highly positive film. We have no copy of the 1942 edition of Manson-Bahr referred to by Dr. Sneddon, but in the 1940 edition, page 114, the following may be found: "The amount of toxin liberated by the rapid destruction of the parasites after intravenous injection [of quinine] may be sufficient completely to paralyse the cardiac mechanism, and death may rapidly ensue." In our minds there is no doubt of the truth of this. He goes on to advise intramuscular quinine followed by quinine intravenously.

What the "toxin" is, so far as we know, no one has ever found out. The common finding of jaundice in such cases suggests that it is rather the products of the burst-up red cells than something exuded by the parasites themselves. However, both of these factors may contribute to the "toxin," which seems to give rise to a form of protein shock—"autoprotein shock," if we may use the phrase.—We are, etc.,

G. B. YOUNG.

C. J. A. MACADEN.

Jalna, Deccan, India

### Kala-azar in an Adult contracted in Malta

SIR.—In the *Journal* of April 8 (p. 492) Wing Cmdr. Lipscomb and Squad. 1 dr. Gibson state: "We can trace only four recorded cases in adults whose infection cannot have occurred elsewhere than in Malta" in 1913-14, 1918, 1933, and 1934. In 1917, while in charge of the Medical Division of Valetta Military Hospital, Malta, I treated a case of kala-azar undoubtedly contracted in Malta, and heard of two others similarly contracted. As I left my notes in Malta and am quoting from memory I can only give the salient points, which were deeply impressed on my mind, and are as follows:

In the summer of 1917 a draft of No. 1 Malta Company, R.A.M.C., all British soldiers, paraded for inspection before proceeding to Salonika. At the conclusion of the parade it was remarked that Sergeant "G." was not only the smartest soldier on parade but the fittest. The draft was unavoidably delayed in the island owing to U boat activities, and some weeks later—possibly a month or six weeks—I was called to see this N.C.O., who was feeling ill, sweating, and had lost weight. On admission he looked ill, wasted, having lost 2 st. in weight, and from being a ruddy complexioned man had become sallow in appearance. On examination the only physical sign found was an enlarged spleen.

Colonel Sir Archibald Garrod, consulting physician to the Malta Command, who visited the hospital twice a week, saw him at his next visit and suggested to me that it might be a case of kala-azar. I pointed out that this N.C.O. had come straight from England two years previously and had never left the island since. Sir Archibald Garrod said that was no bar to contracting kala-azar, as he had already seen two soldiers who had contracted the disease in the island. The similarity of their symptoms and appearance plus the splenic enlargement suggested the tentative diagnosis of kala-azar. Acting on his advice splenic puncture was at once performed and Leishman-Donovan bodies demonstrated within a very short time of the patient coming under observation. He was treated by intra-

venous antimony injections; so far as I remember the solution was 1% tartar emetic. He always vomited before the needle was withdrawn from the vein, except on three occasions when he developed a severe irritation in one tonsil. He made an uninterrupted recovery, during the course of which he was visited by many people, including the late Lord Methuen, Governor, and Sir Thomas Yarr, D.M.S.

He corresponded with me for several years, and as an instance of the completeness of the cure told me that while on leave at his father's farm in England dived into a river and rescued a drowning sheep. Later in the war the ship he was in was torpedoed, and though he was in the water and boat for some time suffered no ill effects from the experience. I last heard from him several years ago when he was farming in Ladysmith and happily married.

It is interesting to record that shortly after this case I also treated a man of the Egyptian Labour Corps for bilharziasis in a similar manner with satisfactory result, the first time this treatment had been employed for this condition in Malta.

My own case of kala-azar was undoubtedly contracted in Malta, and Sir Archibald Garrod was not the type of man to make a statement like the above without a complete investigation. I believe I am right in saying that his opinion was that kala-azar was of more common occurrence in British adults in Malta than was generally realized. At any rate that is the impression left on my mind after twenty-seven years.—I am, etc.,

Southsea

R. J. LYTLE.

### Sickness Records of Hospital Nurses

SIR.—Dr. Joyce Wright's article (April 29, p. 585) on the sickness records of nurses in hospitals presented many interesting findings, but it would be instructive to compare the sickness records of hospital nurses who were respectively resident and non-resident in hospitals. Such a comparison might throw some light on the vexed question whether nurses should be accommodated in hospital or should be encouraged to live at home or in lodgings. In the hope that other hospitals may record their experiences where they have been similarly staffed, I have set out our experience in this hospital for the year 1943.

	No. of Nurses Employed	No. of Illness Absences	Days lost from Illness
Resident	124	97	1,534
Non-resident	154	163	3,300

The longest absence for a resident was 178 days; and the longest absence for a non-resident was 160 days. The hospital is situated in the country at a distance of 2 to 4 miles from centres of population where the non-resident nurses have their homes, lodgings, or billets. The non-resident nurses were under the care of doctors outside the hospital for the most part, though in a few cases treatment had to be given in the hospital.

The age groups of the two classes of nurses were not examined closely, but were known to be similar. The nature of the illnesses was also similar in the two groups to one another and to that given in Dr. Wright's article. The hours of duty for all non-residents amounted to 48 per week, whereas residents on the whole worked rather longer hours, usually about 52.

From these figures it would appear that residence has the advantage in respect of health; they are, of course, too small by themselves to establish a conclusion with certainty.—I am, etc.,

Clatterbridge General Hospital, Wirral.

D. WILKIE.

### Tuberculin Patch Test

SIR.—I should like to confirm Prof. Tytler's observations with regard to the efficacy of his tuberculin jelly. Some time ago he very kindly sent me a supply of this tuberculin jelly, which I used on a series of some 40 cases with (a) Mantoux test 1 in 1,000 controls, and (b) commercial patch test controls. I found that the results tallied exactly with those of the Mantoux test, and, so far as the commercial patch-test controls were concerned, the positive reactions with the jelly were stronger and much more reliable. In view of its practical importance it is to be hoped that Prof. Tytler's formula will soon be available for general use.—I am, etc.,

London, W.1.

PHILIP ELLMAN.

## SEROLOGICAL NOTES, NO. 1

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Existing stocks of these packings should be used in conformity with current recommendations, i.e., the contents of at least three 1000 unit ampoules, or an equivalent amount from a rubber-capped bottle, should be given as a prophylactic dose.

\* Monthly Bulletin of the Ministry of Health and the Emergency Public Health Laboratory Service, Vol. 2, October, 1943.

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### Cost of Living and the Nation's Health

SIR.—As doctors we are not as a rule concerned with the Budget proposals of the Chancellor of the Exchequer, except in so far as our own pockets may be affected and we may desire to express laymen's opinions on financial matters.

There is, however, one aspect of Sir John Anderson's Budget speech with which I venture to suggest, doctors, and particularly those interested in social medicine, are very directly concerned. The Chancellor stated (*Times* report, April 26) "that having regard to the higher domestic costs of production and also to import costs, he felt that for the ensuing year a range for the cost-of-living index of 30 to 35% over pre-war should be substituted for the 25 to 30% laid down by Sir Kingsley Wood in 1941." He also stated that "some part of the explanation [i.e., of increased subsidies] was to be found in the growing cost of imports, which affected particularly the food components of the index." If this is correct, it would appear clear that the main increase to be permitted in the cost of living will be accounted for by a rise in the price of foods. The chief foods to get subsidies are bread and flour, meat, potatoes, sugar, milk, cheese, and bacon, which form the foundation of our diet, and which last year received between them subsidies amounting to £149,700,000.

It has been estimated that a rise in the cost-of-living figure from the present index of 29% above pre-war level to the proposed 35% would represent an extra charge of £48,000,000, which would be thrown upon consumers, and at the present stage it would appear that the whole of this additional £48,000,000 will presumably be spent by the public on foods only. This is an average of over £1 per head per annum, counting every man, woman, child, and babe-in-arms.

Now it is generally agreed that the health of the country is remarkably good, and perhaps much better than many of us might have expected for the fifth year of the war. Not only has it remained good but new low records have been established in certain directions—e.g., maternal and infant mortality rates and standardized death rates among civilians, both male and female. In spite of supply difficulties it is doubtful whether very large sections of the population have ever been so well fed before as they are now, and it would be difficult not to ascribe some part of this remarkable wartime position as being due to the maintenance or improvement of the people's dietary in its essentials. In part it is no doubt due to the full employment with consequent higher family incomes, but full credit must also be given to the Ministry of Food and its scientific advisers for the job they have carried out of ensuring the more even distribution at reasonable prices of whatever foodstuffs have been made available, as well as for their schemes of extra supplies of special foods and food supplements for particular classes, either free or at greatly reduced prices—such as milk, cod-liver oil, and orange juice for mothers and children.

The maintenance or improvement of general nutritional standards is reflected in favourable health reports from all parts of the country, and from a medical point of view it would be deplorable that, at this stage of our knowledge, any steps should consciously be taken which may check and which may even in the long run eventually lead to a deterioration of the existing nutritional level. Sir John Boyd Orr and others have shown that the lower the income level the higher is the proportion of income which is spent on purchasing food. Any permitted increase in the cost-of-living index through a rise in the cost of essential foods will fall most heavily upon those who are least able to carry such an increase, and who will inevitably react by a reduction in either the quantity or quality of foods purchased, since the first-class proteins and protective foodstuffs are the most expensive.

Such is not the road to an improvement in the national health, but even on strictly utilitarian and economic grounds national efficiency in post-war rebuilding can only be assisted and not hindered by a people whose physical condition is at the maximum that can be attained through good nutrition. This point of view is also in full accordance with Principle A of the statement of Principles approved by the B.M.A., which says, "The health of the people depends primarily upon the social and environmental conditions under which they live and work. . . . upon nutritional standards. . . . The improvement

and extension of measures to satisfy these needs should precede or accompany any future organization of medical services."

I trust, therefore, that doctors will very carefully consider the possible health repercussions of this aspect of Budget policy.—I am, etc.,

Public Health Department, Islington.

V. FREEMAN.

## Obituary

### WILLIAM TURNER, M.S., F.R.C.S.

We regret to announce that Mr. William Turner, consulting surgeon to Westminster Hospital, died on April 30 in the hospital which he had served so long and so faithfully.

The son of Frederic Turner of Nizels, near Sevenoaks, he was born on Jan. 25, 1870, and from King's College School, London, went on to study medicine at King's College Hospital, where he was gold medallist of his year and won the Sambrooke Exhibition and first- and second-year scholarships. After qualifying in 1893 he served as house-surgeon and house-physician at King's. He graduated M.B., B.S. Lond. in 1895, winning a scholarship and gold medal, took the F.R.C.S. in the same year, and the M.S. degree in 1898. During the South African War he was surgeon to the Imperial Yeomanry base hospital, Deelfontein, and then medical officer in charge of the Imperial Yeomanry branch hospital, McKenzie's Farm. William Turner had been appointed assistant surgeon to the Westminster Hospital in August, 1897, and later served as senior surgeon for eleven years, retiring under the age limit in 1934, when he was elected consulting surgeon and a vice-president of the hospital. He was also consulting surgeon to the Dreadnought Hospital, Greenwich, the King Edward Memorial Hospital, Ealing, and the Royal Hospital for Diseases of the Chest, City Road. During the last war he was on the à la suite staff of the 4th London General Hospital with the rank of major, R.A.M.C.(T.), and also served on the visiting staffs of the King George Hospital, No. 22 American Red Cross Hospital, and Mrs. Michison's Hospital, Clock House, Chelsea. With his Westminster colleague, Mr. E. Rock Carling, he wrote *Treatment after Operation*, published in 1912. In 1936 he gave the Creasy Memorial Lecture, taking as his subject "The Acute Abdomen." He had been a member of the B.M.A. for 50 years.

#### Mr. ROCK CARLING writes:

I think I was Mr. Turner's first dresser in the out-patient department at Westminster; I have been his colleague for almost 40 years, and never ceased to learn from him. He had an unquenchable enthusiasm for his work and could genuinely feel that every patient might present something of unexampled interest; this lent a stimulus to his teaching that all his students felt. He was a very hard worker. With calls upon his professional services from several hospitals he could always find time for all the business committees of Westminster Hospital and Medical School, and his counsel was always sound. He was a colleague upon whose integrity and generosity one could count with complete confidence. He will be greatly missed.

Dr. ALBERT EDWARD BIRD, who died on April 1 at the age of 76, was a general practitioner in Burnley for 38 years until his retirement. He had been divisional surgeon and lecturer for the St. John Ambulance Association, and during the last war was commandant of the Auxiliary Military Hospital at Burnley. He joined the B.M.A. in 1905, served as honorary secretary of the Burnley Division as far back as 1911, and was later chairman; he had also been chairman of the Local Medical and Panel Committee and attended a number of Panel Conferences in London. He was very popular with his colleagues and greatly esteemed by all who knew him.

Dr. WILBERT GOODCHILD died at Threlkeld, Cumberland, on April 14 at the age of 67. As medical superintendent of Blencathra Sanatorium, Threlkeld was his home and centre of his activities for the past 39 years. He was the son of J. G. Goodchild of the Geological Survey of Scotland. Born in a scientific circle he decided on medicine as a career because the outlook



of any man wishing to devote himself to pure science was restricted. He graduated M.B., Ch.B. at Edinburgh University in 1903, and after a period as resident at Woodburn Sanatorium he was appointed medical superintendent of the projected Cumberland Sanatorium. He took charge of an embryo institution. The doctor's house was a reconstructed farmhouse and steading. From these small beginnings he directed its development to its present state of efficiency. In Edinburgh he came under the influence of Sir Robert Philip, whose methods of treatment became largely Dr. Goodchild's guide in developing his institution. He early realized the importance of occupational therapy, and with his patients and some outside assistance he designed and installed the electric supply for the sanatorium, as well as many other instructional and therapeutic agencies, as, for example, one of the earliest open-air cinematograph rooms. He thus kept himself and the sanatorium in the front rank of progress. Among his patients he was always sympathetic, and many will feel that they have lost their best friend. He was an expert geologist and mineralogist and contributed the mineralogical section to the *Technological and Scientific Dictionary*, equivalent to a condensed survey of the whole field of the crystallography and chemistry of minerals. His hobbies, if they can be so called, were not amusements but serious contributions to science. This applies to his work in the field of archaeology, more especially of the Stone and Bronze Ages. He was also a botanist and had at his home a very complete collection of British ferns and Alpine plants growing under natural conditions. He was visited by many people interested in the various branches of natural history, archaeology, and geology in which he was interested and recognized as an authority. They all received a hospitable welcome from Dr. and Mrs. Goodchild.

J. J. G.

We regret to record the sudden death recently at an early age of Dr. G. MACKERRACHER of Birmingham. George MacKerracher studied medicine at Glasgow, and took the M.B., Ch.B. of the University in 1922. After qualifying he was house-surgeon to the Victoria Infirmary at Glasgow and to the Guest Hospital and Eye Infirmary, Dudley. He subsequently went into general practice in Birmingham. The extra work imposed on MacKerracher as a result of the war threw a very heavy strain on him, which probably contributed to his sudden death. Quiet and unassuming, he represented all that was meant by "family doctor." He was held in high affection and regard by his patients and friends; the funeral service was largely attended by his poorer patients. In the last war he served in the Royal Navy. He leaves a widow and young son.

## Universities and Colleges

### UNIVERSITY OF OXFORD

In a Convocation held on April 27 the following medical degrees were conferred:

B.M. B.Ch. M.F.C. Walker and S. E. M. Bates (*in absentia*)

### UNIVERSITY OF CAMBRIDGE

At a Congregation held on April 28 the following medical degrees were conferred:

M.D.—F. T. G. Prunty, N. Whitaker, H. D. B. Kelly (*in person*); A. J. Daly, S. T. Anning, T. M. Banham, K. Robson (*by proxy*).

M.B., B.Chir.—P. L. Blaxter (*in person*); A. J. Briggs, J. H. M. Tilley, A. N. Exton-Smith, W. R. Probert, M. Ellis (*by proxy*).

### UNIVERSITY OF LONDON

Prof. D. Hughes Parry has been appointed a representative of the University on the Board of Management of the London School of Hygiene until Dec. 31, 1945, in place of Sir Girling Ball (resigned).

The Regulations in Medicine for Internal Students have been amended by the inclusion of the following paragraph:

"Students who enter a medical school in October (or January) but are unsuccessful at the first examination for medical degrees for external students in the following December (or July) will, subject to the approval of the authorities of their medical school, be admitted to the first examination for medical degrees as internal students in July (or December) provided they have attended the full course of study in all the subjects of the examination throughout the preceding three terms and have complied with the Regulations in other respects."

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

The following candidates have passed the Primary Fellowship Examination:

D. R. Barnes, I. Bruce, D. B. Feather, G. J. Fraenkel, R. A. Giff, G. Harrison, H. A. McDonald, A. Naylor, L. P. A. Newborne, C. B. Orchard, G. E. Stein

### ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At a quarterly meeting of the Council held on April 29, with the President, Mr. Hardley Holland, in the chair, the Honorary Fellowship of the College was conferred on Sir Joseph Barcroft and Dr. E. Hastings Tweedy, in recognition of their services to obstetrics and gynaecology.

The following were admitted to the Fellowship:

J. H. Blakey, D. W. Currie, J. V. O'Sullivan, J. H. Peel. *In absentia*: H. L. McClure, A. W. Spira.

The following were admitted to the Membership:

John R. C. Boston-Brown, Agnes I. D. Cathcart, Audrey I. French, D. Friedlander, M. M. Garrey, Lilian D. M. Wilson. *In absentia*: A. P. Bernal, J. J. Kearney.

At the annual general meeting of the College, held on April 29, with the President in the chair, the following were elected to Council in place of those retiring by statutory rotation: *Representatives of the Fellows*: John Hewitt, J. E. Stacey, J. M. Wyatt. *Representatives of the Members*: J. H. Dewar, J. A. Stallworthy.

The meeting was followed by the William Blair-Bell Memorial Lecture, delivered by Mr. Hector R. MacLellan, M.D., F.R.F.P.S. Glas., M.R.C.O.G., entitled "Contracted Pelvis in Childbirth."

## Medical News

The Merseyside Group of the Association of Industrial Medical Officers will hold a meeting at Liverpool University, Surgical Theatre, at 4 p.m., on Tuesday, May 16, when Prof. Ryle of Oxford will speak on "Social Medicine, Experiments and Prospects." Members of the profession are invited.

A meeting of the London Association of the Medical Women's Federation will be held in the Common Room of B.M.A. House on Thursday, May 18, at 8 p.m., to discuss the White Paper.

Prof. Alexander Fleming, F.R.S., has accepted the invitation of the Council of the Royal Institute of Public Health and Hygiene to deliver the Hatten Lectures for 1944. His subject will be: "Penicillin—its Discovery, Development, and its Uses in the Field of Medicine and Surgery."

At a meeting of medical members of the British Institute of Radiology to be held on Friday next, May 19, in the Reid-Knox Hall, 32, Welbeck Street, London, W., Mr. H. S. Souttar will give the Mackenzie Davidson Memorial Lecture on "Team Work in the Treatment of Cancer" at 4.30 p.m. At the annual general meeting on Saturday, May 20, Prof. S. Russ will give the Silvanus Thompson Memorial Lecture at 3.15 p.m.

The Faculty of Radiologists announces that the Skinner Lecture on "The Natural History of Disorders of the Reticular Tissue" will be given by Dr. A. H. T. Robb-Smith on Saturday, May 20, at 11 a.m. in the Royal College of Surgeons, Lincoln's Inn Fields, W.C. The lecture is open to all members of the medical profession.

A special meeting of Fellows of the Royal Society of Medicine has been summoned for Tuesday, May 23, at 5 p.m., with the following agenda: (1) Nomination of officers and Council for 1944-5; (2) alteration of regulations regarding visitors' privileges in the Library; and (3) to approve enlargement of the Society's house and the architectural and financial preparations necessary therefor.

The annual general meeting of the Royal Medical Benevolent Fund will be held at the Royal Society of Medicine, 1, Wimpole Street, W., on Thursday, May 25, at 2.30 p.m., to receive and audit the annual report and balance sheet for the year 1943, and to elect the honorary officials, committee, and honorary auditors.

Dr. J. Pardon Martin will give a talk on ocular palsies at a meeting of the Clinical Society of the Royal Eye Hospital to be held on Friday, May 26, at 5.30 p.m., in the hospital (St. George's Circus, Southwark, S.E.).

The Minister of Health has appointed Dr. John Alexander Charles to be a Deputy Chief Medical Officer in the Ministry of Health. He will take up his duties on May 15. Dr. Charles has been M.O.H. for Newcastle-upon-Tyne since 1932, and is a member of the Minister of Health's Medical Advisory Committee.

The Empire Rheumatism Council announces that Lord Horder has received from Moscow for the Council a small supply of the anti-reticular serum of Prof. Alexander Bogolometz, which is stated to have specific influence upon rheumatic conditions. Tests on a scale limited by the amount of serum available are being made under carefully selected conditions, and results will be communicated to the medical press in due course.

The name of Dr. J. Cochrane Henderson has been picked by the King in Privy Council as High Sheriff of Westmorland. He is the first active medical man in the county to hold this honour.

The following appointments, awards, and mentions are announced in recognition of gallant and distinguished services in Sicily.  
O.B.E. (Military Division).—Lieut.-Col. F. B. Bowman and Major N. L. Elvine, R.C.A.M.C.  
Mentioned in Dispatches.—Col. C. H. Playfair, O.B.E., Major W. A. Oille, and Capt. W. H. Clare, R.C.A.M.C.

CASUALTIES IN THE MEDICAL SERVICES  
Wounded.—War Subs. Capts. J. R. Dow, P. A. J. Smith, H. H. Watts, R.A.M.C.  
Prisoners of war.—Capts. P. T. Millard and R. E. Maffey, A.A.M.C.  
Killed in action.—Capt. E. Gibbon, R.A.M.C.

**DEATHS IN THE SERVICES**

**Capt. EDWARD ARCHIBALD WALKER, M.C., R.A.M.C.,** who died suddenly at Sheffield on April 9, was the youngest son of the late Major-Gen. James Grant Duff Walker and Mrs. Walker. He served in the war of 1914-18 in France and was awarded the Military Cross, being also mentioned in dispatches. Towards the end of the war he was wounded and taken prisoner of war by the Germans. He served for some years in the I.M.S., and on retirement from that Service he was in charge of the British hospital and colony at Oporto. On the outbreak of the present war he relinquished his practice in Portugal and rejoined the R.A.M.C. He was in charge of the reception station at Lincoln for two years and later was transferred to Sheffield. A colleague writes: He was high-minded and generous in judgment, courteous and philosophic, and these qualities, together with his cheerful disposition, made him a delightful companion. He was unassuming and quietly efficient; one with whom it was an honour and a privilege to work. For his kindness and sincerity he will always be remembered with deep affection and regard. He is survived by his wife and son, Lieut. Alexander D. Walker, R.E., at present serving in Burma.

Detention and Treatment of Mental Defectives  
Commons on April 25 Mr. BOWLES

Mr. WILLINK, in reply, said that there was much modern statute law on this subject. So far as admission was concerned, the safeguards were very substantial with regard to the medical certificate, the rights of parents, and in proceedings before the judicial authority, which consisted of selected magistrates. There were a great many checks on the certificate of any doctor. The question of the length of detention did not rest simply on the order made. Within seven days after admission, the medical officer of the institution had to make to the Board of Control his own medical statement on the case. He might concur or disagree with what the Court had done. If there was any disagreement there was consultation, and at any time, with regard to any case, the Board of Control could discharge the patient. The first order operated only for a year. So far as institutions were concerned, the Board of Control had directed that the detention should be extended to the quarter day after the original order, and, unless another order was made, the original order ceased to operate on that date. The subject was visited, and there were always two and more, often five or six visitors, including at least one medical man, who must be appointed under the Lunacy Acts, with special qualifications. It was far from being the case that there was any inducement to detain too long. At present many institutions were overburdened with serious cases, and applications could not be accepted

In a reply on April 27 to Mr. Sorensen, Mr. WILLINK said the scarcity of materials and labour for mentally defective children at present, but local authorities had been invited by circular to provide newly built accommodation for them in suitable houses to submit proposals for acquiring and adapting to meet their most pressing needs. The provision of accommodation to meet the post-war needs of these children was under consideration, but the extent of such provision must necessarily depend upon the conditions then existing.

On April 25 Dr. MORGAN asked the Minister of Health whether, in his negotiations up to the present with representatives of the profession, he had ascertained whether the medical profession were prepared to accept the Central Medical Board to be as outlined in the White Paper or whether their ideas ran in the direction of more unrepresentative corporate bodies such as the B.B.C., the Electricity Commissioners, the L.P.T.B., etc., or a corporate body of special constitution, practically granting workers' control to the medical workers of the proposed medical service. Mr WILLIAMS: No, sir, I have not yet received any official views from the profession's representatives on this subject.

On April 25 Mr. VIANI asked the Minister of Health whether the Service Departments were supplying Sir Arthur MacNalty, editor-in-chief of the official Medical History of the War, with full information of the diseases that had occurred and were occurring in all the theatres of war. Mr. WILLINK: I understand from Sir Arthur MacNalty that every effort is being made by the medical branches of the Service Departments to secure, for the official Medical History of the War, as full information as possible concerning the diseases that have occurred or are occurring in all theatres of operations in which British forces are taking part.

**Research: Income Tax Concessions**

In the course of his Budget speech in the House of Commons on April 25, Sir JOHN ANDERSON emphasized the importance of research. He said that an expenditure of a capital character, which meant normally expenditure on laboratory buildings, plant and machinery, should be allowed over a period of five years or over the life of the assets if shorter, as a deduction from profits for income tax purposes. In addition, all current research expenditure, such as salaries, wages, cost of materials, repairs, and so forth, would be allowed as and when incurred by the trader. This allowance of capital expenditure over a period of five years would be the rule for research for a trading concern in its own account. In addition, he proposed that any payment whether for a capital purpose or not, made by a trader to a central research body approved by the Department of Scientific and Industrial Research should be allowed as and when made as a deduction in computing the profits of the university or college on matters of concern carried out by the university or college or allowed. He hoped to the trader's business would similarly be allowed. Industrial research technique in the development of research. Industrial research workers must be provided not only with the physical apparatus which supplied their needs but with the motive that evoked their latent powers.

**Shortage of Beds for Tuberculosis**

In answer to Mr. Keeling Mr. WILLIAMS said on April 27 that he knew there was a shortage of beds in sanatoria for tuberculosis. Every effort continued to be made, so far as existing conditions allowed, to ease this problem by sanctioning emergency building within the present severe limitations of labour and materials; by recourse to whatever other supplementary accommodation could be made available, including beds in Emergency Hospitals; and by endeavouring to remedy shortages of staff required to bring additional beds into commission. During last year a net increase of some 1,500 beds was secured by these means.

**Penicillin**

Mr. LEWIS asked the Lord President of the Council whether any had been made by the Government for the purpose of providing penicillin for the treatment of tuberculosis.

On May 2 Major LYONS asked the Lord President of the Council what distribution of penicillin had been made by the appropriate committee of the Medical Research Council: on

what date or dates and to what aim were the quantities directed, respectively; was any particular test or condition excluded owing to shortage of supply; whether any and which of the recipient centres had published any report of its work in this connexion; and had it yet been considered by him. Mr. ARMITAGE circulated the following answer: "The Penicillin Clinical Trials Committee appointed by the Medical Research Council is responsible for the distribution only of a part of the penicillin supply which is allocated for research in this country; the remaining and larger part is going to the Forces overseas. The total quantity distributed by the committee up to the end of March, 1944, was about 500,000,000 units, of which about 420,000,000 units were divided between the hospitals in Oxford, London, and Edinburgh chosen as the main centres for clinical trial. The committee has also provided smaller supplies for specific clinical purposes to fourteen other centres in this country, and sixteen further projects for particular forms of study were approved at a recent meeting. The aim of these clinical trials is to treat cases under controlled conditions in order to determine the value of penicillin in different diseases and the best methods of its use. No proposals for any promising investigation have been rejected owing to shortage of supply. In some of the institutions work has not been in progress long enough to justify publication of results, but several reports have been issued and others are in prospect. A full account of the work at one of the main centres was published in the *British Medical Journal* on April 15. Such reports are of a technical nature, and were more for the consideration of the medical profession than of Ministers."

Mr. PIAT, replying to Mr. A. Edwards on May 2, said that the production of penicillin was being increased as rapidly as possible. He regretted, however, that it was not possible to give any reasonable estimate of the time when supplies would be available for general use in this country, as this must depend, among other things, on Service requirements.

#### Notes in Brief

Firms outside the Therapeutic Research Association are making penicillin. Sir Andrew Duncan says the general policy is to encourage production on the widest possible lines. Fears of monopoly are unfounded.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* during the week notifications of whooping-cough went up by 456, and those of measles by 206, but there were 263 fewer cases of scarlet fever, and 154 fewer of acute pneumonia.

There were only a few exceptions to the general decline in the incidence of scarlet fever, notably Lancashire, with 28 more cases than last week. In several counties there was a big increase in whooping-cough, especially in Essex, Warwickshire, Lancashire, London, and Middlesex, with rises of 81, 53, 50, 45, and 43 respectively over last week's totals. Lancashire reported 84 more cases of measles than last week, and Middlesex 43. The decline in acute pneumonia was greatest in the south; the south-eastern and south-western counties accounted for 94 of the 154 fewer cases.

A rise of 25 was recorded in the notifications of dysentery. The chief outbreaks were Northampton 37, Daventry R.D. 35; London 33, Woolwich 10; Southampton 21, Droxford R.D. 10, Petersfield R.D. 10; Lancashire 21; Middlesex 12; Derby, Heanor U.D. 12.

In *Scotland* the chief features of the returns were large rises in the notifications of measles, from 239 to 632 cases, and whooping-cough, from 56 to 178 cases. The rise in measles was due almost solely to the epidemic in Glasgow, where an increase of 333 was recorded over last week's figure. The biggest rises in incidence of whooping-cough were in the cities of Glasgow 56, Aberdeen 35, and Dundee 15. The notifications of dysentery fell by 19 but the incidence is still high. A fresh outbreak was recorded in Orkney County, involving 22 persons; the other large returns were Edinburgh 24, Glasgow 11.

In *Eire* the notifications of measles fell by 119, the highest returns for this disease being Dublin C.B. 73; Limerick C.B. 36; Dublin, Dun Laoghaire U.D. 35; Cork C.B. 31.

In *Northern Ireland* a general rise in infectious diseases was reported from Belfast C.B. Measles showed 12 more cases than last week, whooping-cough 11, and scarlet fever 8.

### Week Ending April 29

The notifications of infectious diseases in *England and Wales* during the week included: scarlet fever 1,764, whooping-cough 2,397, diphtheria 628, measles 2,055, acute pneumonia 711, cerebrospinal fever 71, dysentery 218, paratyphoid 4, typhoid 9.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 22.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) *England and Wales* (London included), (b) *London* (administrative county), (c) *Scotland*, (d) *Eire*, (e) *Northern Ireland*.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) *The 124 great towns in England and Wales* (including London), (b) *London* (administrative county), (c) *The 16 principal towns in Scotland*, (d) *The 13 principal towns in Eire*, (e) *The 10 principal towns in Northern Ireland*.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	75	3	32	5	2	83	10	29	3	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Diphtheria .. ..	622	31	166	105	28	710	42	121	50	31
Deaths .. ..	15	—	2	1	1	15	—	2	2	2
Dysentery .. ..	201	33	95	3	—	63	7	26	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	2	—	1	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	54	10	2	—	—	47	7	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	11	—	—	—	—	5	—
Deaths .. ..	40	15	25	6	3	47	15	3	18	—
Measles .. ..	2,784	253	632	263	15	13,490	868	508	36	10
Deaths .. ..	—	—	—	3	—	11	1	2	1	—
Ophthalmia neonatorum .. ..	60	3	14	2	—	101	7	24	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	2	1	2 (B)	—	—	5	—	2	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* .. ..	829	63	4	9	7	866	67	13	3	1
Deaths (from influenza) .. ..	18	2	2	2	—	30	1	1	1	—
Pneumonia, primary .. ..	—	34	220	30	10	—	—	212	20	6
Deaths .. ..	—	—	8	—	—	—	—	—	—	—
Polio-encephalitis, acute .. ..	1	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	5	—	1	1	—	7	—	2	4	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	—	14	—	—	—	—	11	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	150	8	11	3	1	156	8	9	2	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,607	103	189	18	77	1,770	164	211	39	5
Deaths .. ..	—	—	1	—	—	—	—	—	—	—
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	1	—	—	11	2	3	—	6	8	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	—	—	—	—	—	—	—	152	28	—
Deaths .. ..	—	—	—	—	—	—	—	5	3	—
Deaths (0-1 year) .. ..	353	55	79	35	24	371	53	64	36	—
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	4,505	646	593	240	128	4,401	631	610	193	—
Annual death rate (per 1,000 persons living) .. ..	—	—	13.6	15.7	4	—	—	13.7	12.7	—
Live births .. ..	7,541	947	1,027	489	298	6,105	724	913	372	—
Annual rate (per 1,000 persons living) .. ..	—	—	20.9	31.9	4	—	—	18.6	24.5	—
Stillbirths .. ..	239	26	35	—	—	228	22	35	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	33	—	—	—	—	37	—	—

\* Includes primary form for *England and Wales*, *London* (administrative county), and *Northern Ireland*.

† Includes puerperal fever for *England and Wales* and *Eire*.

‡ Owing to evacuation schemes and other movements of population, birth-death rates for *Northern Ireland* are no longer available.

## Letters, Notes, and Answers

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### ANY QUESTIONS?

#### Localized Postural Oedema

**Q.**—May I have an expert opinion on the following clinical problem? The patient, usually a young woman, complains of oedema of the feet and ankles and occasionally the legs over a number of years. Sometimes this oedema is unilateral. Certain of these patients have work involving a great deal of standing, but as many have not. There is no familial history of the condition; no cardiac or renal abnormality; no varicose veins or phlebitis; no obvious pelvic lesion; no history of trauma; no flat feet or obvious vascular condition apart from some lividity of legs which does not resemble the type seen in erythrocytosis crurum puellarum frigida. Radiological investigation of the bones is negative. The swelling is worse at night and relieved by rest. It is not associated with pain. Could you suggest any other aetiological factors and lines of treatment?

**A.**—This is an excellent description of the condition known as idiopathic oedema, or, preferably, localized postural oedema. It is more frequent than is generally realized, as medical officers supervising women in industry and the Services have recently discovered. It often gives rise to needless alarm and is always troublesome to treat. In health, the filtration pressure of the blood in the capillaries is balanced by the osmotic pressure of the plasma proteins. The high venous pressure in the lower extremities, particularly in the erect position, entails a rise in the capillary pressure and therefore in the tendency to filtration of fluid into the tissues. Transudation of fluid into the legs on standing can be demonstrated in both males and females, and distinct oedema will occur if the foot is allowed to hang down motionless for some time. Normally, fluid does not accumulate, being expressed from the limbs by muscular movements and changes in position. It is a little difficult to see why the mechanism should break down and oedema develop in women, particularly young women. Diminished elasticity of the tissues is one factor, more particularly in association with tight shoes, high heels, and wrong posture. The water-retaining properties of the female sex hormones are probably also important, and it may be found that the oedema is worse about the time of menstruation. Local treatment is more effective than general, and consists in avoidance of high heels, massage and exercises of the ankles, contrast baths, and strapping with adhesive tape. It would be interesting to get statistics on the frequency of postural oedema in those who dance and those who don't, but reasoning *a priori*, the factory girls' passion for dancing should not be discouraged. Sometimes a formal manipulation of the ankle may be desirable. Tight garters, etc., should of course be avoided and overweight should be reduced. Of general measures, restriction of salt is probably the most rational. Calcium salts are indicated in theory but disappointing in practice. Small doses of thyroid and large doses of alkalis have also been used.

#### A Case of Bacterial Food-poisoning

**Q.**—A child, then aged 11 months, contracted a *Salmonella* poisoning, due to *B. aertrycke*, eleven weeks ago. Diarrhoea lasted six weeks, and there are still brief relapses, with loose motions, and the faeces are still infected. The usual treatment was given in the acute phase, and two courses of sulphaguanidine. What further treatment can be given to clear the infection?

**A.**—It is still a common assumption that an attack of bacterial food-poisoning produces such a violent reaction in the alimentary tract that everything, including the infecting organism, is quickly eliminated. The use of more selective culture media has shown, however, that after an attack of gastro-enteritis due to one of the *Salmonella* organisms the pathogen may persist in the gut for days or weeks after the patient is clinically well. As a rule these convalescent carriers clear up in 3 to 6 weeks, and only very rarely after infection with a *Salmonella* organism of the food-poisoning type does a chronic carrier-state supervene. In such cases aspiration

of duodenal contents should be done, as is advised in dealing with enteric carriers, to find if the pathogen is living in the gall-bladder. In children, infection with certain members of the *Salmonella* family is often accompanied by systemic invasion, giving rise to such conditions as continued fever and meningitis. It is also possible, as happens with the enteric group, that the organism may settle in the bone marrow.

In this particular instance the best advice is to "wait and see." The chances are that the carrier condition will clear up spontaneously, but if the organism continues to be excreted in the faeces in considerable numbers for 2 to 3 months more the likelihood is that there is a reservoir of infection either in the gall-bladder or in the bone marrow. If the gall-bladder is incriminated, cholecystectomy gives the best prospect of cure, although such a radical operation may not be thought advisable for the carrier of an organism which is not likely to cause serious illness in others. The intestinal sulphonamides by themselves are unlikely to effect a cure. Small daily doses of mag. sulph., such as used to be given for the treatment of bacillary dysentery, should be tried. American workers have claimed success from the use of the iodophthalmic dyes for the treatment of enteric carriers, but this claim has not been substantiated by British workers.

#### Cause and Treatment of Sprue

**Q.**—What is the current accepted view of the cause of sprue? Would it be possible briefly to state the general line of treatment, especially in the control of intestinal fluidness with the passage of sinking gases?

**A.**—The cause of sprue is unknown, but it is suggested that a dietetic deficiency, possibly some components of the vitamin B<sub>12</sub> complex but not of nicotinic acid only, brings about a metabolic breakdown leading to interference with the normal absorption, particularly of fats, from the alimentary tract. The basis of treatment consists in a high-protein, low-fat, low-carbohydrate diet, and the Ministry of Food has arranged for patients suffering from sprue to be allowed an extra meat ration in lieu of their butter. The total initial amount of diet depends on the severity of the disease and the tolerance of the patient, and is gradually increased as the patient improves. An average trial diet might consist of 3 to 5 oz. of underdone minced lean meat three times daily, with jelly, orange juice, a little glucose, rusks, and apple jelly; in the early stages of severe cases "sprulac" (a defatted dried milk powder) is useful. The absorptive failure in sprue may be associated with secondary nutritional defects. Commonly there is a macrocytic anaemia requiring the administration of liver extract—e.g., equivalent to half pound fresh liver daily—while vitamin C and nicotinic acid—e.g., 200 mg. daily—are important. Riboflavin may also be indicated where there is stomatitis, and hydrochloric acid in the presence of achlorhydria. Under proper dietetic treatment the symptoms usually subside rapidly and the patient steadily improves, but occasionally diarrhoea or meteorism may be troublesome for a time, in such cases castor oil followed by powdered chalk, charcoal, and kaolin may be useful. Any associated infection—e.g., *B. coli* urinary infection, which is not uncommon—should be treated on ordinary lines.

#### Indications for Circumcision

**Q.**—What is the modern teaching regarding the indications for circumcision? We feel that a great many unnecessary circumcisions are performed. Is it not sufficient in mild degrees of phimosis without obstruction to employ passive stretching instead? Is it justifiable to perform circumcisions where neither of these indications is present? We are under the impression that the prepuce subserves a useful purpose in protecting the glans penis.

**A.**—I agree that circumcision is often carried out unnecessarily. In the great majority of cases the prepuce can be separated from the glans penis with a blunt probe and withdrawn. Sometimes stretching is also required, and this can be done by means of vaselined artery forceps. Only when the prepuce is a very long one, or cannot be stretched, is circumcision necessary. Paediatricians say that many of these cases right themselves in time. But as circumcision in childhood has disadvantages unattached to circumcision in infancy, it is better not to rely on this. The prepuce undoubtedly has a function, but so far as can be seen circumcised men are not in any way penalized. They have the advantage of avoiding such troubles as recurrent attacks of balanitis and carcinoma of the penis.

#### Toxic Effects of Emetine

**Q.**—What are the possible toxic effects of emetine when used in the treatment of amebic dysentery? Textbooks warn us to watch for toxic manifestations, which are described as "cardiac" and "neutric"; but details are usually lacking.

**A.**—Tachycardia and cardiac irregularity sometimes occur after emetine has been given, but evidence of myocardial damage after therapeutic doses—e.g., 1 gr. daily intramuscularly or subcutaneously for not more than 10 days—is rare, and this is confirmed by electrocardiographic tracings. After intravenous injection, or large doses,

the tracings may show delayed conduction, diminution in voltage, and lowering or inversion of the T wave. It seems reasonable, therefore, to insist that patients receiving enetine should remain in bed during the whole course of treatment, and that the standard dosage recommended above should not be exceeded. Enetine in excess or prolonged dosage may cause diarrhoea, and the recurrence of diarrhoea towards the end of treatment for amoebic dysentery may be due to the drug; although this is rare, it sometimes leads the unwary to prolong the course excessively. Neuritis, myositis, desquamation, and atrophy of the nails have been recorded after enetine, but are uncommon. Apart from the fact that on therapeutic grounds closely repeated courses of the drug are rarely needed, it is undesirable, having regard to possible toxic effects, to repeat a course of enetine without allowing an interval of a week or two to elapse.

#### Solar Dermatitis

**Q.**—For many years I have had a patient who suffers from violent dermatitis due to the sun's rays. He is liable to boils and cracks of the face on any bright day. So acute is it that he cannot go out in bright weather and has to spend his time in a darkened room. I should be most grateful for any suggestion.

**A.**—A 10% freshly prepared watery solution of tannic acid is often successful. It should be applied to the exposed skin and allowed to dry on. When quinine is obtainable it may also be similarly used in a protective paste.

#### Ringworm of Nail

**Q.**—May I have advice on treatment of ringworm of the nail?

**A.**—Since drastic treatment is called for in this rare and rebellious form of ringworm, it is important to establish the diagnosis by microscopical examination or by culture. Complete surgical removal of the nail followed by dressing with 2% chrysarobin may succeed. Treatment with thionin X has proved successful in some cases.

#### The Oxford Vaporizer

**Q.**—(1) What precautions are necessary when using the Oxford vaporizer on a 6-weeks-old infant and in an old man of 80 years? What is the procedure to be adopted for the operation of tonsillectomy in children? (2) In what circumstances must the expiratory valve be screwed down? (3) Is it essential to deliver the ether mixture by compression of the bellows during the whole operation? (4) How much ether is to be put in for an operation lasting half an hour? and (5) is it safe to recover the remaining ether immediately after the operation? (6) Is it safer to use chloroform rather than ethyl chloride for induction?

**A.**—Many of the points raised in this query are dealt with in the booklet of instructions issued with the Oxford vaporizer. (1) No precautions are needed in an old man of 80, but in a 6-weeks-old infant, and for tonsillectomy, the bellows are used as *à vis* a *tergo* to drive over the ether air mixture to the patient. (2) The expiratory valve should be fully opened except in the rare cases in which the apparatus is used for artificial respiration. Here the expiratory valve is screwed down so that when the bellows are compressed nitrogen will be forced into the patient's lungs, and not escape out of the expiratory valve. (3) No, if the face-piece is firmly applied, compression of the bellows is unnecessary; when the patient breathes, concentrations of ether vapour reach the patient. (4) The amount of ether used depends very much on the type of patient and on the type of operation; roughly speaking 2 oz. will be used in an operation lasting half an hour. (5) It is quite safe to leave it in the vaporizer for many months. (6) The vaporizer can be used equally well after induction with either chloroform or ethyl chloride. The method of induction must be left to the man on the spot. An anaesthetic agent is made safe or dangerous by the man who uses it.

#### Marriage after Oophorectomy

**Q.**—Nine years ago a patient had her ovaries removed. She now wishes to marry (she will be aged 31 this year) and wants to know how this affects her physically, apart from not being able to have a child. How much ought she to tell her proposed husband, and will she be cheating him physically? She has been told by friends that in her state sexual intercourse is impossible. She is a highly intelligent young woman, virgin, and very sensitive. How would you suggest she should broach the subject to her fiancé, and how much do you think it best I should tell her?

**A.**—This is the sort of question which can really be answered much better by the family doctor than by the expert. One would like to know more about the reason for the removal of the ovaries at the very early age of 22, and much more about her psychology and that of her prospective husband. In general I think it is safe to say that she should tell him the whole truth. In the long run it would probably be better for the match to come unstuck now

rather than that she should be accused later of deception or, worse still, have to conceal so intimate a matter all her life. There is no reason to believe that she will be cheating him physically. If her vagina is normal he will be able to have intercourse with her normally. It is possible that she herself will not obtain the fullest possible pleasure, but even this does not necessarily follow, for some women continue to have orgasm after the menopause. She herself should be told the whole truth. As she is a very sensitive girl, you might well suggest to her that you should explain things to her fiancé, but whether you take this course must depend upon your estimate of her character and his. The question of substitution therapy might be considered, but only if she has menopausal symptoms. If there are present they will probably be well controlled by 1 mg. hexoestrol daily, or even less.

#### LETTERS, NOTES, ETC.

##### Tonsillectomy in Children

**Dr. L. DUTTON MATSON** (Birmingham) writes: I feel deeply indebted to Mr. Morton Marks for his letter on tonsillectomy in children (March 25, p. 436). After fifteen years in general practice I became increasingly sceptical about the advantages and benefits to health anticipated from this operation. But of the harm done to a child by neglect in having adenoidal vegetations removed, I have been acutely aware for some years now. At the present moment my youngest child is experiencing and illustrating some of these effects—continued "head colds," increasing mouth-breathing, culminating in almost complete deafness. The surgeon who will deal with him when the neuter catarrhal condition has subsided (and whom I met for only a few minutes; my family is evacuated, my wife ill—health results from "adenoids" rather than from unhealthy tonsils. I have a very genuine esteem, in collusion, for both of whose opinions the point. Mr. Morton Marks's letter and another I recall some months back to the same effect from a Shrewsbury surgeon (reference not to hand) have given me the moral support I need. The child will retain his hearing but retain his tonsils, and will suffer very much less pain and distress.

##### Pregnancy and Tuberculous Spine

**Dr. WILLIAM D. GRAY** (Bishop Auckland) writes: With reference to the "Any Questions?" of April 15 (p. 545) under the above heading, I have personal knowledge of three cases of the above. All were delivered of healthy babies, who are now growing up all right. Two of the mothers have suffered ill effects from the pregnancy. The first patient, now aged 32, conceived while lying in a plastic bed at home, and extension of the disease was found at the next x-ray examination. After delivery she developed a psoas abscess, which came and went, but has again recurred six years after delivery. The second patient, aged 26, who had a bone graft done when she was three or four months pregnant, was all right for several months, but then developed a cold abscess on the back in the region of the graft. This disappeared after aspiration. She kept well fit and loins, and x-ray examination showed partial absorption of the graft on the right side and a small paravertebral abscess. She is now awaiting further treatment. The third patient, aged 28, has gross kyphosis of the spine with extreme deformity, and had a sinus discharging for some years until 1941. X-ray examination at that time showed bony fusion. Her baby was born in 1943, but so far no evil effects have been noted.

##### Breathing Exercises

**Mr. HAROLD CHAPMAN** (London, W.1) writes: Reference to the use of breathing exercises after removal of tonsils and adenoids made in the *Journal* of April 29 (p. 609). Children frequently continue to keep their lips apart as a habit subsequent to the removal of tonsils and adenoids. If the relations of the upper and lower incisors are correct when the jaws are closed normally, the opening of the mouth can be cured by the simple exercise of holding a light object—e.g., an aluminium rod, 2 to 3 in. long, attached to tape while goes round the neck—with the lips. The more this exercise is done the quicker will a cure be effected. One should not hold the exerciser for an hour without releasing it; a skilled teacher is not essential for this; I give a few typed instructions. If the relations of the incisors are not normal, then it may not be reasonable to ask a child to keep the lips closed until the teeth have been corrected; when this has been done it is usually found that the bad habit has disappeared without treatment for the condition.

##### Disclaimer

**Dr. KEITH GREGG** wishes it to be known that any article or photograph published in the lay press about his branch surgery was entirely without his knowledge or consent.



# BRITISH MEDICAL JOURNAL

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## THE COURSE OF THE DEATH RATE FROM PEPTIC ULCER IN GREAT BRITAIN, 1912-38

BY

Sir HENRY TIDY, D.M., F.R.C.P.  
Consulting Physician to St. Thomas's Hospital

This communication is a study of the trends of the crude death rates during the period 1912-38 for peptic ulcer and for gastric and duodenal ulcer separately, in males and females, for England and Wales, London (Administrative County), Rural Districts of England and Wales, and for Scotland. There are indications that striking changes have taken place during the last 20 years of the period. The data are from the Annual Reviews of the Registrar-Generals for England and Wales and for Scotland and the Annual Reports of the London County Council. With regard to age, the number of deaths has been taken separately for the age groups 20-39 years and for 40 years and over, and the death rates calculated per million living in the age group and sex group and area concerned in the various years. The death rates have also been calculated for the total of the age groups over 20 years.

Deaths from gastric ulcer were first recorded separately for England and Wales in 1901. For duodenal ulcer, deaths were first recorded separately for England and Wales in 1911, and for London, Rural Districts of England, and Scotland in 1921; deaths had previously been included in a mixed group of diseases of the stomach or intestines, but had not been classified with ulcer of the stomach.

The Registrar-General's Return of Deaths for England and Wales also gives statistics for Urban Districts and County Boroughs. Both may be regarded as mixed urban and rural populations scattered over the country. A test of a few death rates indicates that these do not greatly differ from each other or from the rates for England and Wales as a whole, and they will not be further referred to. London's is a purely urban population, and that of Rural Districts of England and Wales is the nearest approach available to a rural population.

The statistics for peptic ulcer for London and for the Rural Districts have been recorded on three different systems between 1912 and 1937. From 1912 to 1920 gastric ulcer alone is recorded. From 1921 to 1930 there are records for both gastric and duodenal ulcer. From 1931 the only return is for peptic ulcer. Thus there is no consecutive series from 1912 to 1937. For Scotland, as for England and Wales, there are records for both gastric and duodenal ulcer since 1921.

For England and Wales and the various areas full returns are not yet available for 1938. From 1915 to 1918 the return of deaths is for civilians only, nor is the age distribution of the population generally available. Consequently this period is omitted from consideration.

The number of deaths annually in certain groups is too small to permit of more than certain general deductions. In

the group of duodenal ulcer in females between 20 and 39 years the deaths do not exceed 10 in any one year for Scotland, London, and Rural Districts, and the death rate for England does not exceed 5 per million. There is no evidence of an increase in any area. The mean of the death rates for the period 1921-30 and for 1931-7 is 5 in each instance for Scotland and 3 for England.

Tables I-III record the crude death rates per million living for England and Wales, London (Administrative County), Rural Districts of England and Wales, and for Scotland, for

TABLE I.—*Peptic Ulcer. Crude Death Rates per Million Living. From the Registrar-General's Returns*

	Population over 20 yrs.	Males			Females		
		Over 20 yrs.	20-39	Over 40 yrs.	Over 20 yrs.	20-39	Over 40 yrs.
<i>England:</i>							
1912 ..	107	129	70	197	87	67	110
1921 ..	100	143	70	210	64	32	98
1931 ..	155	252	83	407	70	17	115
1937 ..	159	260	74	423	69	10	113
<i>London:</i>							
1921 ..	117	177	84	257	65	24	108
1930 ..	211	354	130	555	92	37	155
1937 ..	208	353	84	606	87	10	150
<i>Rural Districts:</i>							
1921 ..	92	115	46	173	71	34	103
1930 ..	133	207	81	308	61	15	96
1937 ..	137	213	51	336	64	15	97
<i>Scotland:</i>							
1921 ..	134	185	85	303	88	38	146
1931 ..	151	287	116	454	88	23	147
1937 ..	209	349	122	559	86	5	155

TABLE II.—*Gastric Ulcer. Crude Death Rates per Million Living. From the Registrar-General's Returns*

	Population over 20 yrs.	Males			Females		
		Over 20 yrs.	20-39	Over 40 yrs.	Over 20 yrs.	20-39	Over 40 yrs.
<i>England:</i>							
1912 ..	80	82	43	127	77	63	94
1921 ..	72	92	44	136	55	23	82
1931 ..	105	159	49	260	58	13	96
1937 ..	107	167	46	273	54	8	89
<i>London:</i>							
1921 ..	95	120	64	186	75	47	106
1931 ..	87	119	59	172	58	20	98
1937 ..	160	244	53	390	82	31	141
<i>Rural Districts:</i>							
1912 ..	75	65	32	103	81	75	88
1921 ..	66	72	25	109	60	29	86
1930 ..	94	134	50	201	52	12	82
<i>Scotland:</i>							
1912 ..	105	110	51	175	102	70	137
1921 ..	100	129	55	215	74	31	123
1931 ..	94	122	46	195	70	18	117
1937 ..	107	155	43	259	65	1	119



TABLE III.—Duodenal Ulcer. Crude Death Rates per Million Living. From the Registrar-General's Return

	Population over 20 yrs.	Males			Females		
		Over 20 yrs.	20-39	Over 40 yrs.	Over 20 yrs.	20-39	Over 40 yrs.
England:							
1912 ..	27	47	27	70	10	4	16
1921 ..	28	51	26	74	9	4	13
1931 ..	46	93	27	147	12	4	19
1937 ..	50	93	28	150	15	2	24
London:							
1921 ..	30	58	25	85	7	5	9
1930 ..	53	110	47	168	10	5	14
Rural Districts:							
1921 ..	27	43	18	64	11	5	17
1930 ..	40	73	31	107	9	3	14
Scotland:							
1921 ..	34	56	30	88	14	7	23
1931 ..	86	165	70	259	18	5	30
1937 ..	102	194	79	300	21	4	36

certain years between 1912 and 1938 which specially illustrate the course. They give the total rates for both types of ulcer together—i.e., for peptic ulcer—the rates for gastric and duodenal ulcer separately, for the two sexes, and for the age groups 20-39 years, 40 years and over, and the total over 20 years. Figures 1-4 are constructed from the annual returns, and show the trends during the periods.

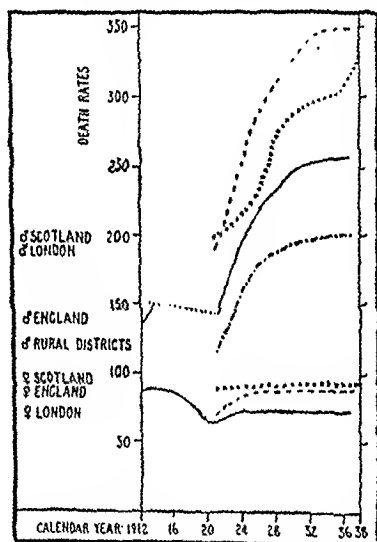


FIG. 1.—Peptic ulcer. Population over 20 years of age. Crude death rates per million living.

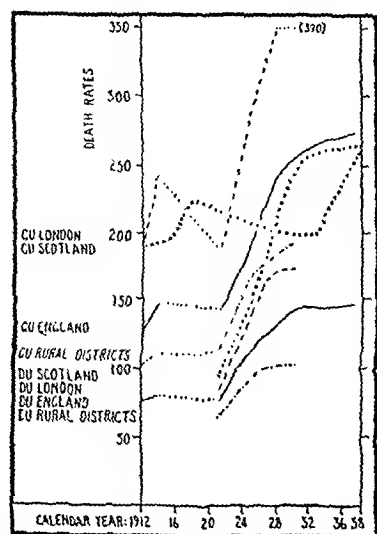


FIG. 2.—Gastric ulcer and duodenal ulcer. Males over 40 years of age. Crude death rates per million living.

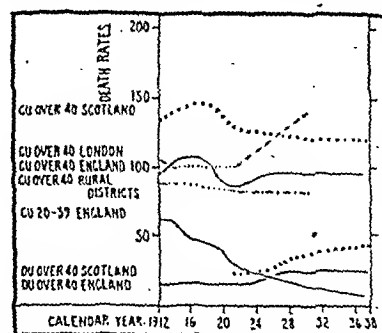


FIG. 3.—Gastric ulcer and duodenal ulcer in females. Crude death rates per million living.

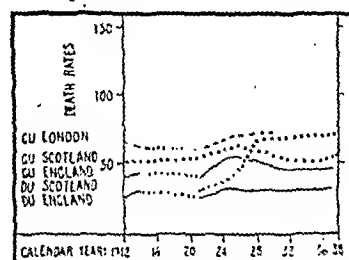


FIG. 4.—Gastric ulcer and duodenal ulcer. Males between 20 and 39 years. Crude death rates per million living.

These returns solely relate to death rates. Care is necessary in drawing deductions as to changes of morbidity in the liver from the changes in the number of deaths and the death rate. For example, the case mortality of peptic ulcer under the age of 40 has fallen in hospitals during the last 20 years. Further, the experiences of the present war have proved that the incidence of such a serious complication as perforation may increase almost instantaneously under the influence of extremely severe stimuli, while the causes of a catastrophe such as perforation are not necessarily identical with the causes which lead to the formation of an ulcer. Nevertheless appreciable increases in the death rate of peptic ulcer over a series of years must correspond to an increase in the incidence of sickness in the community.

## I. ENGLAND AND WALES

For England and Wales the crude death rate from peptic ulcer for the population of the age of 20 years and over was 107 in 1912, 100 in 1921, 155 in 1931, and 159 in 1937 (Table I). The rate was almost the same in 1912 and 1921 and was practically stationary between 1931 and 1937, though at a higher level than in 1912 and 1921; but between 1921 and 1931 there was an increase of 50%. Thus this rapid rise was followed by a stationary period and preceded by a period in which no increase had taken place. When peptic ulcer is further analysed into groups, the increase is found to be almost entirely accounted for by males over 40 years. Further, it is found that the rise in this group, starting about 1921, ceased fairly rapidly about 1930-1, and was not resumed, but that the maximum rates in 1931 were subsequently maintained.

For males over 20 years the rates show a similar trend to the total for both sexes, being dominated by deaths of duodenal ulcer. For males between 20 and 39 the rates are approximately the same in 1912, 1921, and 1937—viz., 70, 7 and 74; there are no great variations in the intervening years but the rate rose to 93 in 1925 and 87 in 1928, and was about that level during this period, subsequently falling again.

For females the trends are quite different from those of males. For females of all ages over 20 years there was a sharp fall between 1912 and 1921, entirely due to decrease of gastric ulcer between 20 and 39 years. Rates are much lower than for males, and, apart from the group mentioned, changes have been small throughout the period.

It may be noted that no group of gastric or duodenal ulcer between 20 and 39 years in Britain showed a sustained increase in death rates from 1912 to 1938, except D.U. in males in Scotland—in contrast to the rises in groups over 40 years.

### Gastric and Duodenal Ulcer

The death rates and the trends between 1912 and 1937 show differences between G.U. and D.U. Differences in the trends will be considered later. The rate from G.U. is approximately double that from D.U. for males throughout, and at least four times for females. The excess of deaths from G.U. is greater than can be accounted for by the higher case mortality in G.U. as shown by the results from admissions to St. Thomas's Hospital, which over a long period give 12.5% for G.U. and 10% for D.U.

It may be noted here that an excess of deaths from G.U. over D.U. is true not only for the total deaths for England and Wales but throughout the period for both sexes, both age groups, and in all areas of Britain except for males after 1927 in Scotland. It may also be mentioned that deaths from G.U. in males over 20 years exceeded those from females in England and Wales for the first time in 1914; a similar change occurred in London in 1908, Scotland (finally) in 1916, and Rural Districts in 1920. For admissions to St. Thomas's Hospital the change occurred at some date between 1913 and 1921. The excess in males has subsequently remained

### Gastric Ulcer in Males

In 1912 the total number of deaths of males over 20 years was 857, and in 1921 it was 1,011, the death rate rising from 82 to 92 per million males living in this age group—an increase of about 12% in 9 years (see Table II). Between 1921 and 1928 the death rate rose from 92 to 150, a rise of over 60%. The rapid rise then ceased, the rate being 159 in 1931 and 167 in 1937.

**Death Rates Over Age of 40.**—The rate in 1912 was 127, in 1921 136, in 1928 236, and in 1931 260. The rate thus increased 74% in the 7 years 1921-8 and 90% between 1921 and 1931, being preceded by an almost stationary decade between 1912 and 1921 (see Table II and Fig. 2). The rise began suddenly in 1921, was at its maximum acceleration in 1925, slowed shortly after 1928, and practically ceased after 1931, the rate in 1937 being 273. Thus the rise was also followed by an almost stationary period of years, with no fall after cessation of the rise.

**Death Rates in Age Group 20-39.**—The rate in 1912 was 43, in 1921 44, in 1931 49, and in 1937 46. There was a small transient rise to 59 in 1925, and the rate was 55 in 1928. This rise corresponded to the most rapid rise in death rates over 40 years, and was mainly due to the later ages in the group. The rise subsided, and the rate was approximately the same in 1912 and 1937. The trend is in contrast to that of the age group over 40 years. The ratio of the death rate over 40 years to that of the age group 20-39 was 3 to 1 in 1912 and 6 to 1 in 1937.

### Duodenal Ulcer in Males

**Death Rates Over Age of 40.**—The rate in 1912 was 70, in 1921 74, in 1928 128, and in 1931 147. The rate thus increased 73% in the 7 years 1921-8 and 100% between 1921 and 1931, being preceded by a stationary decade between 1912 and 1921. The rise began in 1921, was at its maximum acceleration in 1925, and reached its maximum death rate of 147 in 1931. Subsequently between 1931 and 1937 there was no indication of a further rise or of a consistent rise or fall; the range was between 130 and 150. The trend of the curve resembles that for G.U. The rise proportionately is almost identical, the ratio of G.U. to D.U. being constant during the period at 1.8 to 1.

**Death Rates in Age Group 20-39.**—The rate may be regarded as stationary between 1912 and 1937. The rate was 27 in 1912 and 28 in 1937, the range of the rates being from 26 to 34.

### Gastric Ulcer in Females

This group has certain special features. The total number of deaths of those over 20 years of age in 1912 was 897 and in 1921 705, the death rates being 77 and 55. The death rate in 1937 was 54, the range between 1921 and 1937 being 54 to 59. The number of deaths in 1912 has not been exceeded subsequently (except in 1914), in strong contrast to the course in males. The incidence in the age groups over 40 and between 20 and 39 years is so different that the total rate over 20 years is no guide to the trends.

**Death Rates Over Age of 40.**—The death rates in 1912 and 1921 were 94 and 82 respectively. (1921 was an exceptionally low year.) A moderate rise and fall had taken place between 1912 and 1921. After 1921 there was a slight rise of doubtful significance to 95 in 1925, and subsequently the rate remained stationary until 1937, the range being between 88 and 96. Thus the changes in rates between 1912 and 1937 were small, and between 1925 and 1937 were negligible.

**Death Rates in Age Group 20-39.**—The course of this group is very interesting (Fig. 3). Jennings (1940) has paid special attention to it. In 1912 deaths numbered 386 (death rate 63), being about 43% of the total of 897 over 20 years. In 1921 deaths were 175 and in 1937 were 54, the rates being 28 and 8. Between 1912 and 1937 the fall is continuous and uninterrupted, and shows no relation to the course of any other group. The death rate had been falling rapidly previous to 1912.

**Deaths under 20 Years.**—These form a striking illustration of the fall in incidence in young women. In 1912 they numbered 76, in 1921 24, and in 1937 only 1. Deaths under 20 years are now practically liquidated—at least temporarily—and under 40 years are nearly so.

### Duodenal Ulcer in Females

The death rate from D.U. in females is low at low ages. The total deaths over 20 years in 1912 were 111, in 1921 110, and in 1937 207, the death rates being 10, 9, and 15, while in males the rates were 47, 51, and 93 respectively.

**Death Rates Over Age of 40.**—The rate in 1912 was 16, in 1921 13, and in 1937 24. Between 1921 and 1925 there was a moderate rise, probably significant, from 13 to 24. This corresponds with the period of maximum rise in the male group. The higher rate was maintained after 1925, but there was no further rise. The range of the death rates between 1925 and 1937 was from 19 to 24.

**Death Rates in Age Group 20-39.**—It has already been mentioned that the rate did not exceed 5 in any year between 1912 and 1937, and there is no indication of an increase.

### Ratio of Death Rates

**Males to Females.**—For peptic ulcer at ages over 20 years the ratios in 1912, 1921, 1928, and 1937 were 1.5, 2.2, 3.3, and 3.8 to 1 respectively. The preponderance of males is rising rapidly.

**Gastric to Duodenal Ulcers.**—In the years as above the ratios of G.U. to D.U. were 3.0, 2.6, 2.2, and 2.1 to 1 respectively. The fall in the ratio in the earlier years was due to the rapid decrease of G.U. in young women. Since 1925 the ratio has been constant approximately at 2.2 to 1. For males over 40 years the ratio has been constant throughout at 1.8 to 1, and from 20 to 39 years between 1.7 and 1.8 to 1.

### Remarks

In 1912 the death rates of the various groups were fairly close together, but they are now splayed out by the great increase which has taken place in certain groups since 1921 while others have remained stationary. The trend of the rates for peptic ulcer, for G.U., and for D.U. is now mainly dictated by the rates for males over 40 years.

The difference between the rates in 1912 and 1921 in all groups is small. **Male groups over 40 years.** both G.U. and D.U., suddenly began to rise in 1920-1, and for several years the rise was very rapid: it was most rapid between 1921 and 1925. After 1928 it definitely slowed down, and the rise practically ceased in 1930. The increase between 1921 and 1931 was 90% for G.U. and 100% for D.U. D.U. apparently entirely ceased to rise after 1930, but G.U. in this group may have continued to rise slowly until 1937. But, although the rise ceased, no fall followed: the maximum rate was maintained.

Rates for females have shown little tendency throughout the period either to rise or to fall, except for G.U. under 40 years. There was possibly a slight significant rise in D.U. over 40 years between 1921 and 1925 and an even smaller rise for G.U., but rates show little difference between 1912 and 1937. Gastric ulcer in females under 40 years clearly pursued a course of its own with an uninterrupted fall which had started some years before 1912. Other groups under 40 years show only slight variations throughout the period, and there is little difference in the rates for 1912 and 1937. Both

G.U. and D.U. in males had slight temporary increases between 1921 and 1925 during the sharpest rise in the later age group, and mainly due to ages near 40.

### Summary

Death rates from G.U. and D.U. and in the various age and sex groups were almost the same in 1912 and 1921 (except for G.U. in females under 40 years).

In the period 1921-30 there were rapid increases in the rates for both G.U. and D.U. for males over 40. The maximum increase was between 1921 and 1925: the rise further slowed about 1928, and ceased in 1930. The rise was about 90% for G.U. and 100% for D.U.

Between 1931 and 1937 there were no further sustained changes in these groups. The maximum rates reached in 1931 were substantially maintained.

For the group G.U. in females 20-39 years the rate fell uninterruptedly from 1912 to 1937. Deaths under 20 years fell almost to zero.

In other female groups there was little change between 1912 and 1937.

Groups under 40 years, both male and female (except G.U.), showed little change between 1912 and 1937. Some groups had temporary rises between 1921 and 1925.

The ratio of the rates for males to females is rising rapidly, especially over 40 years.

The ratio of the rates for G.U. to D.U. since 1921 has been 1.8 to 1 for males and at least 4 to 1 for females.

## II. LONDON (ADMINISTRATIVE COUNTY)

The total number of deaths from peptic ulcer in London in recent years has been between 500 and 650 annually, of which nearly half are in the group of gastric ulcer in males over 40 years. The numbers are small in certain groups, and vary considerably from year to year.

### Gastric Ulcer in Males

In 1912 the rate from G.U. in males over 20 years was 120, and thus was considerably higher than the rate for England, which was 82. In 1921 the rate was 119, no rise having taken place. From that year the rise was rapid—mainly due to the group over 40 years.

*Over 40.*—There are indications that the rate was rising between 1912 and 1914, but in 1921 it was slightly lower than in 1912. From 1921 the rate rose rapidly. The trend resembles that of England, but the rates are definitely higher and the increase is greater. The rise was most rapid between 1921 and 1925, the increase, from 172 to 287, being 66%. The rate of rise was slowing after 1928, but the death rate was still increasing in 1930, when the records cease. The rate then was 390—about 50% higher than that for England. The total rise between 1921 and 1930 was 120%, the rise for England being 90%. As the rate for peptic ulcer, in males over 40, combining G.U. and D.U., rose only slightly after 1930, the rate for G.U. alone could not have greatly increased, but it may have done so in a moderate degree.

*Aged 20-39.*—The numbers are small. The trend closely resembles that for England, and there is a similar slight rise between 1921 and 1925. Owing to the small numbers the rates are irregular, but they are higher than those for England.

### Duodenal Ulcer in Males

Duodenal ulcer was first recorded in 1921, the rates for males over 20 years being 58—half the rate for G.U. and slightly higher than the rate for England.

*Over 40.*—The rate rose rapidly from the first return in 1921, when it was 85, England being 70. The trend closely resembles that of England. The rise was slowing after 1925. There is no rise between 1928 and 1930—suggesting a cessation similar to that of England after 1930. The rise had then been 100%. The rates are about 20 to 25% higher than those for England, but the difference is not so great as for G.U., nor was the difference increasing so markedly between 1921 and 1930.

*Aged 20-39.*—The numbers are small, the range of deaths annually being between 16 and 30. No definite deductions can be made, but there are no indications of a marked rise or fall.

### Gastric Ulcer in Females

The rate in 1921 for females 20 years and over was somewhat lower than in 1912, and both rates closely agree with those for England.

*Over 40.*—The rate rose steadily from 1921 to 1930, increasing from 98 to 141, and thus differs from that for England, which was stationary. As peptic ulcer in females, of which this group supplied 75% of deaths, had no sustained rise after 1928, the group could not subsequently have appreciably increased.

*Aged 20-39.*—The rates fell steadily from 1912 onwards, and were not higher, and indeed were slightly lower, than those for England. (The rate for 1930 was exceptionally high.)

### Duodenal Ulcer in Females

The numbers are very small, the deaths ranging from 11 to 26. Between 20 and 39 years deaths are negligible, only one being recorded in 1928. Over 40 years, there may be a slight increase. The trends and rates do not appreciably differ from those for England.

### Peptic Ulcer

The rates for peptic ulcer can be followed from 1921 to 1937. The rate for males of 20 years and over in 1921 was 177—25% higher than for England, which was 143. There was a very rapid rise between 1921 and 1925, and it continued to be rapid until 1928-30, when the rate was 354, England being 250—a difference of 40%. There was no further increase after 1930. The range from 1930 to 1937 was between 326 and 354.

*Males Over 40.*—The trend of the rates closely resembles that for all ages over 20 years. The rates in 1934-7 were about 600, and for England rather over 400, London being nearly 50% higher. In 1921 the rates were 257 and 210 respectively.

*Males Aged 20-39.*—The rates were the same in 1921 and 1937, no sustained rise having occurred, although there was an unusually high rate in 1930. The rates are about 15% higher than for England.

*Females Over 40.*—There was a moderate rise from 1921 to 1925, due to G.U. After 1928 there was no further increase. The rate in 1937 was 150, against 113 for England, the rates for London being about 25% higher than those for England.

*Females Aged 20-39.*—The number of deaths is very small in this period and the death rates are low. The rates and trend closely agree with those for England.

*Ratio of Death Rates of Males to Females.*—For peptic ulcer in those over 20 years the ratios in 1921, 1928, and 1937 were 2.7, 3.5, and 4 to 1 respectively, and are somewhat higher than those for England.

*Ratio of G.U. to D.U.*—The ratio was 2.8 to 1 in 1921 and 2.4 to 1 in 1928. For males over 40 the ratio in 1921, 1925, and 1928 was 2.0 to 1. The numbers under 40 years are too small to give the ratio.

### Remarks

London has a higher death rate from peptic ulcer than England, and has had a greater rise since 1921. The excess is shown by all groups over 40 years, but is greater for G.U. than D.U., for both males and females, so far as the records are available. Groups aged 20-39 show no great differences from those for England, but G.U. in males is somewhat higher. In general trend the rates over 40 years resemble those for England. There is a similar absence of rise between 1912 and 1921 (for gastric ulcer), a rise at its maximum between 1921 and 1925, and a cessation of further rise after 1930 with maintenance of the highest rates.

### Summary

The crude death rates for peptic ulcer, both males and females, between 1921 and 1937 for London were higher than for England, and rose more rapidly between 1921 and 1930.

The rate for G.U. in males was the same in 1912 and 1921.

Between 1921 and 1930 there were rises in all groups over 40 years except D.U. in females. The rate for G.U. in males rose 120%, and in 1930 was 50% higher than for England. D.U. in males rose 100%, and in 1930 was about 25% higher than for England. G.U. in females rose 40%, and in 1930 was that proportion higher than that for England, which had remained stationary.

Rises were greatest between 1921 and 1925, and slowed between 1928 and 1930. Subsequently there was no substantial rise, but the rate for males over 40 years may have increased to a small degree.

For groups aged 20-39 the rates and trends do not differ greatly from those for England. G.U. in males rose slightly and in females fell consistently. D.U. showed little change. Numbers are small.

London resembles England in the general trend of the rates, except for G.U. in females over 40 years. London differs from England quantitatively in that the rates over 40 years are appreciably higher than for England, the excess being greater for G.U. than for D.U., and greater for males than for females. The differences increased between 1921 and 1930. The ratio of males to females is higher for London.

### III. RURAL DISTRICTS OF ENGLAND AND WALES

The trend of the death rates for Rural Districts in general resembles those for England and for London. Thus the rate for G.U. in males is the same in 1912 and 1921. Between 1921 and 1930 there are rises, in male groups over 40 years, which are most rapid between 1921 and 1925. After 1930 the groups show no consistent rise or fall, except that the rate for males over 40 years may be slowly increasing, probably due to G.U., which was still rising slowly in 1930, while D.U. apparently had become stationary. The group of G.U. in females aged 20-39 falls. Other groups for females, and other groups in ages 20-39 years for both sexes, show little change between 1912 and 1937, with some moderate exceptions similar to those occurring for England. While such trends are similar, there are certain considerable quantitative differences between Rural Districts and England and London, especially the last-named.

#### Gastric and Duodenal Ulcer in Males Over 40 Years

For gastric ulcer the rate in 1921 was 109 and in 1930 201, a rise of 85%, compared with 90% for England and 120% for London. The rate of 201 in 1930 compares with 260 for England and 390 for London, and is thus 25% below that for England and little more than half that for London.

For duodenal ulcer the position is not dissimilar, but differences in rates are smaller. The rise between 1921 and 1930 was nearly 70%, compared with 100% for England and London. The rate of 107 in 1930 compares with 150 for England and 168 for London.

**Aged 20-39.**—Numbers are small, but the rates are consistently below those for England and London. There are slight rises in rates between 1921 and 1925, as for England, but otherwise no material change.

#### Gastric Ulcer in Females

**Over 40 Years.**—The rate is unchanged between 1912 and 1930, resembling the trend for England, so far as records are available, but at a slightly lower rate. There is no indication of the rise which occurred in London between 1921 and 1930.

**Aged 20-39.**—The rates fell regularly, but this group differs from all others in that the rates for Rural Districts, though low, are higher than for England and for London. In 1912 the respective rates were 75 for Rural Districts, 63 for England, and 47 for London. The average for the years 1921-8 is 25, 21, and 16 respectively. Although the differences are not great, they are constantly present, and it is also noticeable that the rates for London are somewhat lower than those for England.

#### Peptic Ulcer

The rates for peptic ulcer are available up to 1937. They are consistent with the trend of the rates for G.U. and D.U. separately in 1930—viz., that G.U. in males over 40 years might be slowly rising and other groups were stationary. The rates for females at 20-39 years, which must be nearly all G.U., are still higher than for England and London, the average for 1931-7 being 22 for Rural Districts, 14 for England, and 15 for London.

**Ratio of Death Rates of Males to Females.**—For peptic ulcer over 20 years the ratios in 1921, 1928, and 1937 were 1.6, 2.3, and 3.3 to 1 respectively, and are lower than for England.

**Ratio of G.U. to D.U.**—The ratio was 2.5 to 1 in 1921 and 2.3 to 1 in 1928. For males over 40 years the ratios in 1921, 1925, and 1928 were between 1.7 and 1.8 to 1. The constancy of this ratio for males over 40 years may be noted. It was unchanged for England from 1921 to 1937 at 1.8 to 1, and also at 20-39 years almost at the same ratio. It was constant for London from 1921-8 at 2 to 1.

#### Summary

The death rates from peptic ulcer, especially for males, in Rural Districts are lower than for England and greatly lower than for London.

The trends of the rates do not greatly differ from those for England.

**For males over 40 years** the rate for G.U. in 1930 was 25% less than that for England and about half that for London. The rate for peptic ulcer was closely similar, and remained so up to 1937.

The rates in groups for females in general are slightly lower than for England.

The rates in groups 20-39 years also are slightly lower than for England.

**G.U. in females of 20-39** is an exception, as the rates, though low and falling, are consistently higher than those for either England or London from 1912 to 1937.

The ratio of males to females is lower than for England and considerably lower than for London.

The ratio of G.U. to D.U., where available, was constant at 1.7 or 1.8 to 1 and the same as for England.

### IV. SCOTLAND

The trend of the death rates in Scotland affords additional evidence of the rapid changes in the incidence of peptic ulcer which have taken place since 1921, but there are certain differences from the areas so far discussed.

The death rate from G.U. over 20 years of age for both sexes in 1912 was 106, and was thus considerably higher than that of England, which was 80, London being 95. Between 1912 and 1921 there was little change. In 1921 the ratio of deaths from G.U. to D.U. was 3 to 1, England's being 2.5 to 1.

The death rates from peptic ulcer over the age of 20, available from 1921 onwards, are higher throughout than for England. The rates in 1921 and 1937 were 134 and 209, and in England 100 and 159. In 1921 the rate in each age group and sex group of G.U. and D.U. was higher than in the corresponding group for England. It was also higher than in the corresponding group for London, except for D.U. in males, in which the rates were the same. Subsequently the trends for males widely differ.

**Gastric Ulcer in Males over 40.**—In 1912 the death rate was 178. In 1921 it had risen to 215. (In this year D.U. was introduced into the statistics.) From 1921 the rate fell slowly to about 200 in 1931. In 1934 the rate began to rise again, and was rising sharply in 1937, when it was 259, and in 1938, when it was 267. The course is in marked contrast to England (and London), in which there was a rise of 90% between 1921 and 1931, and subsequently only a slight rise between 1931 and 1937.

**Duodenal Ulcer in Males over 40.**—The rate rose rapidly from the first return in 1921, which was 88—somewhat higher than the rate for England and the same as for London. Between 1921 and 1931 the rate was almost tripled, rising from 88 to 259. There was a constant increase in the rate between 1921 and 1928. Subsequently between 1931 and 1938 there was no further sustained rise, the rate in 1938 being 262. The range in this period was between 241 and 300.

This course is in marked contrast to G.U. in males over 40, and the D.U. curve crosses the G.U. curve in 1928. After diverging widely the rates were equal again in 1938. Compared with England, the rise between 1921 and 1931 is more than double, but in both there was no sustained rise after 1931. The rates rise above those for London after 1925.

**G.U. in Males Aged 20-39.**—The rates show only small changes between 1912 and 1938, and the trend resembles that for England.

**D.U. in Males Aged 20-39.**—The rate in 1921 was 30—somewhat higher than for England and London. From 1921 the rates rose proportionately rapidly until 1928, when the maximum of 82 was reached. Subsequently most of the rise was maintained. This is the only group of 20-39 years in which a sustained rise has occurred since 1912. The numbers are small and the increase is mainly accounted for by ages near 40 years, but the rise between 1926 and 1928 is apparently significant.

**G.U. in Females Over 40.**—The course shows some transient rises, but tended to fall slowly between 1912 and 1938. The rates are considerably higher than for England, but about 1926 were exceeded by those for London, which were then rising.

**Gastric Ulcer in Females Aged 20-39.**—The rates fall continuously, as in areas already discussed.

*Duodenal Ulcer in Females.*—Over 40 years the numbers are small. There may have been a slight rise. For ages 20 to 39 the numbers are negligible.

*Peptic Ulcer Over 20.*—The rates are higher than those for England. They were closely similar to London's in 1921 and 1937, but the trends were different during the period. The rates rose rapidly until about 1928, then more slowly until 1934, and then again rapidly. The curve is clearly composite.

*Ratio of Death Rates of Males to Females.*—For peptic ulcer at ages over 20 years the ratios in 1921, 1928, and 1938 were 2.1, 2.5, and 3.7 to 1 respectively.

*Ratio of Death Rates of Gastric to Duodenal Ulcer.*—The ratios for males over 40 years in 1921, 1928, 1931, and 1938 were 2.5, 1, 0.75 and 1 to 1 respectively.

### Remarks

The death rates from peptic ulcer are higher than for England throughout the periods for which returns are available. The rates are slightly lower than for London, but appreciably higher than for Rural Districts of England. The excess was shared in 1921 by G.U. and D.U., but later was due entirely to D.U., G.U. having fallen behind England. There was a rapid rise between 1921 and 1938, as in England, but with considerable differences in the contributory groups. For G.U. in males over 40 the contrast between the courses in England and Scotland is striking. For D.U. in males over 40 both countries show a rapid rise between 1921 and 1931 and subsequently a stationary period until 1938, but the rise in Scotland was double that in England. The death rate for this group in 1921 was only 88, and it is unlikely that it had been rising rapidly previously. The trend for G.U. in females under 40 resembles that for England.

### Summary

Death rates from peptic ulcer over 20 years increased rapidly between 1921 and 1928, more slowly to 1934, and rapidly again to 1938. The rates are higher than for England and appreciably higher than for Rural Districts, and usually slightly below that for London. The trend differs from that for England.

G.U. in males over 40 rose between 1916 and 1921. There was no further rise until 1934, when the rate rose rapidly until 1938. The trend is in marked contrast to those of England, London, and Rural Districts. The rates for G.U. in males under 40 have shown no material change, and resemble those for England.

D.U. in males in 1921 had approximately the same rate as in England and London. The rate rose very rapidly from the first records. For the group over 40 it had nearly tripled by 1931, the rise being greatly in excess of that for England; it then became practically stationary until 1938, as in England. The curve crossed that for G.U. in 1928, but after diverging widely the two rates were practically equal again in 1938.

D.U. in males under 40 rose between 1921 and 1928. The rates are higher than in England and London. The numbers are small.

G.U. in females over 40 shows no sustained rise between 1912 and 1938. The group under 40 has fallen continuously.

D.U. in females gives no indications of a material increase.

All rises which took place over a course of years were subsequently maintained, no material fall taking place.

### V. GENERAL REMARKS

No attempt is made here to consider fully the causes of the trends of the death rates, but attention may be directed to certain points, further study of which might assist in elucidating the predisposing causes of peptic ulcer.

*Trends in Males over 40.*—The curves for England, London, and Rural Districts possess the same general characteristics. Between 1914 and 1921 there is no material rise. From 1921 to 1925 there is a rapid rise, which slows from 1925 or 1928 to 1930. Subsequently the rate is practically stationary. G.U. may be rising slowly, but there is a change about 1930 similar to that for D.U., but not so complete. The contrast between 1921–30 and 1931–7 is definite. The maximum rates reached about 1930 are substantially maintained. These trends could be explained by new factors, introduced in 1921, reaching their maximum effect about 1930. The possibility that the rises are due to improved diagnosis and recognition is negated by the

rates for women and for ages under 40, which show no similar increases and are mostly unchanged throughout the period.

The rate for D.U. in Scotland in 1921 was close to that for England and for London. Between 1921 and 1930 the rise was twice as great as for England. Subsequently the rate became stationary, as in England. The differences are quantitative.

For G.U. in Scotland, the difference from England is not merely quantitative, as there is a complete absence of rise between 1921 and 1934. The possibility of mass differences in diagnosis is negated by the curve for peptic ulcer, combining G.U. and D.U. This is quite different from that for England and English areas, and is clearly a composite curve.

*Gastric Ulcer in Females Aged 20–39.*—The rates fall continuously, the trends being the same for England, English areas, and Scotland. The rates are highest in Rural Districts. These trends point to the existence of and disappearance of external factors, acting as predisposing causes of the manifestation of a certain group of peptic ulcer. This does not exclude the possibility of psychological stimuli acting as exciting factors.

*Peptic Ulcer in Other Groups of Ages 20–39.*—There is little change in all other groups of these ages. Death rates will be affected by the reduction in case mortality which has taken place at these ages since 1921, but it would be curious if this so exactly balanced any great rise in morbidity.

*Peptic Ulcer in Females.*—There has been no significant rise, except for G.U. over 40 years in London over a limited period.

### General Summary

*Calendar Periods.*—(a) Between 1912 and 1920 there was little or no rise in rates for peptic ulcer, or for the various groups when returns are available; (b) between 1921 and 1930 there was a rapid rise in many groups; (c) between 1930 and 1938 there was little or no further rise. The maximum rise was between 1921 and 1925, the rate of increase diminishing after 1925 to 1928 or 1930. The only definite exception to the above is G.U. in males over 40 in Scotland.

*Absence of Falls after Rises.*—Rates which rose were subsequently maintained at the maximum level.

*Age Incidence.*—Rises are almost confined to age groups over 40 years. Age groups under 40 years show little change between 1912 and 1938.

*Sex Incidence.*—(a) The rates for females, both over and under 40 have shown little or no tendency to rise between 1912 and 1938. (b) G.U. in females under 40 has fallen to a very low rate, in continuation of a decrease which began in previous decades. The ratio of males to females has consequently been rising rapidly.

The rise in rates for peptic ulcer for the population over 20 years has thus been due almost entirely to males over 40.

*Gastric and Duodenal Ulcer.*—The death rate for G.U. throughout the period is considerably in excess of that for D.U. for both sexes and age groups and all areas, except for males in Scotland after 1927. Gastric ulcer showed a slow rise up to 1938 in males over 40 in England. The rise was rapid in the last few years in Scotland. For duodenal ulcer the rate became practically stationary in all age and sex groups and all areas after 1930.

*Areas.*—Death rates for peptic ulcer are highest in London, slightly lower for Scotland, lower for England, and lowest for Rural Districts of England. These differences are mainly due to rates for males over 40. Differences are slight for males under 40 and for females, in which groups rates are low. *Scotland:*—The trend of the rates for G.U. in males over 40 is entirely different from those for England and constituent areas of England. For D.U. in males over 40 the rise was extremely rapid between 1921 and 1931. *Rural Districts:*—The rates for males over 20 are approximately 60% of those for London and Scotland and 80% of those for England.

### REFERENCE

Jennings Denys (1940). *Lancet*, 1, 395.

The March–April issue of *Industrial Welfare and Personnel Management*, the journal of the Industrial Welfare Society, contains an article on industry and rehabilitation by Dr. Harold Balm, medical officer in charge of rehabilitation, Ministry of Health, reviewing the work and progress of the movement, especially that part dealing with injuries which need not necessarily be permanent. Another article, on modern trends in industrial welfare, is by Sir Stafford Cripps, who discusses the modern conception of welfare based on the twofold contribution it can make to the social well-being of the worker and to efficiency of production.

## TREATMENT OF GAS GANGRENE

BY

J. D. MACLENNAN, M.D.

Major, R.A.M.C.; Officer Commanding a Mobile Bacteriological Laboratory

AND

M. G. MACFARLANE, Ph.D.

Secretary Anaerobes Subcommittee, Medical Research Council

The case-fatality rate of gas gangrene in the present war has been approximately 50%. Even with the low incidence found in desert warfare the disease accounts for a considerable proportion of the deaths from wounds (Pulvertaft, 1943; Wiles, 1944), and becomes a more serious problem when the incidence rises, as it is already known to have risen, with fighting in cultivated lands. The disease develops so soon after wounding and runs so swift a course that there is perhaps a tendency to regard this high death rate as an inevitable consequence of the delays and difficulties of treatment in the field. It is of course true, with long or difficult lines of evacuation, that in a large proportion of cases the patients may be admitted to hospital with the disease already established, but it is the object of this report to show again, from the case records of gas gangrene in the Central Mediterranean Force, that on the whole the fate of the patient depends on the treatment given by the clinician.

## Sources of Information

Information on the occurrence and treatment of gas gangrene is available from two sources: first, from a personal investigation carried out by one of us (J. D. M.); and, secondly, from the case reports on Army Form I 1241, which have been analysed by the other (M. G. M.).

**Field Observations with Eighth Army from July to Dec., 1943.**—Information on the anaerobic infections in Sicily is meagre. The observer was engaged primarily on other duties; furthermore, casualties were evacuated to hospitals as widely separated as Alexandria and Algiers, so that adequate follow-up was impracticable. From subsequent discussion it is thought that the 43 cases personally known represent from one-half to two-thirds of the cases occurring. The figures obtained in the Italian campaign are believed to be accurate and complete; they are for the Eighth Army only, and do not include cases among British troops in the Fifth Army. The diagnosis of gas gangrene, it may be added, has been made only on the unequivocal demonstration of a clostridial myositis.

**Analysis of Case Reports on Army Form I 1241.**—Clinicians were asked to report on this form not only cases of gas gangrene but also cases of lesser anaerobic infections. Actually the cases reported have varied greatly in nature and severity, but the differential diagnosis between gas gangrene of muscle and macrobic cellulitis has not always been explicit, and in some cases the recorded diagnosis was obviously open to question. It is necessary, therefore, in order to evaluate the effect of any line of treatment, to classify the cases on as uniform a basis as possible according to the recorded signs and severity of the illness, in spite of the obvious drawbacks in making such a classification from written records.

Out of the 173 completed reports on Army Form I 1241 referring to battle casualties in the C.M.F. received by the Medical Research Council by March 20, 1944, 126 were considered to be typical of cases of gas gangrene of muscle.

**Correlation of Results.**—It is known that the number of cases of gas gangrene which are reported on Army Form I 1241 is considerably lower than the number which have actually occurred, but, provided that the cases are not selected in any way, analysis of the reports should give a fair indication of the fatality rate and of the value of certain lines of treatment. The possibility of selection has been assessed by comparing the numbers and fatality rates of the cases reported on the forms and classified as gas gangrene with the corresponding figures for the same period obtained by personal investigation in the field.

In Table I are shown the figures for three periods in which the cases reported on Army Form I 1241 from the M.E.F. before and after El Alamein, and from Sicily, are covered

also by MacLennan's investigation. Though roughly only 50 to 60% of the known cases were reported, the case-fatality rates are not significantly different, both sets of figures showing

TABLE I

Campaign	Army Forms			MacLennan		
	Cases	Deaths	Fatality %	Cases	Deaths	Fatality %
M.E.F., 1940-2	48	32	66.7	113	58	51.4
M.E.F., 1942-3	26	7	26.9	44	13	29.6
Sicily, 1943	31	22	71.0	43	29	67.4
Italy, Sept.-Nov.	43	31	72.1	48*	33	68.8
Italy, Dec.	21	10	47.6	30*	9	30.0
Italy, Jan.-Feb.	31	15	48.4	—	—	—

\* Eighth Army only.

a reduction in the death rate in Tunisia and a considerable increase in Sicily. It appears, therefore, that the cases reported from a particular front were in fact a fair sample of those which occur on that front.

The position in the next three periods is different, since reports on Army Form I 1241 were received from the Fifth and Eighth Armies, while MacLennan's figures cover the Eighth Army only, up to the end of December. Here again the case-fatality rates in the two sets of figures are very similar, showing the persistence of a high death rate in the Italian campaign until the end of November and a somewhat abrupt fall in December. Though there is a tendency for the Eighth Army rate to be lower than the combined rate, the reduction was not in fact confined to the Eighth Army, for the cases reported in the last period, during January and February, were mainly from the Fifth Army.

It seems fair to conclude that the assessment of any line of treatment is not vitiated by any selection, on clinical grounds, of the cases reported. The main reason for the discrepancy between the number of cases reported and the number which occurred is that owing to the pressure of circumstances comparatively few reports were received of cases which were treated in advanced field units.

## Bacteriology

No complete survey of the anaerobic wound flora was undertaken in Sicily or Italy, but the consensus of opinion among pathologists in the C.M.F. was that it was very similar to that observed in Tunisia—i.e., that approximately 60% of the wounds contained clostridia, of which *Cl. welchii* and *Cl. sporogenes* were the predominant types. The findings in 17 consecutive cases of gas gangrene personally examined in Italy are very similar to those recorded from the Western European battlefields in 1917-18 and Tunisia in 1943:

TABLE II.—Organisms Isolated from 17 Cases of Gas Gangrene

<i>Cl. welchii</i> ..	14	<i>Cl. histolyticum</i> ..	1
<i>Cl. sporogenes</i> ..	8	<i>Cl. sporogenes</i> ..	10
<i>Cl. septicum</i> ..	4	<i>Cl. tertium</i> ..	10
<i>Cl. bifementans</i> ..	6	Other clostridia ..	10

## Fatality Rate and Treatment of Gas Gangrene

**Fatality Rate in Various Categories.**—The cases reported on Army Form I 1241 have been grouped in four categories, according to whether or not the disease was already established on admission of the patient to hospital and whether or not antitoxin was given in treatment (Table III).

TABLE III.—Cases Reported on Army Form I 1241

Therapy	Established on Admission		Developed in Hospital		Total		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Rate %
No antitoxin	4	16	14	20	20	18	90
With antitoxin	42	25	64	35	106	60	56.6
Total	46	29	80	49	126	78	62.0

More than 60% of the cases developed in hospital, but the death rate in this group was as high (61%) as in those in which the disease was established on admission. The high death rate cannot therefore be ascribed solely to the long lines of evacuation. Moreover, although the cases treated with anti-



oxin show a reduced fatality rate, the actual rate (56.6%) compares unfavourably with the corresponding rate in the M.E.F. in Libya and Tunisia (31.8 and 22.4%). This fact raises the question of the efficiency of the treatment. Antitoxin therapy is only likely to be effective, in the first place, if the antitoxin given neutralizes the toxin of the infecting organism. It appears from Table II that, of the species of the gas gangrene group at all frequently isolated, *Cl. bifermentans* is the only one against which the trivalent antitoxin used (*welchii*, *oedematis*, *septicum*) would not be effective. Only one case of gas gangrene was diagnosed as due to this organism, and the infection ran a subacute course (MacLennan, 1944b). It seems fair to conclude that the antitoxin used was inherently effective against the prevailing infections. In the second place, treatment with antitoxin is only likely to be effective if it is given early, in adequate dosage, and as an adjuvant to surgical measures. It follows that in judging the efficiency of treatment as a whole, the efficiency both of surgical treatment and of antitoxin therapy must be considered. Since it has been previously shown that in cases receiving comparable surgical treatment the fatality rate was significantly reduced in the group who also received antitoxin (Macfarlane, 1943) it is not considered necessary to demonstrate this again, especially as the figures in Table III constitute *a priori* evidence of the value of antitoxin. The treatment given has therefore been graded in three classes, according to the level of the combined treatment.

1st class: Treatment within 6 hours of diagnosis, including surgical measures and an initial dose of at least 50,000 units of polyvalent antitoxin intravenously.

This is essentially the treatment which has been recommended by the War Wounds Committee (M.R.C. War Memorandum No. 2, revised edition, 1943). Prompt surgical measures of a temporary nature, such as incisions to relieve tension, were included in this class.

2nd class: Treatment delayed more than 6 hours after diagnosis, or with a smaller dose or an intramuscular dose of antitoxin.

3rd class: No surgical treatment and/or no antitoxin.

The fatality rates in these classes for the cases reported on Army Form I 1241 and also for the cases personally investigated are shown in Table IV.

TABLE IV

Treatment	Army Forms			Eighth Army		
	Cases	Deaths	Fatality %	Cases	Deaths	Fatality %
Class 1	35	12	34.2	27	9	33.4
Class 2	58	35	60.4	43	25	58.2
Class 3	33	31	90.4	8	8	100.0

It is clear that when the recommended treatment was given as soon as was practicable the fatality rate was significantly lower than when treatment was delayed or inadequate. The effect is still more striking in those cases in which the disease developed after admission of the patient to hospital, where it is possible that the diagnosis was made at an earlier stage of the disease. The fatality rate in this group (Table V) was only 22%; moreover, 2 out of the 4 deaths were considered to be due to complicating factors, the men having recovered from the acute stage of the disease.

TABLE V.—Cases from Army Form I 1241

Treatment	Established on Admission			Developed in Hospital		
	Cases	Deaths	Fatality %	Cases	Deaths	Fatality %
Class 1	17	8	47.0	18	4	22.2
Class 2	20	12	60.0	38	23	60.6

**Fatality Rates at Different Phases of the Campaign.**—It will be seen from Table I that the fatality rate in Sicily and in the first three months of the Italian campaign was very high but since November has been appreciably reduced. At the same time there was an improvement in the level of treatment, for the proportion of patients receiving first-class treatment, as defined above, rose from less than 20% to more than 40%, and the proportion receiving the third class of treatment fell.

It is noteworthy that the reduction in the fatality rate took place during bitter winter fighting and at a time when the

TABLE VI

	Army Forms				Eighth Army			
	No.	% of Cases			No.	% of Cases		
		Class 1	Class 2	Class 3		Class 1	Class 2	Class 3
Sicily	31	10	58	32	48	—	66	14
Sept.-Nov.	43	23	47	30	20	—	37	—
Dec.-Feb.	52	42	39	19	57	—	—	6

difficulties and delays of evacuation were more serious than in the early part of the campaign. It appears, therefore, that the reduction is directly related to the improvement in the level of treatment. In the Eighth Army this is attributable both to increasing experience among the many surgeons newly posted from the United Kingdom and from North Africa, and also to the active supervision of the Consulting Surgeon, Eighth Army, which led to a great improvement in surgical practice in forward areas.

### Comment

Although in recent years stress has rightly been laid on the value of antitoxin therapy and chemotherapy, these measures are no substitute for adequate operative treatment; the intelligent combination of all three measures can alone ensure success. It has not been possible in this and in other series of cases to assess the value of sulphonamides, which up to the present have been the drugs commonly used in treatment; practically all patients have received them, and it is probably fair to assume that they are of some, though clearly not of striking, benefit. The point which we wish to emphasize is that when two measures which are inherently of value in the treatment of gas gangrene—i.e., surgical measures and antitoxin therapy—were instituted with speed and efficiency, the case-fatality rate was very substantially reduced. With an increased use of drugs which are more effective against clostridia than the sulphonamides alone (such as penicillin or proflavine-sulphathiazole mixtures) in addition to these two measures, a further decrease in the fatality rate may be expected.

### Administration of Antitoxin and Drugs

**Antitoxin** should be given as early as possible in the disease; the time-honoured custom of delaying its administration until after operation has nothing to recommend it and may do incalculable harm. The route of choice is the intravenous; the dosage will vary with the clinical signs, but should not be less than 50,000 units of the polyvalent antitoxin, and if the patient is at all toxic it should be 100,000 units or more. A similar dose may be given in four to six hours if thought necessary. A decrease in pulse rate is usually a reliable sign of diminishing toxæmia. It is preferable to give the antitoxin in small volume rather than spread out the dose over many hours in an intravenous drip. This is especially important in the early stages of the disease, when the antitoxin should always be given by syringe. Acute anaphylactic reactions have been extremely rare.

**Penicillin** was used in three cases personally observed, as follows:

- (i) **Initial dose**—24,000 units of sodium penicillin intramuscularly given on the operating-table.
- (ii) **Three hours later**—sodium penicillin in a slow intravenous drip at the rate of 5,000–6,000 units an hour; continued for 24 to 48 hours.
- (iii) The usual dose of polyvalent antitoxin (50,000–100,000 I.U.) was given intravenously, and repeated if necessary.

In our experience\* this was found satisfactory. Little difficulty was encountered in giving the penicillin in a continuous drip transfusion. No reactions were observed, and the results were most encouraging.

### Prophylaxis with Antitoxin

The routine use of antitoxin as a prophylactic was recommended in Italy, the suggested dose being 16,500 I.U. of the

\* These observations were made in conjunction with Lieut.-Col. J. S. Jeffrey, Surgical Penicillin Officer, who is continuing the work.

polyvalent antitoxin, given intramuscularly to casualties considered prone to gas gangrene—i.e., those with severe wounds of the buttock, thigh, or shoulder, with compound fractures of the femur, or with penetrating wounds in which primary surgical treatment had been delayed more than 24 hours. From personal observations and from a knowledge of the amount of antitoxin used, we feel confident that these instructions were conscientiously carried out.

Between 13 and 14% of all battle casualties received prophylactic antitoxin. This figure, which is rather higher than had been anticipated, is based on an analysis of the operation books and records of nine surgeons who were working in the forward areas throughout the period in question, and involves 2,438 entries. There is no reliable information concerning the average time between wounding and the administration of the antitoxin, but since antitoxin was never given in front of the forward surgical centres, some estimate can be made on the basis of the average operative delay. The limiting times in the present series were 5½ hours and 3 days 6 hours, but the great majority of the patients were first seen by the surgeon in the 12-24 hours period after wounding. From a single run of 256 casualties admitted in a 36-hours period to one C.C.S., 26 received prophylactic antitoxin at an average time of 20 hours after wounding, and this is probably a very fair figure for the entire campaign.

It was not possible, in field conditions, to obtain the data which would show whether the administration of antitoxin had reduced the incidence of gas gangrene among those who were most likely to develop it, but one very interesting fact was observed. Full details are available concerning 75 out of the 78 cases occurring in the Eighth Army between Sept. 1 and Dec. 31, 1943. In 34 patients who received prophylactic antitoxin the mean incubation period of the disease was 68 hours; in 41 patients who had not received antitoxin (presumably because they were not considered likely to develop gas gangrene) the mean incubation period was 33 hours. This marked increase in the incubation time of the disease in the patients who had received antitoxin is at least indicative of the value of prophylaxis, particularly in view of the delay in administration; it may be recalled that the decrease in the incidence of tetanus upon the introduction of prophylactic tetanus antitoxin was accompanied by an increase in the incubation time in those who developed the disease.

#### Summary

Cases of gas gangrene occurring in the Central Mediterranean Force between July, 1943, and February, 1944, have been studied both in the field and by an analysis of Army Form I 1241.

The fatality rate, which was high in Sicily and in the early part of the campaign, fell sharply in December, 1943. It has been shown that this fall was coincident with an improvement in the general standard of treatment.

The case-fatality rate was lowest among those who received within 6 hours of diagnosis both surgical treatment and an intravenous dose of at least 50,000 units of polyvalent antitoxin.

Some evidence indicative of the value of antitoxin as a prophylactic has been presented.

Thanks are due to the D.G., A.M.S., for access to the case reports, to D.D.M.S. and Consulting Surgeon, Eighth Army, for the granting of facilities for the field investigation, and to Dr. E. Lewis-Fanning for his help with the analyses.

#### REFERENCES

- Macfarlane, M. G. (1943). *British Medical Journal*, 2, 636.
- MacLennan, J. D. (1943). *Lancet*, 2, 63, 94, 123.
- (1944a). *Ibid.*, 1, 203.
- (1944b). *In the press.*
- Pulvercraft, R. J. V. (1943). *Lancet*, 2, 1.
- Wiles, P. (1944). *Ibid.*, 1, 523.

## FRACTURE OF THE CARPAL SCAPHOID

BY

JEFFREY M. ROBERTSON, M.B., B.S.

*Surg. Lieut.-Cmdr. R.N.V.R.*

AND

R. D. WILKINS, M.R.C.S., L.R.C.P.

*Surg. Lieut., R.N.V.R.*

In the practice of the fracture clinic at a Royal Naval hospital during two and a half years of war we have been impressed by the frequency of fracture of the carpal scaphoid in the young healthy adult male. This article is an analysis of our experience of this lesion. We also make a very strong plea for the recognition of this important drain on man-power. By early diagnosis and adequate treatment prolonged disability can be avoided and many useful men returned to duty who otherwise would waste many months in invalidism. Wilson states that 86% of carpal injuries involve the scaphoid. Hook and Boone (1936), of the United States Naval Service, in their analysis quote figures of one in ten compared with other carpal injuries. Unfortunately most recorded figures do not state the types of lesion included. Our own series includes only fractured scaphoids and Colles fractures.

In the period under review there have been treated at this hospital 100 fractured scaphoids, compared with 58 Colles fractures. The patients have all been sailors or airmen between the ages of 17 and 50, the average age being 27 years. Many of these men had received an injury at sea or on an isolated station with no facilities for radiological examination. We would urge that had they all been treated as possible fractures from the start and been immobilized, much loss of valuable time would have been avoided.

#### Aetiology

Scaphoid fracture has almost always been caused by a fall on the outstretched hand or a forced and unguarded dorsiflexion of the wrist. A number of cases have come to our notice with a history of recent injury but with the radiological findings of an old ununited fracture of the scaphoid. These men had been able to carry on for years with no other symptoms than a slight weakness of the wrist. It is considered that the real cause of their disability is the lighting-up of osteo-arthritis consequent on their original injury, rather than on the fracture *per se*.

#### Symptoms and Signs

These may be no more than a "sprain" of the wrist, and herein lies the potential danger of overlooking a fracture. It is a platitude, for the repetition of which no apology is given, that all sprains should be x-rayed if possible and all doubtful cases treated as fractures.

The nearest approach to classical signs of scaphoid injury are pain, tenderness, and swelling in the "anatomical snuff-box." Another sign sometimes obtained is pain on percussion of the tip of the thumb held in extension. In the presence of these signs, even if the radiological findings are negative, nothing is lost by immobilization for a fortnight in plaster-of-Paris. Radiological examination at the end of this time will clearly demonstrate a fracture if present, and a very valuable fortnight of immobilization will have been gained.

#### Radiology

These fractures can be extremely difficult to demonstrate, especially in the early stages. It is our practice to take four views of the bone—i.e., antero-posterior, lateral, and the two obliques. The commonest site of injury is across the waist of the bone, and it is here that a most careful search must be made.

The earliest lesion may show only a "hair-line" crack. This can sometimes be made more obvious by forced ulnar deviation of the wrist, which tends to open the crack in the scaphoid by the pull of the medial collateral ligament. After ten days the crack may become more obvious owing to the physiological hyperaemia of repair producing osteoporosis. Herein lies the importance of a later radiograph in doubtful cases of sprain. This osteoporosis may in a small number of cases progress to

R. C. Murphy (*New Engl. J. Med.*, 1944, 280, 69) records a case of Stevens-Johnson's disease—an eruptive fever involving the mouth and eyes, described in 1922. It is characterized by an acute, sometimes fulminating, onset with fever and prostration, erythematous generalized rash, and severe stomatitis followed by sloughing. With occasional exceptions the conjunctivae are involved. The usual period until resolution of the skin lesions is about three weeks. Nothing has been revealed by laboratory examination. The age limits are 22 months to 16 years. With rare exceptions the disease is confined to male children.

a cystic appearance in the middle of the bone (Fig. 1), and should be completely reossified before union can be considered secure. It should not be mistaken for a similar cystic appearance throughout the bone which is sometimes seen in men who use traumatizing tools—e.g., pneumatic road drills or

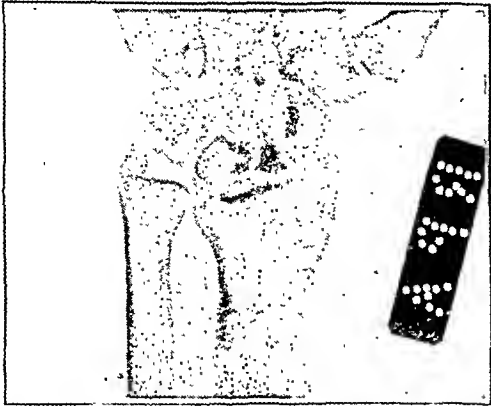


FIG. 1.—Typical cystic appearance sometimes seen in the fracture line during the process of repair, due to hyperaemic decalcification.

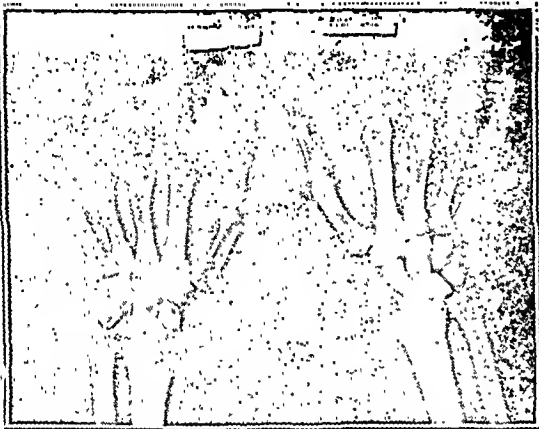


FIG. 2.—Multiple carpal cysts with pathological fracture of right carpal scaphoid. Patient a dockyard worker who had used a small pneumatic drill over a long period. Drill required support of right hand only. No bony abnormality of left carpal bones.

riveting machines (Fig 2). A less common and not so important injury, demonstrated radiologically, is a separation of the tubercle of the scaphoid.

In cases with delayed union varying degrees of avascular necrosis of the fragments, sclerosis of the fracture edges, and osteo-arthritis will be demonstrated. This necrosis must not be confused with the avascularity of the proximal fragment compared with the osteoporosis of the more richly vascularized distal portion of the bone that is sometimes seen. This imbalance is noted chiefly at about the second month, and tends to be restored as healing proceeds. In cases in which union has been long delayed this avascularity may persist and remain with consequent destruction of the articular cartilage and the laying of the foundations of osteo-arthritis.

Treatment

It has been our practice to immobilize in plaster-of-Paris all cases of suspected scaphoid injury. This routine is carried out in both the early and the late cases, whatever the radiological findings may be. By adopting this measure early cases are not overlooked, and those late cases that will unite with immobilization are given a chance of doing so. As stressed by Watson-Jones, this immobilization must be adequate and continuous, and be prolonged until either complete union has taken place or non-union has become established.

The type of cast used is an unpadded plaster from the upper forearm to the metacarpal heads. Slight dorsiflexion,

with the thumb in line with the long axis of the radius and slight radial deviation, is the position of choice (Fig. 3). For a period we exaggerated these positions, as recommended by Buxton, but found that thereby the discomfort of the patient was considerably increased without there being a corresponding improvement in healing-time. The first metacarpo-phalangeal joint is immobilized, and on the palmar surface the plaster is brought only to the proximal crease in order to allow full flexion of the fingers. Care is taken to mould well into the palm to ensure no movement in the carpus.

At this point we would stress the importance of impressing on patients the need for continuous immobilization. The least crack or weakening of the plaster must be at once reported and put right.

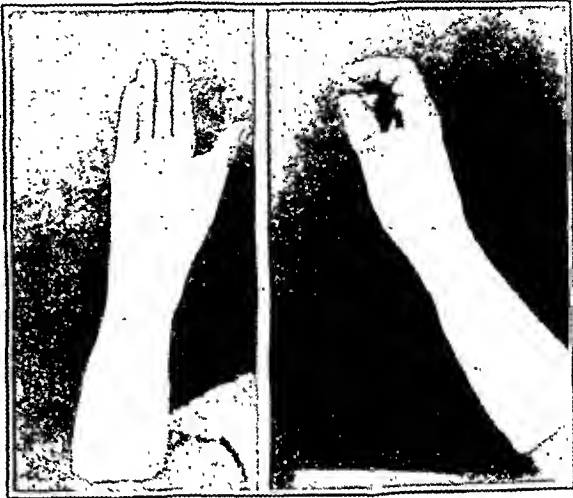


FIG. 3.—Type of cast and position of thumb.

Results

Of our cases 52 were diagnosed and treated within seven days of injury, and all of them had clinical and radiological union, with an average period of immobilization of 11.16 weeks (Table 1). All cases were checked by further radiological examination a fortnight after removal of the plaster.

TABLE 1.—Results of Plaster Treatment

	No. of Cases	Union	Non-union
Treated within 7 days of injury	52	52	
United plaster-of-Paris only; average time, 11.16 weeks			
Treated after 7 days of injury	48	13	
United plaster-of-Paris only; average time, 26 weeks			
Ununited:			2
Severe osteo-arthritis and invalided ..			3
No osteo-arthritis and sent to duty ..			12
Slight osteo-arthritis and sent to light duty ..			8
Operation and duty or light duty ..			3
Operation and invalided ..			1
Operation disposal unknown ..			6
Final state and disposal unknown ..			
	100	65	35

Of the remaining 48 cases—all of which were seen at periods ranging from one week to several months or even years after injury—a further 13 united with plaster only, but with an average immobilization period of 26 weeks. The longest period of immobilization resulting in union was 60 weeks. Patience in this case was indeed a virtue well rewarded. Established non-union occurred in 29 of these late cases. By this we mean radiological separation of the fragments with marked sclerosis of the fracture edges (Fig. 4). This may often be associated with avascular necrosis of the proximal fragment. Of these cases, two were discharged from the Service as unfit for any further work involving the wrist. Details of these two cases are given to show the lamentable story which may follow a missed diagnosis of this very amenable lesion.

**Case 1.**—This patient, aged 41, was diagnosed as having a fractured scaphoid five months after injury. Two and a half years' immobilization in plaster was employed, during which three unsuccessful bone-graft operations were performed at an E.M.S. orthopaedic hospital. Advanced osteo-arthritis and severe disability resulted.

**Case 2.**—The patient, aged 37, was first seen five years after injury. There was then a good deal of sclerosis, and non-union had resulted. The wrist was immobilized for 40 weeks with no improvement, and osteo-arthritis and severe disability resulted.

In three cases of non-union the men were discharged to full duty. These were all late cases, but had been fortunate in having a good range of movement and no osteo-arthritis.



FIG. 4.—Established non-union with marked sclerosis of both fragments and early osteo-arthritis change.

changes. In 12 cases of established non-union which had no other treatment than prolonged immobilization the men were discharged to light duty. Most of these cases showed some degree of osteo-arthritis and disability of the wrist; these patients were all men who were especially valuable to the Service by reason of technical knowledge and experience.

Twelve cases of non-union received operative treatment. These operations were performed at various hospitals; the results are set out in Table II. It will be noted that union was obtained in a further five of these cases; two had osteo-arthritis changes. Three of the five returned to duty; one was invalided owing to the severity of the disability; and the disposal of the fifth is unknown. The two cases of excision of the proximal fragment developed osteo-arthritis, but were fit for further service. Of the remaining five, two had to be invalided with non-union and arthritis and three went to light duty with non-union and arthritis.

TABLE II.—12 Operation Cases

Type of Operation	No.	Total Treatment Period	Result	Osteo-arthritis	Disposal
Bone graft	3	(i) 32 weeks	Union	Absent	Duty
		(ii) 40 "	"	Present	Invalided from Service
		(iii) 52 "	Non-union	"	
Excision of proximal fragment	2	(i) 20 weeks	"	"	Duty
		(ii) Not known	"	"	Light duty
Drilling	7	(i) 32 weeks	Non-union	"	Light duty
		(ii) Not known	"	"	Invalided
		(iii) 36 weeks	Union	Absent	Duty
		(iv) 68 "	"	Present	Invalided
		(v) 16 "	Non-union	"	Light duty
		(vi) 16 "	Union	Absent	Not known
		(vii) 20 "	Non-union	Present	Light duty

Thus it is shown that operative treatment is essentially a last resort and the results may be disappointing. The chief reason for this is the apparent inevitability of osteo-arthritis changes.

The records of the remaining six cases of the series cannot be traced, and they are included only to show the relative frequency of the scaphoid lesion in wrist-joint injuries.

TABLE III.—Final Results in the Series of 100 Cases

United	Disposal:	Cases
73	27	100
Returned full duty	72	
Returned light duty	16	
Invalided	5	
Final disposal unknown	7	

#### Multiple Carpal Fractures associated with Fractured Scaphoid

Two cases were associated with Colles's fracture of the lower end of the radius. There was one case of bilateral fracture of the scaphoid caused by falling backwards on to both wrists. One united in three and the other in four months. There was one case of fracture of the tubercle of the scaphoid together with fracture of the os magnum. Sound union occurred in nine weeks. One case of fracture of the body of the scaphoid occurred together with fracture of the trapezium and trapezoid. Prolonged immobilization was unsuccessful, and osteo-arthritis of the carpus resulted. One fractured scaphoid tubercle was associated with a Bennett's fracture, and both united in six weeks.

An unusual case was seen in a man aged 35 whose case was diagnosed one week after injury as a fracture of the waist of the scaphoid. After three months' immobilization union had taken place. He continued to have a painful wrist, and two months later developed a cold abscess in the region of the scaphoid. This was aspirated and proved to be tuberculous. There were radiological findings of tuberculous disease of the scaphoid, and he was transferred to an E.M.S. hospital for further treatment.

#### Summary

An analysis of 100 cases of fractured scaphoid in a continuous series of 153 wrist-joint injuries is given.

The importance of not overlooking injury to the carpal scaphoid in young adults with "sprained wrist" is stressed.

The value of early and adequate plaster-of-Paris immobilization is proved, and a plea is urged for early plaster even in the absence of radiological facilities or positive diagnosis.

Operation in a small number of late cases may preserve some utility in the affected wrist.

We wish to thank Surg. Rear-Admiral Twigg for kind permission to publish this paper. We are also very grateful to Miss Irene Lindsay, V.A.D., for invaluable assistance in collecting and compiling our records, and are indebted to Surg. Cmdr. Pankridge for his assistance with the radiology.

#### BIBLIOGRAPHY

- Butler, A. A. (1942). *Proc. Roy. Soc. Med.* 35, 760.  
 Hook, F. R., and Boone, J. D. (1936). *U.S. Navy Med. Bull.*, 34, 172.  
 Rothberg, A. S. (1942). *Amer. J. Surg.* 59, 611.  
 Soto-Hall, R., and Haldeman, K. O. (1934). *J. Bone & Surg.* 16, 822.

## EPIDEMIC INFECTIVE HEPATITIS IN GLOUCESTERSHIRE

BY

J. S. COOKSON, M.D., D.P.H., Barrister-at-Law  
Deputy County Medical Officer of Gloucestershire

Although infective hepatitis is not at present a notifiable disease, as many as 246 cases were reported in Gloucestershire during 1943. Most of these occurred in children attending elementary schools, the remainder in children in residential nurseries; and the behaviour of the disease was so different in the two types of community that it seemed worth recording. It is hoped that the outbreaks in residential nurseries will be of some epidemiological interest, since children and staff seem to make, so far as is practicable, a closed-herd community. Lisney (1937) and Newman (1942) have described outbreaks in schools, and Evans (1942) and Hallgren (1942) have recorded outbreaks in institutions which are practically closed communities.

#### Observations

##### (a) Elementary Schools

From elementary schools with a total attendance of 40,000 the number of cases of infective hepatitis reported during the

year was 224. These cases were distributed among 59 schools. The usual means of spread was exemplified by an outbreak at Picklenash School, Newent, where out of 411 children some 46 were infected during the year. In the early stages only occasional single cases occurred at intervals of one or several months (when the infection was presumably smouldering), and it was not until April, 1943, that the outbreak took on epidemic proportions.

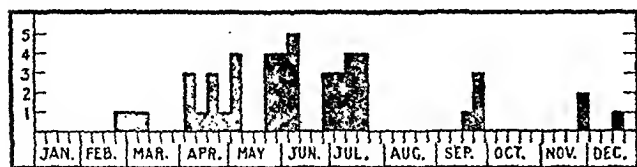


Chart of weekly incidence of cases at Picklenash School, Newent.

The epidemic ran its course in much the same manner as other recorded outbreaks. The infection was scattered throughout all classes, and no particular age group and neither sex was specially affected. The incubation period, determined from the onset of the first case to the next one in the same family, was about four weeks. It is, of course, realized that an incubation period determined in this way is only the maximum, since clearly the first case was infectious after the onset of symptoms and signs. In accordance with regulations, the head teacher excluded home contacts for four weeks from the date of last contact with a case before the latter's release from isolation. In addition he used his discretion in regard to suspicious cases, usually excluding these for a week and then readmitting them if no jaundice had developed.

#### (b) Residential Nurseries

Outbreaks of epidemic infective hepatitis occurred in two residential nurseries, and the infection attacked the children in an entirely different manner from that noted in the elementary schools. In the Stanley Park Residential Nursery no cases had previously been recorded, and then suddenly, out of a population at risk of 41 children and 16 staff, some 9 children were affected within the course of 14 days.

TABLE I.—Stanley Park Residential Nursery

Case	Sex	Age	Date of Onset	Vomit	Diarrhoea	Constipation	Jaundice: Day of Onset	Dark Urine	Pale Stools
1	M	4	2/10/43	+	—	+	3	+	+
2	F	3	4/10/43	+	—	—	3	+	+
3	M	1	6/10/43	+	—	—	4	+	+
4	M	1	7/10/43	+	—	—	1	+	+
5	M	2	8/10/43	+	—	—	2	+	+
6	F	3	9/10/43	—	+	—	1	+	+
7	F	2	12/10/43	—	+	—	1	+	+
8	F	2	14/10/43	—	+	—	3	+	+
9	F	2	15/10/43	+	—	+	4	+	+

In the Bownhill Farm Residential Nursery no cases had occurred previously, and then, out of a population at risk of 25 children and 11 staff, 11 children and 1 of the staff were affected within 11 days. No other cases occurred other than

TABLE II.—Bownhill Farm Residential Nursery

Case	Sex	Age	Date of Onset	Vomit	Abd. Pain	Diarrhoea	Constipation	Jaundice: Day of Onset	Dark Urine	Pale Stools
1	F	3½	10/11/43	—	+	—	—	5	+	+
2	F	3	11/11/43	+	+	—	—	4	+	+
3	F	3	11/11/43	+	+	—	—	1	+	+
4	F	4	12/11/43	+	+	—	—	1	+	+
5	M	4	14/11/43	+	+	—	—	3	+	+
6	F	4	15/11/43	+	+	—	—	3	+	+
7	F	3	18/11/43	+	+	—	—	3	+	+
8	M	2	19/11/43	—	+	—	—	3	+	+
9	M	2	21/11/43	—	+	—	—	3	+	+
10	F	2	21/11/43	—	+	—	—	3	+	+
11	M	3	21/11/43	—	+	—	—	2	+	+
12	F	1	21/11/43	—	—	—	—	2	+	+
13	F	17	7/12/43	—	—	—	—	6	+	+

a member of the nursery staff who developed the disease about a month after the onset of the last case among the children.

#### Clinical Course in Residential Nurseries

The children in the nurseries could be kept under close observation, and it was possible to make a day-to-day record of the course of the disease. In most cases there was no difficulty in diagnosis: typically the illness started with an attack of vomiting and a moderate rise of temperature, but in one case the temperature rose to 106.8° F. Dark urine and pale stools were usually present the day before the jaundice appeared. This generally developed about the third day of the disease, but in some cases it appeared as early as the first day and in others as late as the seventh day. When the children developed jaundice they usually began to feel better. A rash was not uncommonly present. As a rule this was urticarial, probably caused by scratching as a result of skin irritation, but in a small number of cases a maculo-papular rash appeared across the back of the shoulders on the sixth day and later extended to the abdomen. The rash came out quickly, and faded gradually over several days.

#### Epidemiological Features

##### (a) Elementary Schools

For several years occasional sporadic cases of infective hepatitis have occurred in widely separated parts of Gloucestershire, but not until 1943 was the incidence in any one place so high as to merit the disease being described as epidemic. Since the disease is not notifiable, the recorded cases form only a small percentage of the total number, as the disease was widespread and school-children were by no means the only age group affected, but they give a general indication as to distribution. In the urban areas the disease did not seem as prevalent as in the more sparsely populated areas. Two new factors, however, have possibly facilitated its rapid dispersal—the fact that in many villages war workers are now taken from their homes to their factories each day by motor-bus, and also that the older children are collected from their homes and taken to senior schools daily.

No difference clinically was noted between the sporadic and the epidemic cases. When the first case occurred in an elementary school there seemed to be no way of telling whether it would be the only case or whether a substantial number of other children would be affected. Presumably this fluctuation in attack rate must be due to the children's degree of susceptibility to infection and to some local environmental factors, which together favour or limit the spread.

In the outbreaks in the elementary schools the infection ran its anticipated course. Cases cropped up fairly regularly at approximately monthly intervals with occasional gaps of two months, infection presumably being from case to case with an incubation period of one month, missed or subclinical cases filling the gaps; this is not surprising in view of the mildness of some cases (Newman, 1942). This series of cases was, however, not at all the type to be expected if the infection was waterborne.

##### (b) Residential Nurseries

As has been stated, in both residential nurseries the outbreaks ran courses entirely different from those recorded in the elementary schools. In the Stanley Park Residential Nursery many of the children had suffered from an unfortunate outbreak of stomatitis about a month before the first case of infective hepatitis. But the children who subsequently had infective hepatitis were not necessarily those who earlier had stomatitis. Attention is drawn to this, since other epidemics have been associated with certain nasopharyngeal conditions. Glover and Wilson (1931) describe an outbreak associated with sore throats, and McFarlan (1941) records an outbreak associated with measles. Assuming the usual long incubation period of one month (Pickles, 1939), it is impossible to explain this type of outbreak on the basis of case-to-case spread. It seems much more probable that the children received the pathogenic agent from a common source. The outbreak might be described as explosive. Superficially it had certain resemblances to a waterborne spread, but examination revealed the water to be of a satisfactory quality. After considerable

difficulty, information was elicited that a mother had visited the nursery 34 days before the onset of the first case. She had recently had jaundice, and had only been discharged from hospital several days previously. She spent a short time one afternoon playing with the children at the nursery, and it would seem probable that all the cases were infected from this one source. This degree of infectivity, even associated with a susceptible child population, is most striking.

In the outbreak at Bownhill Farm Residential Nursery there was again a resemblance to a waterborne epidemic. It seemed probable that the children had received the pathogenic agent from a common source, but I was entirely unable to trace a contact, either direct or indirect, with a known case of infective hepatitis. On examination of the water and the source of supply a remarkable state of affairs was found to exist. The water was gathered by pipes to a collecting chamber from three sources—A, B, and C. Sources B and C were still active, but source A had practically dried up. At the collecting chamber a pumping engine had been installed which pumped the water from sources B and C up the pipe to source A, which was now used as a reservoir, giving the necessary gravitation for the house supply. Since this source A was situated in a midden it was not surprising that the water showed a considerable degree of pollution. The gathering-ground of all three sources was carefully examined; but no human beings lived there, and only cattle and sheep were pastured on the ground. All that could be discovered was that the water was badly polluted, and further evidence would be required to show that this was the cause of the outbreak. Although an outbreak of waterborne epidemic infective hepatitis has been described by Hallgren (1942), it would need far more evidence than mere pollution of the water to prove conclusively that the children at Bownhill Farm Residential Nursery were infected by the water supply. There is also the marked similarity to the outbreak at Stanley Park Residential Nursery, where the disease was shown to be introduced by an infected person.

#### Summary and Conclusions

A short epidemiological account is given of 246 cases of infective hepatitis which occurred in Gloucestershire in 1943.

An outbreak is described in an elementary school, where the infection ran its expected course.

This is contrasted with the outbreaks in two residential nurseries, which were explosive in type, infection probably being from some common source.

In one residential nursery the source of infection is presumed to be an infectious visitor, 34 days before the first case.

In the other residential nursery no such contact was found; the possibility of the infection being waterborne is discussed, but is rejected.

A brief clinical account is given of the children infected with infective hepatitis in two residential nurseries.

I am indebted to Dr. H. K. Cowan, County Medical Officer, for his help and for permission to publish the results of these investigations.

#### REFERENCES

- Evans, P. (1942). *British Medical Journal*, 2, 446.  
Glover, J. A., and Wilson, J. (1931). *Lancet*, 1, 722.  
Hallgren, R. (1942). *Acta med. scand. Suppl.* 140, 53.  
Linnar, A. A. (1937). *British Medical Journal*, 1, 703.  
McFarlan, A. M. (1941). *Publ. Hlth.* 55, 56.  
Newman, J. L. (1942). *British Medical Journal*, 1, 61.  
Pickles, W. N. (1939). *Lancet*, 1, 893.

The Surrey Hospitals Divisional Council, formed under the auspices of the Nuffield Provincial Hospitals Trust, has widened its area to include the county borough of Croydon, four of whose representatives now participate in the Council's work. This inclusion has eased the task of the Planning Committee, which has issued a draft scheme for the co-ordination and extension of the hospital services in the county. The scheme includes key, main, and local hospitals, specifying the proposed functions of each and suggesting the minimum services and departments which might reasonably be expected. The greatest shortage of accommodation is in the north-west section of the Council's area, where no hospital exists which could perform the functions of a main hospital. The draft plan has been sent to the constituent bodies—that is, the various hospitals in the county, the local authorities, and a number of voluntary organizations, central and local—for their observations. A survey of maternity accommodation and of special hospitals is now being undertaken.

## EXPERIMENTS ON SCABIES PROPHYLAXIS

BY

KENNETH MELLANBY, Sc.D.

Major, R.A.M.C.

With our present knowledge there should be little difficulty in treating and curing all cases of scabies as soon as these are diagnosed, but a great advance would be made if we could discover a method of scabies prophylaxis which would prevent infection from taking place. Farmers have long been faced with a similar problem, and infestation of sheep by mites is kept under control and has even been completely eliminated in some countries by universal "dipping." So far it has not been possible to devise anything so satisfactory that is practicable for use with man, though Percival (1942) has suggested that the whole population of Britain might be simultaneously treated with sulphur ointment to try to eradicate the disease. For prophylaxis some method is needed which is safe, efficient, simple, and cheap.

An experiment was made to try, against human scabies, a standard sheep dip supplied by the Cooper Technical Bureau, as this is inexpensive and could be made available in large quantities. Having previously determined that immersion for three minutes could be well tolerated by most individuals, two men suffering from scabies were immersed for that period in a bath of sheep dip at a temperature of approximately 20° C. and then the liquid remaining on their skin was allowed to dry. Less than 50% of the mites were found to be dead after re-examination 24 hours later. As this method will not cure human scabies satisfactorily it can hardly be effective as a prophylactic. No doubt the satisfactory results obtained with sheep are due to the quantity of dip which remains in the wool and so in contact with the parasites.

I have little doubt that universal dipping with benzyl benzoate emulsion would prove completely successful in wiping out scabies. One experiment on these lines may be quoted. In a Midland mental hospital scabies presented a major problem among the female patients. Out of a sample of 183 which were carefully examined, 48 cases of scabies—i.e., 26%—were found. The treatment of scabies among these patients had presented a major problem to the staff for a long period. On two consecutive dates in September, 1942, the female patients (804 in all) were given a single treatment with benzyl benzoate emulsion, which was painted all over the body; the staff of the hospital were also very thoroughly examined and any positive cases treated. No bath was taken before the treatment. Since that date scabies has given no further trouble, and only a negligible number of cases had been found. This demonstrated conclusively that in a population showing a high incidence of endemic scabies a single treatment of all individuals will effectively wipe out the complaint; but, as will be shown below, it is essential that all the members of every household should be treated. Unfortunately there is available neither the benzyl benzoate nor the technical assistance to institute universal treatment, and, also, new legislation would be needed to ensure success.

We know that in human scabies the vast majority of the parasites are found on the hands and wrists (Johnson and Mellanby, 1942), and it was therefore thought that, instead of a universal programme of "dipping," it might be possible to obtain satisfactory results by treating this restricted area of the body with benzyl benzoate. Work on these lines was carried out among several groups, constituted as follows: (a) W.A.A.F. members of balloon crews; (b) school-children in a large county borough; (c) school-children in an urban borough; (d) school-children in what was technically a rural district but in which mining was the main industry. Unfortunately, Service requirements were such that the membership of the first group changed so frequently that no conclusive results could be obtained, but the school-children were all under observation for a considerable period.

#### Procedure with School-children

The same procedure was adopted for all the children concerned. On the first visit their hands and wrists were examined and those with *Sarcoptes* in burrows noted. In all these preliminary examinations it was possible to verify the diagnosis



y the removal of live parasites. The names of these children with scabies were reported to the School Medical Service, which took action regarding their treatment. Immediately after examining each child a quantity—approximately 1 c.cm.—of benzyl benzoate was placed on the palm of one hand, and this was rubbed into both hands and wrists without delay. This was repeated at approximately fortnightly intervals for twelve visits. Unfortunately for the possibility of assessing the experimental results in a simple manner, whenever a case of scabies was found it was necessary for it to be reported, and the child was excluded from school for treatment. This meant that the falling incidence might be due to two causes—either the action of the benzyl benzoate on the hands and wrists or the exclusion of chronic cases of scabies and the treatment of their families by the local health authorities. To try to get over this difficulty a "control" group of children was selected. Here the fortnightly inspections were made and infected children were excluded from school, but no prophylactic benzyl benzoate was used.

The results of this investigation, which incidentally necessitated over a quarter of a million individual examinations, are summarized in the accompanying Table. It will be seen that the incidence was reduced very considerably in every group.

Table showing Results of Visits and Treatment on the Incidence of Scabies

District	Number of Children Examined	Incidence of Scabies (%)		Final Incidence as Percentage of Original
		First Visit	Twelfth Visit	
(a) Benzyl Benzoate applied to Hands and Wrists				
County borough (industrial) ..	9,962	1.48	0.23	15
County borough (industrial and mining) ..	2,526	2.57	0.71	28
Rural " district (mainly mining) ..	536	2.10	1.13	54
(b) No Benzyl Benzoate applied				
County borough .. .. .	5,928	2.13	0.43	20

The most striking results were obtained from the county borough, and here the control group gives some further data. Considering the control group first, it is obvious that a great decrease in scabies was brought about merely by inspections, with subsequent treatment. A greater decrease took place in the group from the county borough where the hands and wrists were treated with benzyl benzoate. Dr. J. O. Irwin has kindly examined the detailed data of this experiment, and he finds that the decrease in incidence of the "treated" group was significantly greater than that of the "control"; but, even so, it is obvious that the extra trouble and expense of providing benzyl benzoate were very meagrely repaid.

#### Practical Conclusions from Experiment

The conclusion which may be drawn from this work with school-children is that frequent inspections by persons well used to recognizing scabies will serve to reduce the incidence of the disease very greatly provided that cases, when found, are treated speedily and efficiently, and provided that the whole family of each case is also treated. Even quicker results would be obtained, and many children would be saved from ever having scabies, if regular inspections could be made throughout the whole population. This may not be possible, but propaganda which will make people scabies-conscious and willing to seek proper treatment for themselves and their families as soon as they suspect scabies can have a similar result. Incidentally, the majority of the population seem still to rely on self-treatment with widely advertised "remedies" that are either quite useless or improperly used, so that no cure is produced and the spread of the disease continues (Graham, 1944).

One further point which emerges from this investigation is that it is very unlikely that children often contract scabies inside the school buildings. A statistical analysis of the incidence in the various classes reveals that cases were scattered entirely at random throughout each school without any significant concentration in any class. Furthermore, it was very rare indeed to find two cases of scabies in adjacent desks. There seems no doubt that scabies is caught out of school, mainly in the home, so that exclusion from school for this complaint is only essential because it is usually a necessary preliminary to ensuring proper treatment. If there is any delay

in starting the treatment then the child is unnecessarily deprived of a period of education.

The occurrence of scabies in the Services may give some clue to the possibility of preventing the spread of the disease in the rest of the population. Early in this war a great deal of scabies was found in the Army in Britain, and the incidence appeared to be higher than that among the civilian population. Further investigations showed that this was not in fact the case, and the discrepancy was due to the frequent medical inspection of soldiers, so that their scabies was discovered while civilians harboured the disease undetected. Furthermore, it seemed likely that most of the scabies in troops was derived from civilian sources and that little actual spread took place inside the Services. This view is supported by consideration of what happens among troops when abroad. Among British troops in North Africa, where there was very little contact between them and the civilian population, scabies was practically non-existent and only to be found among recent arrivals from this country. Among isolated troops with efficient treatment of cases as they arise the disease rapidly disappears. It must be remembered that scabies may have an "incubation period" of nearly two months (Mellanby, 1943).

The facts described in this paper indicate that prevention of scabies is by no means a simple problem. If we could treat the whole of any population with benzyl benzoate we could wipe out the disease, but this is practicable only among limited and isolated communities where the incidence is substantial. On the other hand, if we can treat only part of the population—e.g., soldiers on service without treating their families, or school-children without any treatment in the home—then complete control is impossible. Frequent inspections among a population aware of the danger of this disease, followed by proper treatment of the cases and all their contacts, seem the only universally satisfactory method. There is no short cut to the successful control of scabies.

#### Summary

Experiments necessitating a quarter of a million inspections of school-children suggest that scabies prophylaxis is not practicable, apart from the normal treatment of the disease. But frequent examinations by personnel experienced in the diagnosis of the disease will reveal numerous cases; their treatment and that of all contacts can rapidly reduce the incidence of scabies.

It is necessary to allow the districts in which this work was done to remain anonymous; therefore I cannot acknowledge personally my gratitude to the various local authorities, medical officers, and teachers whose co-operation made the investigation possible. Most of the examinations of children were carried out by pacifist volunteers who were subjects for various medical experiments at the Sorby Research Institute. The expenses of the investigation were met by the Ministry of Health and the Medical Research Council.

#### REFERENCES

- Graham, J. R. (1944). *British Medical Journal*, 1, 130.  
Johnson, C. G., and Mellanby, K. (1942). *Parasitology*, 34, 285.  
Mellanby, K. (1943). *Scabies*, Oxford War Manuals, London.  
Percival, G. H. (1942). *British Medical Journal*, 2, 451.

## Medical Memoranda

### A Case of Pneumococcal Meningitis Treated Successfully with Sulphathiazole

Although the recent literature contains records of the cure of pneumococcal meningitis by sulphonamides with or without serum, it was thought that the following case, successfully treated with sulphathiazole alone, might be of interest.

#### CASE RECORD

The patient, a postmaster aged 56, was in his usual good health when he retired to bed at 10.30 p.m. on May 8. At 2 a.m. next day he vomited, and at 4.45 a.m. was found in the lavatory in a dazed condition. He was put to bed, but became very restless and irrational, and at 6 a.m. was seen by his doctor and given morphine gr. 1/4. At 9.30 a.m. he was admitted to hospital, unconscious. On examination he was lying curled up on his left side, deeply stuporous and incontinent. His temperature was 100° F., there was slight neck rigidity, Kernig's sign was positive, and the pupils were small and equal and did not react to light. Apart from slight weakness of the right external rectus muscle, the cranial nerves appeared normal. The upper limbs were hypotonic but showed no paralysis; tendon-jerks were absent. The lower limbs were flexed, tone poor, knee-jerks diminished, and ankle-jerks present; the plantar response was extensor on the left side and flexor on the right. His pulse was 100, blood pressure 120/60; the apex beat

was half an inch outside the mid-clavicular line in the fifth intercostal space, and a few extrasystoles could be heard. Examination of the chest, abdomen, and ears revealed nothing.

Lumbar-puncture was performed and turbid fluid was obtained; pressure, 120 mm. water. It contained 2,000 cells per c.mm., of which 98% were polymorphonuclears. No bacteria were seen in a direct smear, but a Type 18 pneumococcus was grown in pure culture. A blood count showed a leucocytosis of 22,500, of which 83.5% were neutrophil polymorphonuclears. Treatment with sulphathiazole was begun at 4 p.m. on May 9. Since oral administration was impossible, the soluble sodium salt was given intravenously, the patient receiving 20 g. in 6 pints of glucose-saline in the first 24 hours. Subsequently oral administration was possible, and he received 18 g. by this route in the second 24 hours and 24 g. during the next 48 hours, making a total of 62 g. in 96 hours. After a restless night the patient improved considerably during the course of May 10, becoming fully conscious and fully orientated by 4 p.m.; his temperature was then 100° F. and eye movements were normal. On the 11th improvement was maintained; the pupils were normal and the chest clear. A herpetic eruption on the lips started at this time, becoming more severe and extending to the left cheek during the next two days; it was accompanied by stomatitis and glossitis. On May 14 the temperature had dropped to 98.4° F. and the C.S.F., which was under normal pressure, contained only a few degenerate polymorphonuclear leucocytes, and proved sterile even after cultivation in media containing *p*-aminobenzoic acid. The condition of his mouth was improving. On May 16 he had a shivering attack and, since recurrence is common in this disease, a further course of 30 g. of sulphathiazole was given during the next four days. He continued to improve, however, and by May 24 was convalescent. He was discharged well on June 14, and has since returned to work. A primary focus of his infection was sought, with negative results; a radiograph of the chest (May 25) and of the accessory air sinuses (June 3) revealed nothing abnormal, and no focus in the middle ear could be discovered.

I am indebted to Dr. W. A. Bullough, County Medical Officer of Essex and to Dr. O. W. Chapman, acting medical superintendent of the hospital, for permission to publish this case, as well as to Dr. C. F. Barwell, pathologist to the hospital, for the laboratory investigation.

C. GOING,

House-physician St. Margaret's Hospital, Epsom

## Treatment of Some Complications of Bacillary Dysentery

The sulphaguanidine treatment of bacillary dysentery has certain drawbacks. The drug is expensive and a large dosage is required; being an oral remedy, it is often precluded by vomiting in cases which need it most. Sulphapyridine has the advantage of being cheap, and it was found by Paulley to be at least as good as sulphaguanidine. More important is the fact that sulphapyridine and sulphathiazole have soluble salts which can be injected in urgent cases. That this advantage has not yet been exploited is due to the belief that the action of the sulphonamides in dysentery is exerted almost entirely within the lumen of the bowel.

We have now used sulphapyridine in the treatment of over 200 cases of bacillary dysentery in Lagos, injecting the drug intravenously in adults or intramuscularly into the scapular muscles in children whenever injection is indicated. Although our dysentery—practically all Flexner infections—might be expected to respond well to sulphonamides, it is often complicated by nutritional deficiencies of the vitamin B<sub>1</sub> complex. Gross signs of ariboflavinosis are very common in the adult population. Infantile pellagra ("kwashiorkor") is a deficiency syndrome of high mortality often occasioned by gastro-enteritis. Having found that undiluted milk could be taken with impunity as soon as sulphonamide therapy was established, we have given it in quantity to meet the demand for fluid and to supply the nutritional deficiencies. In urgent cases we have injected a crude liver extract to supply the B<sub>1</sub> complex. The results in simple cases were, as might be expected, invariably good. In complicated cases the combined therapy came well up to theoretical expectations.

The following cases illustrate our technique and results:

Case 1.—An African male aged 25. Admitted June 11, 1943.—Flexner dysentery of one-day duration. Stool greenish, watery, with lumps of blood-stained mucus; vomiting, tenesmus marked. On June 12 sodium sulphapyridine solution 1 g. given intravenously and 1 g. every hour orally. Next day motions were brown and semi-formed, and thereafter no motion occurred for 3 days.

Case 2.—An African male aged 5 months. Weight 7 lb. 3 oz. Admitted May 14, 1943, for vomiting and diarrhoea of one week's duration. Breast-feeding (test feeds showed only 2 oz.). Red tongue, emaciated, oedema of feet, and desquamation. Given astringent mixture and supplementary feeds. On May 17 stools still frequent, green, and slimy. Eyes sunken and staring; blinking absent. Sodium sulphapyridine 0.3 g. intramuscularly and sulphathiazole 0.5 g. every hour orally. On May 19 the stool was greenish and formed; eyelids blinked completely, but the child was drowsy—a condition which only too often precedes death in such cases. Two 2-cm. ampoules of exotrope were injected, after which improvement was rapid.

African Hospital, Lagos.

WILLIAM HUGHES, M.D., M.R.C.P.

## Reviews

### HISTORY OF SCIENCE

*A Shorter History of Science*. By Sir William Cecil Dampier, Sc.D., F.R.S. (Pp. 159, illustrated, 7s. 6d.) Cambridge: The University Press, 1944.

Sir William Dampier's *History of Science and its Relations with Philosophy and Religion* when first published in 1929 met with such immediate success that a second edition was called for in the following year. In 1942 he undertook the laborious task of bringing the work up to date. Then he was asked for a straightforward story of the growth of science reduced to its simplest terms, and has written this *Shorter History*. We must confess that on seeing a book of 189 pages we feared it could only present a catalogue of names and discoveries. But those fears proved groundless, and his two expressed aims have been successfully achieved. The first was to show how science, which now affects our lives so profoundly, reached its present predominance, the second was to place science in its appropriate relationship with other methods of thought. It is the story of man's attempts to understand the mysterious world in which he finds himself. He reminds us that "science did not germinate and grow on a healthy prairie of ignorance but in a noisome jungle of magic and superstition, which again and again choked the seedlings of knowledge," while placing it to the credit of Scholasticism that it prepared men's minds by teaching that the world was understandable.

Though we miss some of the engaging philosophical comments of the larger book, there are some pointed sayings, of which a few samples must suffice. "The aether, if there be an aether, is now crowded with 'wireless waves'—a consequence of Maxwell's equation—and however they are conveyed, it is certain 'not on the air'" (p. 104). "In the absorption spectrum of chlorophyll the maximum absorption coincides with the maximum energy of the solar spectrum, a remarkable adaptation, however produced, of means to ends" (p. 118). "It is impossible to predict the velocity of a particular molecule or the length of life of an individual man, but with a sufficient number of molecules or men we can deal with them statistically and say how many will move within certain velocities or how many will die within a given year. Statistical determination, but individual uncertainty" (p. 96). "To the behaviourist a man is only a nexus of stimuli and responses, because the method of investigation, by its own definitions and axioms, is merely the study of the relations between stimuli and responses" (p. 137). "Ritual is prior to and dominant over any definite belief. Compare this with some forms of modern psychology, which say, 'I react to outer stimuli, and so I come to think'" (p. 141). Sir William Dampier gives undeserved commendation to Capt. Cook for his researches on antiscorbutic remedies, whereas in fact Cook did nothing to help and a good deal to hinder the work of his ship surgeon in that direction.

The section on modern physics and astronomy is stiffer reading, and the ordinary reader may feel a sense of frustration at the admitted inability of the physicist to express his conception of matter in anything but mathematical equations. We are left with the discouraging conclusion that "a fundamental principle of uncertainty seems to lie at the base of our model of Nature," a change induced from the confident materialism of the last century, and due to the science which then seemed the most material—physics. But a healthy change, nevertheless.

A book worth meditating over, for it is the outcome of a well-stored and critical mind, with a capacity for distinguishing the essential from the incidental.

### MAN'S ESSENTIAL DILEMMA

*Conscience and Society: A Study of the Psychological Prerequisites of Law and Order*. By Ranyard West, M.D., D.Phil. (Pp. 260, 15s.) London: Methuen and Co., 1943.

This book begins and continues as a philosophical discussion and ends as something like a tract. The sequel is unusual and does at any rate as much credit to the author's heart as to his head. His principal thesis is that mankind's essential dilemma is between mutual co-operation and mutual strife, which he relates respectively to an instinctive tendency to co-operation on the one hand and to aggressiveness on the

other. His principal postulate, which he claims to deduce from general observation, is that the former tendency is uppermost and that aggressiveness is strong only in the neurotic, who, in Dr. West's conception, is by definition an individual suffering from the after-effects of disturbance of his emotional life after childhood. He starts with the hint, not subsequently so fully developed as such a fascinating task would make us wish, that the system of any philosopher is extremely dependent upon his personality and temperament, and in turn therefore upon complexes and the like which have arisen on the basis of his early experience. Hobbes, Loeke, and Rousseau are quoted as illustrative examples. Freud's philosophical excursions, based on his clinical experience, are held by the author to depend to a large extent on Freud's own difficulties with his own instinctive impulses. These speculations are reinforced by reference to clinical cases treated by the author.

The method of proceeding from philosophy to philosopher and thence to a philosopher who has betrayed his own inner processes to some extent in his psycho-therapeutic work (Freud), and finally to clinical cases is ingenious, but it leads to the narrow type of conclusion to which psychologists and psychiatrists are apparently fated. In this instance the conclusion is reached that it is predominantly the obsessional neurotics who are responsible for the woes of nations. Dr. West finds in short that wars depend essentially upon the failure of certain individuals to come to reasonable terms with their own individual conflicts. This is not a novel conclusion, but the author has reached it through a novel line of approach.

Though he quotes, a writer like Horney he does not seem to believe that the structure of the larger society has any particular responsibility in accentuating aggressive urges. Law in general is seen as a means of expressing the social or co-operative instinct and controlling the aggressive tendencies, but when he comes to the practical solution of the problem of war Dr. West does not help us much. The key to international co-operation is seen as the transfer of loyalty, power, and law from the sovereign States to a world community. From this he passes to an argument that would make all belligerents at the present time seem equally guilty. He even says, on page 238, "Ten years after this present war has ceased it will no more matter who 'caused' or who 'won' it than it did ten years after the last one"; and the book ends with something that reads curiously: "Make the great venture! agree with thine adversary—quickly! And place the consciences of the world behind its Total Society." Taken all in all, his conclusions are rather far away from his premisses. The author seems to be no more immune from unconscious personal bias than the generality of philosophers or indeed of mankind.

### WAR SURGERY

*Surgery of Modern Warfare*. Edited by Hamilton Bailey, F.R.C.S. Sub-editor for Medicine, C. Allan Birch, M.D. Compiled by 77 contributors. Part III, third edition (complete in six parts). (Pp. 178; illustrated. 15s., plus 6d. postage) Edinburgh: E. and S. Livingstone. 1944

Part III of the third edition of *Surgery of Modern Warfare* contains articles on the surgery of blood vessels, haemorrhage and its treatment, Thomas's splint and extension, plaster technique, and Braun's and Cramer wire splints. Perhaps the most outstanding contribution, however, is that on amputations by the late Sir William De Courcy Wheeler. This chapter was completed not long before he died, and many will no doubt agree that it ranks high among his contributions to surgical literature. Founded upon a wealth of experience, the sum of a life's work devoted to surgery, it is a masterly exposition from which all young surgeons may learn much. An editorial note at the end of this article tells us that Sir William had, from the beginning of the war, served as a consulting surgeon to the Royal Navy, and died in harness on Sept. 11, 1943. This chapter is "typical of his work and a fitting tribute to a great man."

Like the preceding volumes, this member of the series constituting the third edition maintains the high standard which we commended in our notice of the first parts of the third edition. The subjects included are written by well-known authorities in a clear and essentially practical manner, and are lavishly illustrated both by line and coloured drawings and by photographs.

### Notes on Books

*The Common Form of Niacin Amide Deficiency Disease: Aniacinamidosis*, by Dr. W. KAUFMAN, is published at Bridgeport, Connecticut, by the Yale University Press. This is an entirely uncritical monograph on a syndrome stated to have been discovered by the author and to be due to a deficiency of niacin amide—i.e., nicotinic acid amide or nicotinamide. He calls it aniacinamidosis. The symptoms run almost the whole gamut of those seen in general practice, from corns and fallen arches to grey hair and insomnia. Such varied symptoms as arthritis, impaired memory, lack of initiative, mental and physical fatigue, lack of appetite, foul breath, warts, dyspnoea, and ecchymoses are laid at the door of aniacinamidosis. So numerous are the manifestations listed that every hospital and private patient might be diagnosed as suffering from the condition. The reviewer finds it impossible to take this book seriously. Thus the author states that in five minutes nicotinic acid amide begins to relieve mental symptoms, improves apical heart sounds in fifteen minutes, and makes flabby muscles firm in half an hour. Such uncritical statements are found on opening any page of the book at random.

The official *Medical Register* for 1944 has been published on behalf of the General Medical Council by Constable and Co. (Orange Street, W.C.2) at 21s., post free 22s. The table printed in the introductory section shows that 3,532 names were added last year. New registrations numbered 1,501 in England, 611 in Scotland, 405 in Ireland, 153 on the colonial register, and 862 on the foreign register. The total number of names on the *Register* at the end of last year was 71,882, being 2,454 more than on Dec. 31, 1942. The total number at the end of 1933 was 56,741.

### Preparations and Appliances

#### A PLASTER OVER-BOOT

Surg. Cmdr. P. B. MORONEY, R.N.V.R., writes:

The protection out of doors of a walking plaster is essential. For use with such plasters, incorporating a sorbo or rubber heel, the following boot has been successfully issued from a narrow range of stock sizes. It may be rapidly extemporized in canvas and wood, although leather is more elegant and durable. It consists essentially of a simple leather sole-piece with a 1/8-in. heel cut to tracings of plasters corresponding to sizes 6, 8,

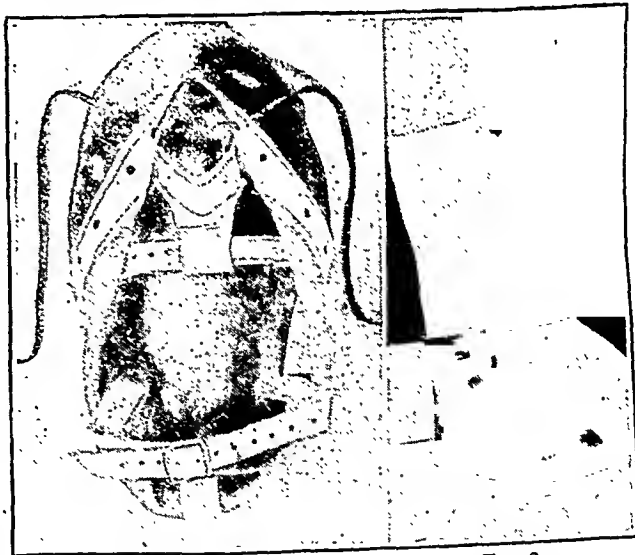


FIG. 1

FIG. 2

and 10 normal shoe fitting. Straps are sewn to it as illustrated in Fig. 1. They are designed to give close fitting posteriorly between the heel of the boot and of the plaster. The upper merely provides protection against weather and should be made capacious. It leaves from 1 in. of the toes, which need not necessarily be blocked; a counter in the heel is the only other refinement.

The correct attachment of the straps, which firmly brace the sole of the boot to the cast, is the essential; for then slight excess of length and breadth does not prejudice gait and permits a free action of the toes. The latter may be protected with a wollen toe-cap specially made or extemporized by cutting the end of a sock.

The boot applied is illustrated in Fig. 2. It may be noted that it is equally applicable to right or left foot.

## BRITISH MEDICAL JOURNAL

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## CONTROL OF GAS GANGRENE

Gas gangrene, with an incidence of 3 to 10 per 1,000 wounded and a case fatality of 30 to 70%, is still one of the uncontrolled infections of war. Its greatest prevalence and mortality occur at the beginning of any campaign, which aptly illustrates the old tag that only experience teaches. However, the tale twice or many times told may, like the dripping of water on the stone, make its impression in time, and we therefore offer no excuse for reiterating the general principles which should guide the surgeon in the prevention and management of this dreaded infection. With an incubation period measured in hours rather than days, the control of gas gangrene lies principally in the hands of the surgeon at the forward surgical centre. He must learn quickly to know the kind of wound which is most susceptible to clostridial infection—the extensively lacerated muscle injury, particularly of buttock and thigh; the wound contaminated with soil, clothing, or other foreign body; the compound fracture or other injury with its blood supply cut off—and he must realize that a delay of more than 24 hours in attending to any such wound increases enormously the risk of gas gangrene. Thus, American observers<sup>1</sup> found that among some 4,000 wounded soldiers sent to an evacuation hospital 5% developed gas gangrene, and, of these, 90% had symptoms of the infection before reaching the hospital, the average length of time between injury and operation being 41.8 hours. By contrast there was no case of gas gangrene among 349 severe non-transportable cases operated on within 24 hours of injury. The forward surgeon's main concern, therefore, must be prophylaxis, and the principal lesson which the Mediterranean campaigns have driven home is that bold and radical surgery is still the first and best line of attack. The high fatality rates in Sicilian and early Italian battles noted by MacLennan and Macfarlane on another page in this issue were probably attributable more to inadequate surgery by inexperienced men than to any other single factor, and a high duty rests on senior surgeons to see that the front-line surgery is in capable hands.

Where thorough débridement is not possible at the advanced unit, as may happen during the height of battle, free incision to open dead spaces and relieve tension will accomplish much, particularly if, at the same time, the patient is given the benefit of prophylactic antitoxin and antiseptic. Polyvalent gas-gangrene antitoxin had an inauspicious send-off in the early days of this war, and was perhaps unduly overshadowed by the high hopes entertained for the use of sulphonamides in both prophylaxis and treatment. Even now the prophylactic value of antitoxin is hard to assess, and, as the present report shows, it may by itself fail to prevent gas gangrene; but even

when given as late as 24 hours after wounding it delays onset (average incubation period of those receiving prophylactic antitoxin was double that of those without it), and so allows more time for effective surgery. The present prophylactic dose contains 9,000 units of *Clostridium welchii* antitoxin, 4,500 units of *Cl. septicum* antitoxin, and 9,000 units of *Cl. oedematiens* antitoxin, and should be given intravenously wherever possible. That antitoxin given before there is any evidence of clinical infection should fail to protect may be a disappointment to the experimentalist, but it must be remembered that antitoxin *per se* will not prevent multiplication of the organism in necrotic tissue, and the prophylactic dose, adequate as it may seem, will in time be neutralized by the rapidly manufactured toxin. It is here that chemoprophylaxis should play its part by preventing bacterial growth, and now that more effective substances, such as the sulphathiazole-proflavine<sup>2</sup> mixture, are becoming available, much may be expected from the combined use of antitoxin and drug, both in prophylaxis and in treatment. It is to be hoped that controlled field trials of these various prophylactics may be possible in the approaching battles.

The surgeon's second responsibility is to recognize the early signs and symptoms of gas gangrene: the feeling of weight and the increasing pain in the wound area due to oedema and swelling; the rising pulse rate; the change in the patient's mental attitude; tenderness round the wound, with a thin watery discharge, later becoming profuse and sero-sanguineous. Gas at this stage is often absent, and, as MacLennan<sup>3</sup> has pointed out, where there is much gas formation without other evidence of muscle infection the condition is almost certainly not gas gangrene. The peculiar sweetish odour regarded by some surgeons as pathognomonic of gas gangrene may be absent, particularly in oedematiens infection, while discoloration of the skin is rarely present in the early stages. These symptoms may be considerably masked by a persistent "shocked" condition, which must be treated urgently with blood or plasma transfusions and is no bar to surgical intervention. The surgeon will soon learn to recognize the typical muscle changes at operation—at first oedema and pallor, later loss of contractility, absence of bleeding from the cut surface, and a brick-red colour with gas bubbles between the muscle fibres—and he may with more experience be able to differentiate infections due to the different anaerobes (see MacLennan<sup>3</sup>). With infection established, excision of the infected muscles becomes an urgent matter, and the young surgeon will find useful advice on the technique of surgical excision and the treatment of gas gangrene in the revised M.R.C. War Memorandum No. 2. But good surgery is not good enough if it is done too late or without the help of antitoxin, for, as MacLennan and Macfarlane show, surgical excision later than 6 hours after clinical onset, along with inadequate antitoxin, doubles the case fatality compared with early surgery and adequate serotherapy. The immunologist is inclined to be pessimistic about antitoxin therapy, because toxins once formed quickly become attached to susceptible and usually vital tissue, but there is now good evidence that

<sup>1</sup> McIntosh, J., et al., *Lancet*, 1944, i, 591.<sup>2</sup> *Lancet*, 1943, ii, 63, 94, 123.<sup>3</sup> *U.S. Hist. of the World War, Med. Dept., U.S. Army, Wash., 1929, 12, 413.*

intensive serotherapy is of real value in reducing the mortality of established gas gangrene. The *minimum* therapeutic dose is 3 ampoules of the polyvalent antitoxin given as early as possible (that is, before operation) in concentrated bulk intravenously, and repeated every 4-6 hours if there are signs of persistent toxæmia. Nothing else, not even penicillin, can take the place of antitoxin at this stage, though antitoxin along with penicillin or other chemotherapeutic drug is likely to be better than antitoxin alone. The synergistic action of antitoxin and antibacterial agent has been well established experimentally, but in dealing with the clinical infection the surgeon should regard them as medical aids to radical excision of the affected tissue. The hope expressed early in the war that drugs like the sulphonamides would allow of more conservative surgery has not yet been realized.

### THE MECHANISM OF INFLAMMATION

Many readers will already be familiar with the work of Menkin of Harvard, who has been engaged for the past fifteen years in re-studying the process of inflammation *ab initio*. The phenomena of inflammation have been well recognized and described in much the same terms since the days of Cohnheim and Metchnikoff. Menkin was ill content with a mere description of what happens, and has sought reasons for it. In claiming to have found these he has introduced four new concepts, two of which take concrete form in substances liberated in areas of inflammation and having specific effects. These are leukotaxine, a polypeptide which has been isolated in crystalline form from inflammatory exudates, and is responsible for increased capillary permeability and a chemotactic effect on leucocytes, and the leucocytosis-promoting factor, a pseudoglobulin which acts on the bone marrow. His other new concepts are the effects of pH in regulating cytology, and the fibrin barrier, which walls off the affected area and constitutes "the primary and basic mechanism of fixation" or localization of the process. It is implicit in Menkin's general hypothesis that inflammation is essentially the same, however produced. He writes of a "basic pattern of injury" and a "fundamentally stereopatterned reaction" caused not only by any kind of microbic invasion but even by physical and chemical agencies. He has in fact freely used heat and turpentine to produce the exudates with which some of these studies were made.

To all this Menkin<sup>1</sup> now adds another mechanism, which he claims to have demonstrated, in the form of a third specific substance which is responsible for local injury and for fever and other more distant effects. This injury factor, which he calls "necrosin," is contained in the euglobulin fraction of inflammatory exudates, from which it can be extracted by prolonged dialysis. This substance, obtained from the effusion in a dog's pleural cavity caused by an injection of turpentine, produces oedema, hyperæmia, and even some necrosis when injected into the skin of a rabbit, and the retention of trypan blue in the affected area shows that the lymphatic blockade characteristic of an inflammatory reaction has been set up. The dog pleural

exudate itself has the same effect, showing that the substance is not formed artificially by chemical manipulation, and the pseudoglobulin and albumin of the exudate have no such effect, nor has the euglobulin of normal dog serum. Necrosin has also been obtained from human exudates of unspecified nature, but was not demonstrated in ascitic fluid from a case of cirrhosis of the liver. That the reaction in the rabbit is not merely a foreign-protein effect is shown by the inactivity of dog proteins other than exudate euglobulin, and by the fact that this will cause similar changes in the skin of the dog itself, though these are described as "perhaps not quite as intense." Necrosin can also be extracted from the blood serum of a dog a day after inducing a pleural effusion with turpentine. That it is in fact absorbed from inflamed areas and exerts distant effects is shown by the consequences of injecting it intravenously in normal animals. These are sharp fever, and a leucopenia succeeded by a leucocytosis. Degenerative changes were also found in the liver and kidneys with leucocytic infiltration, and some of the animals died. An attempt is made to relate these effects to that theory of the causation of shock which attributes it to a toxic substance liberated at the site of injury, but, as the author himself points out, the fact that necrosin does not lower the blood pressure is difficult to reconcile with this idea.

Many pathologists will feel that they would prefer to repeat these experiments themselves before being called upon to comment on the very important conclusions to which they have led. What is involved here is a proffered explanation not only of local damage in inflamed areas but of fever itself and presumably of the degenerative visceral changes seen in acute infections. Purely speculative criticism can be offered only in a tentative way, but there are difficulties which present themselves at once. Menkin himself acknowledges that during dialysis changes may occur in serum proteins, a fact demonstrated by Chick thirty years ago, and, in spite of an experiment which appears to prove the contrary, some suspicion remains that the process of extraction of necrosin may have produced something which was not in the original material. Another difficulty is this: one can accept as reasonable the idea that the body proteins should furnish substances causing increased capillary permeability, chemotaxis, and stimulation of the bone marrow, since these are necessary and beneficent reactions, but why should the body itself manufacture the substance which does all the damage, both local and general? In other words, leukotaxine and the leucocytosis-promoting factor are teleologically credible, but necrosin is not. Finally—and here we are on more factual ground—where in this hypothesis is there a place for bacterial toxins? If we are to regard all inflammation as essentially the same, the suggestion that local damage, fever, and visceral degenerations are due to a euglobulin formed at the site of infection must presumably apply to pneumonia, typhoid fever, diphtheria, and a score of other acute infections. To take only one example, the local damage in diphtheria, which is a necrosis converting the normal mucosa into the diphtheritic membrane, is unquestionably due to diphtheria toxin, as are the viscera and nervous changes in this disease. Although the pre

<sup>1</sup> Arch. Path., 1943, 38, 269.



dominating part played here by a single toxin is paralleled in few other infections, other bacteria produce a variety of toxins with demonstrable local and general effects. It is to these that the phenomena of microbic inflammation have hitherto been attributed, and the temptation to disregard them in favour of a euglobulin is quite frankly not very strong. That such a substance may be formed and have important effects when normal tissues receive gross physical or chemical insults can more readily be believed, but to distinguish thus between different types of inflammation is to abandon Menkin's cherished hypothesis of its unity.

### SULPHONAMIDE PROPHYLAXIS OF GONORRHOEA

Some time after it had been demonstrated that sulphonamide preparations could cure gonorrhoea it occurred to various workers that these drugs might also be of value in the prophylaxis of the disease, much in the same way as arsenical derivatives or bismuth compounds have been used for the prophylaxis of syphilis. Burke,<sup>1</sup> for instance, recommended acetarsol 0.75 g. daily for three days, while others have shown that prostitutes may be prevented from developing syphilis if a depot of bismuth is maintained in their tissues by means of repeated intramuscular injections of a bismuth compound. These methods represent a systemic in contrast to a local method of prophylaxis; and the same applies to sulphonamide compounds administered by mouth. As prophylactics these may be given *before* exposure, in which case the drug is circulating in the blood stream by the time the gonococci first reach the tissues; or *after* exposure but before signs and symptoms have had time to develop: the latter really represents early treatment, since it is assumed that the germs have already been implanted in the tissues. Joses, and Kline and Ryan<sup>2</sup> have recorded their observations on 1,800 naval ratings in an Asiatic station: in a period of some months only two cases of gonorrhoea developed in men taking the full prescribed doses of sulphathiazole. Joses's method was to administer on the day after exposure 3 g. of sulphathiazole at 8 a.m., 2 g. at noon, and 1 g. at 6 p.m. Kline and Ryan gave 2 g. of sulphathiazole on the morning after exposure, and 2 g. about five hours later. Loveless and Denton<sup>3</sup> used sulphathiazole prophylaxis on a test group of 1,400 negro soldiers with 4,000 others as controls. Their method was to give 2 g. on leaving barracks (i.e., before possible exposure), 2 g. on return, and 2 g. next morning. Admission rates for gonorrhoea fell from 171 to 8 over a period of seven months. Arthur and Dermon<sup>4</sup> gave sulphathiazole to 152 men who had had 199 exposures, and compared these with 259 controls who had had 384 exposures: the latter had 15 infections with clinical gonorrhoea as compared with none in the former. The dosage was 3 g. after breakfast on the day after exposure, 2 g. after dinner, and 1 g. after supper.

There is thus evidence that sulphonamide compounds can prevent the development of gonorrhoea if given in adequate doses and at the right time. On the other hand, as shown by Reynolds, Evans, and Walsh<sup>5</sup> and Reynolds and Shaffer,<sup>6</sup> there is evidence that susceptible individuals may, under the influence of sulphonamide drugs, show deterioration in mental efficiency and hand-and-eye co-ordination. It would therefore seem that there is some risk in giving these drugs for prophylactic purposes,

especially to those whose duties require a high degree of mental and visual efficiency such as airmen, engine drivers, drivers of public service vehicles, etc. Not only this; but cases of serious intolerance have been reported after relatively very small total doses of these drugs, and it is open to question whether such risks should be taken when other methods of prophylaxis are available. Other factors have to be taken into consideration. Are these drugs to be given to those who may possibly take a risk, to those who will probably do so, or only to those who have done so? Even the last would involve a very large expenditure of an expensive drug, while supplies sufficient for all three would be colossal. On the face of it few would recommend routine sulphathiazole prophylaxis *before* a possible exposure; and it is doubtful whether it could be done on any scale in any but very exceptional circumstances when other more generally accepted forms are highly effective if applied in time *after* exposure. Then again, what is going to be the effect if large numbers of persons are more or less regularly dosed with sulphonamides? The regularly promiscuous person might be under *almost continuous sulphonamide medication over considerable periods of time*. How would such a man react if he contracted gonorrhoea, and what would be the risk of creating sulphonamide-resistant strains? All these factors would have to be taken into account before recommending the general prophylactic use of sulphonamides in gonorrhoea. At present it seems that such use should be limited to certain special circumstances. Incidentally, there does seem to be one way out of the difficulty—namely, to use micro-crystalline sulphathiazole locally as a urethral instillation after exposure to infection, and this is said to have been effective.<sup>7</sup> The difficulties in the prophylaxis of gonorrhoea are not so much in the methods to be employed as in getting the exposed person to carry them out thoroughly and conscientiously.

### ESTIMATION OF POPULATION

The probable size of the population of the future has been a subject of interest and speculation from two opposite points of view. The seventeenth century school of political arithmeticians believed that the population would continue to grow and that the country and eventually the world would be overpopulated. At the close of the seventeenth century Gregory King, forecasting the future population of England, predicted that it would be 22 millions by the year 3500 should "the world last so long." His estimate for the year 2000 was 8,280,000, or less than the present-day population of Greater London. These forecasts were based on very scanty data: the actual population of the country in King's time was unknown. Until recent years the general principle of an increasing population was accepted. The estimation of the numbers that could be supported varied with the developments in agriculture, transport, and industry. But to-day we speculate about the possible rate of decrease and the size and date of the maximum population. The slow decline in the birth rate, which began during 1870-80, was compensated for by a decreased mortality during the first years: but the probability of a declining population became almost a certainty with the accelerated fall of the birth rate during the first decades of the present century. Recent publicity given to various demographic prophecies has stirred the still pool of public opinion. "More babies" has become the watchword. It is impossible to forecast the size of the population accurately even only ten years ahead, but a general idea of the future may be obtained by considering various hypotheses.

<sup>1</sup> J. Amer. med. Ass., 1943, 141, 827.  
<sup>2</sup> Amer. J. Syph., 1943, 27, 261.  
<sup>3</sup> Ibid., p. 2.  
<sup>4</sup> Ibid., p. 563.

<sup>7</sup> Stedman, H. E., U.S. med. Bull., 1943, 41, 1115.



Glass<sup>1</sup> has collected recent estimates of the future populations of Great Britain and several other countries. All the predictions for Great Britain have been published since 1934. The eight forecasts for England and Wales, by four authors, varied much. The maximum population ranged from 40,214,000 to 43,820,000, and the year of the maximum was placed as early as 1936 and as late as 1960. The actual population has already exceeded four of the predicted maxima. The three forecasts for Scotland dated the decline of the population between 1941 and 1970, with a maximum between 4,970,000 and 5,361,000. Five estimates of the population trend of Great Britain are given: three of these are by the Registrar-General and two by private authors. The latter dated the maximum at 1936 and 1941, and their maxima have already been exceeded by one million. By the Registrar-General's estimates the maximum population will occur between 1941 and 1961 and will be between 47 and 48 millions. The chief reason why some of the forecasts have already proved to be too small is that the birth rate failed to decline in the immediate pre-war years at its previous rate. In fact there was a tendency for the birth rate to rise very slightly between 1935 and 1939. The effect of the war on population growth is at present unknown, but in Europe it has beyond doubt caused a considerable change. At home the first years of war saw a rise in the birth rate and a lowering of the average at marriage. These factors tend to postpone a decline in the population.

### DRUG CONTROL IN LIBERATED EUROPE

The probability that illicit traffic in narcotic drugs may find a fruitful soil in the liberated, dislocated, and poor countries of Europe has been exercising the minds of the Permanent Central Opium Board, which has concluded in London its forty-third session. The possible growth of the evil in certain Balkan countries is regarded with concern. The poppy is legitimately cultivated in these regions for its edible seeds, which are used in food manufacture, but the stalk of the plant during the last ten years has been increasingly used for the extraction of morphine. It is feared that in the countries at present occupied—especially those in which the Germans have destroyed the civil service—the control over exports, imports, and manufacture may have broken down, and that the Allied Armies, on entering, may be faced with an extremely difficult task in coping with the drug situation among the suffering peoples. The Board therefore resolved to give as explicit advice as possible on the subject.

At the close of the Board's session Sir Atul Chatterjee, the president, in an account of its proceedings given to members of the Press, said that British, Dutch, Chinese, and Indian representatives had attended, and the conclusions had received the support of the American representative, who had been unable to attend. He pointed out that the Board itself has no power, nor is it equipped, to exercise control directly in any country or area. Its supervision can be exercised only by the examination of statistics and returns sent to it by national controls. It is only the occupying Powers which in the first instance will be in a position to ensure the proper control of dangerous—that is, narcotic—drugs, and so prevent an epidemic of addiction such as occurred immediately after the last war.

Certain general suggestions have therefore been formulated by the Board in the hope that they may be of use to the authorities in establishing control in the areas for the administration of which they are responsible. For the present the Board has confined itself to the period of military control; further stages will be those in which the

national administration with Allied occupation and supervision is re-established, and the initial period of full national control. The Board suggests that on the liberation of an occupied country, in whole or in part, there should be set up, concurrently with the taking over of the civil administration, an authority designated for the purpose by the occupying Forces. This authority would require all stocks of drugs in civilian hands to be notified to it and placed under its control; it would also control all drugs brought into the country for civilian use, and issue licences for the distribution of such drugs through approved relief organizations, wholesale firms, and recognized pharmacies; it would exercise control over factories for the manufacture of drugs and the establishment of any new factory, and would also have under its strict supervision the import or export of drugs or raw materials. It is proposed that the supply of narcotic drugs for civilian use should be solely on the prescription of a qualified medical practitioner, this requirement to be enforced by inspection, by periodical returns of all transactions and supplies by relief organizations and wholesale firms, and by a system of checking of stocks by qualified officials.

Perhaps it should be added that the jurisdiction of the Board extends much further than that of the League of Nations. It is not an organ of the League, and it has the adhesion of countries like the United States, which never was a League member, and of Soviet Russia, which ceased to be. It was set up by the international conventions of 1925 and 1931, which have been ratified probably by more countries than any other international convention except those relating to the Red Cross and the postal service, and, so far as is known, the conventions have not been denounced by any Government in spite of the war.

### BIRMINGHAM UNITED HOSPITAL

The annual report of Birmingham United Hospital expresses with more than usual appreciation the indebtedness of the board to the visiting medical and surgical staff. With their number still further cut down, with only an attenuated resident medical service at their disposal, with obligations to other hospitals as well as to the Ministry of Health, together with the demands of their consultant practices, they have worked under continual pressure, and yet have maintained the services at the hospitals—the General Hospital in the city and the new Queen Elizabeth Hospital at Edgbaston—in a way to evoke admiration. Tribute is likewise paid to the nursing staff. In some comments on the White Paper the report states that it may be assumed from that document that, especially in the case of the larger voluntary hospitals, the whole of the services of such hospitals will not necessarily be requisitioned for the national scheme and that there will remain scope for "private" service. In that event it can fairly be argued that the proposed Government grant per bed, plus the payment towards the cost of treatment and maintenance of patients under the national scheme, should at least reimburse the hospitals fully for this particular part of their service. The number of in-patients treated during 1943 at the Queen Elizabeth Hospital—12,136—is the highest for any year since the hospital was opened in 1938.

At the meeting of the Medical Society of London held on May 8 the Annual Oration on "A Clinical View of Shock" was delivered by Mr. S. Zachary Cope. At the same meeting Mr. W. Sampson Handley was admitted an honorary fellow. The second of his two Lettsomian Lectures on "The Mechanism of Visceral Pain" will be delivered by Prof. Henry Cohen on Wednesday, May 24, at 5 p.m.

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## PLANNING FOR BASIC RESEARCH IN OPHTHALMOLOGY

BY

C. G. KAY SHARP, M.D.

There is a distinction between planning for research and planning of research. The former is largely carried out by the Government, local authorities, philanthropists, and other public-spirited members of society, be they professional or lay members. The latter is mainly the affair of university administrators and researchers.

There is nothing new in planning for research. The Privy Council planned for research when it appointed the Medical Research Council and when Parliament voted funds for that purpose. That this legislative foresight has been amply justified by results and by progress is beyond doubt. The nation has an enormous burden of, sickness and mental and physical disability, and the Medical Research Council has the stupendous task of attempting to reduce this burden. It is highly improbable that sufficient funds have so far been available to perform this task on a scale commensurate with the enormity of the burden, but much has been done, and successfully done. To say that all aspects of physical disability have been satisfactorily covered by the work to date, supervised by the Medical Research Council, would be to invite criticism. In particular, the great burden of blindness and ophthalmic morbidity, with its financial, commercial, and humanitarian implications, has during the last generation received less generous attention than its importance merits. Surgical technique has been improved, ophthalmology has benefited by drugs and other remedies which are the result of much research outside ophthalmology, but the same great causes of blindness are with us to-day as they have always been, and insufficient organized effort, under optimum conditions, has been made to prevent these causes or remedy their effects.

Local authorities in England are charged with the financial burden of the care of the blind, and they have discharged that duty magnificently. They are consequently interested in prevention of blindness. They have for some years considered alternative methods, designed to secure the maximum success in its prevention. This subject has been viewed from many angles, and I have been successful in directing the attention of these administrative bodies towards research in ophthalmology, carried out under optimum conditions, as being the basis on which all efforts in preventing blindness should be built.

### Team-work and Planning

Research in ophthalmology indicates team-work. It is by no means confined to the activities of ophthalmologists, and it is highly probable that the basic sciences—physiology, biochemistry, and biophysics—will play a part in the prevention of blindness greater in importance than applied ophthalmology; and much research work which is carried out in subjects not directly related to ophthalmology will quite possibly have an important bearing on the causes of blindness—e.g., W. T. Astbury's work on textile fibres (University of Leeds).

From these considerations two needs will be evident: that money must be provided, and that research in ophthalmology must be carried out in close association with the basic sciences, other research units, and clinical facilities.

Local authorities have decided that they are willing to provide the necessary funds for development in research in ophthalmology, carried out under the best possible conditions. It is here that planning is essential. A minimum amount which should be voted for the provision of this research must be estimated. The contribution of each local authority must be assessed on a basis of population. Frequent requests to local authorities for small amounts must be avoided. Many other considerations need to be made, all of which require careful planning.

Dr. F. M. R. Walshe has stated in reference to research personnel: "No planning can provide us with these men or determine the goal of their labours"; and again, "It is round the man and not round the plan that the wheels of research revolve most rapidly." These views have the concurrence of

Sir John Parsons, the Galen of ophthalmological research. The principles involved have already been adopted in the two recently established Ophthalmological Research Centres—(1) in the University of Oxford (Ida Mann); (2) at the Royal College of Surgeons and Royal Eye Hospital (Arnold Sorsby)—except that in the case of Oxford the wheels of research are revolving round the woman.

There is little doubt that a similar course would be pursued by the universities which are at present preparing their schemes if equally acknowledged researchers should become evident. If there are no candidates of the required standard of merit available or likely to be available, how much this unfortunate state of affairs is due to the lack of financial planning in the past is possibly debatable, but it is interesting to speculate how many probably distinguished researchers have been lost to research on account of the more attractive rewards in other branches of the practice of medicine.

To state that none of our most eminent surgeons or physicians, had they devoted their lives to fundamental research, would not have reached equal eminence, would indeed be rash. It would seem, therefore, that an attempt to find suitable leaders of research of proved ability should be made, and, if unsuccessful, then appropriate financial arrangements should be planned (as they have already been planned, as a minimum, in regard to five centres), providing for the recruitment and training of workers.

The rewards of research, as the most valuable branch of medicine, should be assured and ample, and efforts should be made to direct the attention of suitable junior graduates to that vastly interesting and fascinating vocation. That all selected trainees would become ideal researchers is improbable, and for this reason—if for no other, so far as medical graduates are concerned—clinical work should be combined with research work.

One has only to read the biography of Sauter in order to realize that, although a man's ambitions and interests may at one period of his life be concentrated on a certain type of occupation, his interests may be diverted and be productive in an entirely different pursuit. Sauter's greatest ambition was to become an engineer; he was apprenticed to a chemist much against his will, and it was due to the ingenuity of his principal, who deliberately and secretly broke his chemical apparatus in order that the engineering ability of his apprentice could be exercised, that the apprentice's attention was eventually diverted to chemistry. Gradually Sauter found chemistry to be of greater interest than engineering, and eventually gave to the world—morphine.

### Choice of Research Workers

An unfortunate idea seems to have developed that ophthalmological research should normally be the sphere of action of an ophthalmic surgeon. While a certain knowledge of applied ophthalmology is useful, there is ample reason to believe that it is to the university laboratories rather than to the out-patient room to which we must look for any real addition to our basic knowledge of the causes of blindness. The provision of a larger number of selected junior researchers specially concerned with the biophysics, biochemistry, and physiology of the eyes seems to be indicated as the most promising approach to prevention of blindness, and it is now certain that financial assistance will be forthcoming in support of this. By this method the choice of the man or woman around whom the "wheels of research will revolve" will be much wider, and he or she will have had the advantage of appropriate basic training—so necessary in modern research. When one considers the haphazard methods, empirical in the extreme, by which researchers in bygone days carried out their investigations, it is amazing that anything was ever discovered.

There was no planning for research in the days of Antonj Leeuwenhoek. His university was the draper's shop. He was despised by the punctis of his day because he could not write his observations in Latin. One cannot imagine the present-day scientist getting his training for experiment among bolts of gingham, listening to the tinkle of the bell of the cash drawer, and being polite to an eternal succession of Dutch housewives; but that was Leeuwenhoek's apprenticeship, and

later he had his own draper's shop. By day he sold gewgaws; by night he melted the metallic ore to make his rudimentary microscope and ground his wonderful lenses by which he could see things never dreamt of by his forebears. We have advanced a little since Leeuwenhoek's days, but even now the descendants of Leeuwenhoek's critics exist. Encouragement, organization, and financial provision are slowly but surely taking the place of professional jealousy and *laissez-faire*.

The recent decision by the County Councils Association and the Association of Municipal Corporations to provide a minimum sum of approximately £20,000 per annum for ophthalmological research, with a definite bias towards prevention of blindness, is an epoch-making measure in ophthalmology, and furnishes universities and Royal Colleges with sufficient immediate financial assistance for considerable reorganization of research personnel, trained and to be trained.

It may be possible to secure the release from the Services of any outstanding researchers with the necessary experience if they are not employed on war work of vital importance; the flow of suitable candidates for junior posts and for training may be slow until the end of the war, but in the interim the decision of the Local Authorities Associations will enable selected centres to begin work on ophthalmological research and to draft and plan for extension as personnel becomes available.

## THE PUBLIC HEALTH SERVICES

### ADDRESS BY MINISTER OF HEALTH

The Minister of Health was the principal guest at the annual luncheon of the Society of Medical Officers of Health. In proposing the toast to the Minister, Dr. R. H. JOLLY, president of the society, said that members of the public health service as a rule did not air their grievances or their anxieties in the medical or lay press, but some of them, particularly those in maternity and child welfare work and school medical work, were wondering what place would be found in the new health service for the preventive and educational structure which had been so well built up by them during the last twenty-five years. They were conscious of a vague shape ahead—not, indeed, a black cloud, but a White Paper.

Mr. WILLINK began by paying a tribute to the public health services, the general result of whose work was greatly to the credit of those engaged in it. He said that the provisional rates showed a fall in maternal mortality from 2.47 per 1,000 births in 1942 to 2.29 in 1943. The crude rate of infant mortality had fallen from 49 to 48, and the final corrected figure for 1943 was likely, for the first time in the records, to be below 50. In the first quarter of 1941 the number of deaths from diphtheria was 841; it fell in the corresponding quarters of 1942 and 1943 to 627 and 498 respectively, and for the first quarter of this year to 285. It was evident that these figures were closely related to the campaign for diphtheria immunization, the fall having chiefly occurred in the age group 1-15. On the other hand the provisional crude death rate from respiratory tuberculosis in 1943 was higher than in 1942, being 557 per million of the population as compared with 506, an increase related no doubt to the influenza epidemic, which reached its peak in December, 1943. But in 1918, the corresponding year of the last war, the figure was 1,322. The incidence of venereal diseases had also increased, although it was not so high as in the last war.

### The Government's Proposals

Turning to the Government's proposals for a National Health Service, the Minister said that he had invited discussion and criticism, and the invitation had been accepted. These proposals were not going to be put into legislative form in a hurry, and the Society of Medical Officers of Health was exactly the sort of body from which he hoped to receive constructive criticism. He had heard comments made that in this field, as in that of nursing, the references to the public health services were meagre. But he felt that he could point to first-class evidence of the importance attached by the Ministry to the work for which M.O.s.H. were responsible. It was a great

satisfaction to him to have obtained the services as additional Deputy Chief Medical Officer of Dr. J. A. Charles, M.O.H. for Newcastle. He hoped it would be possible, notwithstanding Dr. Charles's acceptance of that appointment, for him to maintain his close connexion with the society. Here also Mr. Willink congratulated the president-elect of the society (Prof. R. M. F. Picken), who was a member of his Medical Advisory Committee.

"Taking the general nature of the proposals," Mr. Willink continued, "I cannot help thinking that many of the proposals which the society itself has made are to be found in the White Paper—universality of service, treatment available without charge at the time of treatment, larger areas especially for hospital services, full use of voluntary hospitals within the service, establishment of Health Centres, closer contact between preventive and curative medicine, central and local professional consultative bodies, and a new outlook and emphasis on social medicine. All these matters are common to your proposals and those of the Government. The differences are really in method and not in principle and intention."

### Three Main Differences

There were three main differences between the society's proposals and those of the White Paper. The society had suggested one central department to absorb all governmental health functions and to be concerned with health and nothing but health. That issue was faced in the White Paper, but it was felt that there were Government Departments which needed medical advice if they were to fulfil their functions, although health was not their main function. Any peril of cleavage could more appropriately be met by close liaison and community of staff. Then the society had suggested—as the National Association of Local Government Officers had also done—that a one-purpose authority should be created in each area, not a Joint Authority as the Government proposed. This question had been dealt with in the third appendix of the White Paper.

"The society will realize that their proposals mean a complete recasting of our whole local government system. That would be a large and prolonged undertaking, and we do not feel that the new health service can await the end of so long a process. But I should like to say that the Joint Authorities which we contemplate will require, in view of the functions we suggest for them, a medical staff of the highest status, with work to do which I imagine will be of immense interest and responsibility. We feel that the planning of the health services in these areas in consultation with the constituent local authorities and with professional and with voluntary hospital experts will be a business calling for high gifts, and that we shall get very great assistance from members of your society."

The third and most controversial of the proposals was that a whole-time salaried service should be instituted for all branches of medical practice. "Of all subjects that is the one on which I should be least wise to embark on this occasion. It is sufficient to say that I feel pretty sure that you realize that you are making a proposal of very wide scope!"

Mr. Willink said that he appreciated the natural anxiety which some of them must feel as to the future of the service. If it was felt that there was likely to be any loss of efficiency, let the Ministry be told and consulted. As against this, he knew they would set on the other side the new statutory duty of securing a full hospital and consultant service, the new responsibilities in relation to home nursing and to Health Centres, possibly also in relation to dental and ophthalmic services. In all these ways there must be immense additions to the scale and importance of the work of medical officers of health.

In a number of fields he got the impression that medical officers—and general practitioners also—under present arrangements had more purely administrative work than was desirable. That was something to be watched in the new arrangements. The importance of educating the public in health matters was something to which he hoped they would pay attention. He had learned a great deal of the work of the Central Council for Health Education, he had seen something of the work of health visitors.

"In all these fields and in the field of what is to-day described as social medicine and positive health you have a great and increasing part to play. I hope that you will deal with all these matters, provided for only in outline in the White Paper. We have in mind to a very full extent, in spite of the brevity of the reference to medical officers of health in the White Paper, the contribution which they are going to make."

## Correspondence

### Aerial Convection from Smallpox Hospitals

SIR.—The article by Dr. Killick Millard (May 6, p. 628) is a useful reminder of a problem which has not yet been solved. More recent events than those he recounts cause one to suspect that smallpox may possibly be transmitted at long range through the air. The question was dealt with by Sir A. S. M. Macgregor in connexion with the 1920-1 epidemic in Glasgow,<sup>1</sup> with the conclusion that, while there was some ground for suspicion that a hospital had disseminated smallpox in its vicinity, the evidence was not definitive. According to my recollection (admittedly not too reliable after twenty-four years), when cases began to be admitted to a different hospital the disease began to occur in its vicinity, but here again it was impossible at a late stage of the epidemic to exclude other possible sources. More definitely, and in this case I can speak from personal knowledge, a confluent case was admitted to the smallpox compound of a hospital from a distant part of the city at a time when no other cases were occurring, and this was the only case of smallpox in that hospital. Death occurred within a day or two. After the lapse of the usual incubation period, patients in a scarlet-fever ward, who had been there too long to have been infected with smallpox before admission, sickened of the disease. The wards in question were among those overlooking the smallpox compound. Of course, it was not possible to exclude carriage by members of the medical staff, who were naturally keen to see this then unusual disease, but they were accustomed to take reasonable precautions, and the juxtaposition of the wards in question seemed to be significant.

Much more striking were the events at Gravesend in 1938, when disembarkation of a case of smallpox of foreign origin was followed by six non-contact cases, four of whom lived at distances ranging from a quarter of a mile to one and three-quarters of a mile from a hospital containing at least one case in the acute stage.<sup>2,3</sup> Apparently no other source of infection was traced in these instances, but other circumstances of this little outbreak indicate that the infection may have been of an unusually dispersive type.—I am, etc.,

Welsh National School of Medicine, Cardiff.

RALPH M. F. PICKEN.

#### REFERENCES

- 1 Annual Report of the Medical Officer of Health, Glasgow, 1920
- 2 *Lancet*, 1939, i, 813.
- 3 *Ibid.*, p. 1125.
- 4 Annual Report, Ministry of Health, 1938-9, 25.
- 5 *St. Bart's Hosp. J.*, 1938, 45, 155.

SIR.—Dr. Killick Millard believes that the case for aerial convection of the virus of smallpox is "very strong"; but he cannot have it both ways. If the virus may be aërially transmitted in effective dosage over distances of the order of half a mile, how can he—a staunch opponent, moreover, of compulsory vaccination—seriously suggest the reception of patients suffering from variola major by "general isolation hospitals" in which the approved distance between ward blocks is 40 feet?—I am, etc.,

E. H. R. HARRIES.

London, N.15.

SIR.—An incident that happened at Salonika in 1917 bears out the air-convection theory so well described by Dr. Killick Millard (May 6, p. 628). A seaman was admitted to a general hospital in the town of Salonika and was subsequently diagnosed as smallpox. He was isolated in a tented camp half a mile from any habitation except the tents of the isolation hospital to which his camp was attached. Yet there was an outbreak of smallpox among the personnel of an ordnance depot which was just half a mile away across a sandy desert. Over twenty cases (British and Greek) were admitted, and there were several deaths among the unprotected. There were no cases in the general hospital where the original case had been admitted.—I am, etc.,

P. G. EASTON.  
Lieut.-Col., R.A.M.C. (ret.).

Sutton Green, nr. Guildford.

### Penicillin for Skin Diseases

SIR.—We have studied carefully and with considerable interest the report on the therapeutic properties of penicillin, with special reference to the section on the treatment of skin diseases (Roxburgh, Christie, and Roxburgh, *B.M.J.*, April 15, p. 524). We note that certain cases were treated with an aqueous solution of penicillin (1,000 units per c.c.m.) used as a spray. This method of application was adopted by us at the end of January, 1944. It was tried out extensively in the skin department of a large military hospital, and satisfactory results were obtained using a strength of only 200 units per c.c.m. So far as we have ascertained, the spray technique had not previously been used.

We have been experimenting with various applications of penicillin for the treatment of certain skin diseases since September, 1943, and in our opinion the spray technique has given the best results, and in the strength used we have found it the most economical preparation of penicillin. A full report will shortly be published.

We would be interested to hear whether the cases which appeared to be irritated by the penicillin ointment or spray were growing penicillin-insensitive organisms at the time penicillin treatment was stopped. Our own observations suggest that in these cases penicillin-insensitive organisms have appeared, and have been the cause of the condition getting worse. The purity of the petroleum jelly used in the base might also be a factor in the causation of irritation. In the first series of cases treated by us, one particular batch of petroleum jelly caused definite eczematization.—We are, etc.,

P. H. TAYLOR.

K. E. A. HUGHES.

### Status Lymphaticus

SIR.—In reply to Major G. R. Peberdy's inquiry (April 29, p. 600) I can say that in the course of some five years' work in the coroner's districts of South London, East Surrey, and the county borough of Croydon, also in hospital practice as a pathologist in and around the London area since 1929, during which time I have carried out an average of not less than three hundred necropsies a year, I have not seen a single case of status lymphaticus. I personally do not believe in the existence of such an entity. With the volume of sudden deaths that I am called upon to examine I feel sure that had the condition a real existence I should have seen at least one case.—I am, etc.,

London, W.1.

DAVID HALER.

### Nutritional Oedema in a Vegetarian

SIR.—The case of nutritional oedema in a vegetarian reported by Dr. Holmes (May 6, p. 620) is of great interest in view of the reports of the widespread incidence of this condition in occupied Europe. While the findings are highly suggestive that the oedema was produced solely by the hypoproteinaemia, it is not possible from the evidence adduced to exclude the influence of myocardial weakness. It is known that oedema of cardiac origin may occur in the absence of enlargement of the heart. Presumably in this case signs of a general increase of venous blood pressure were absent and the blood circulation rate gave a reading within normal limits; otherwise the effect of improvement in the nutritional state of the myocardium cannot be overlooked. In raising this point I have had in mind that reports indicate that sudden death, presumably of cardiac origin, is a not uncommon means of termination in cases of hunger oedema.—I am, etc.,

Dundee.

D. G. MCINTOSH.

### The Effects of Cold

SIR.—Will you allow me to trespass upon your valuable space to comment upon Mr. Norman Lake's reply (April 22) to Dr. Raymond Greene's letter of April 1. I think it is important to our conception of the pathology of the cryopathies to point out that the lesion is one associated with the tissue as a whole rather than with a collection of cells intertwined with blood vessels. The pathology is thus best considered on a tissue rather than a cellular basis.



Mr. Lake in his reply to our paper on immersion foot (Goldstone and Corbett, Feb. 12) was severely critical of our suggestion for the use of an electric cradle in the early stages. This criticism is clearly justified relative to a state of pure frost-bite. It was just such a plea for a measure of distinction as Mr. Lake cites in the final paragraph of his letter (April 22) that we wished to make. The clinical picture in immersion foot, apart from the oedema, is akin to that of a peripheral neuritis. The pain I am convinced is often well-nigh excruciating. The treatment devised must embrace, so far as possible, efforts to relieve this pain, which lasts for some considerable time. When we rightly consider the condition on a tissue basis rather than a cellular, perhaps Mr. Lake will concede there may be some place, as we suggested, for the judicious use of mild heat in immersion foot as opposed to frost-bite.

I know that others have reported good results from the use of icebags, but we were bound to state as a fact that we relieved the most distressing of our patients' symptoms with mild heat. Posture dealt satisfactorily with the oedema, and it gradually subsided.—I am, etc.,

H. VINCENT CORBETT.

### Expectation of Life in Urinary Tuberculosis not Surgically Treated

SIR,—As a supplement to the late Mr. Hurry Fenwick's interesting memorandum published in your issue of May 6, may I add the following.

Some 35 years ago a young woman consulted me about great frequency of micturition. Cystoscopic examination revealed multiple tuberculous ulcers in the bladder and (by ureteral catheterization) the presence of tuberculosis in both kidneys. She went to Margate for treatment in a sanatorium and subsequently to other sanatoria. Her symptoms gradually diminished and finally disappeared altogether. The urine was from the beginning repeatedly tested on guinea-pigs. The test, positive from the first injection, continued to be positive for several years after all symptoms had disappeared, but eventually became negative and continued so for the several more years over which the testing was continued.

When I last heard of her some 25 years after her first visit to me she was in good health, but her husband developed acute tuberculosis and died of it some 12 years ago. The case shows that even extensive tuberculosis of the urinary tract is not necessarily fatal even if not surgically treated.—I am, etc.,

London W 1

VICTOR BONNEY.

### Chewing-gum or Polypus?

SIR,—I have read with interest Mr. McNeill Love's letter (April 29, p. 600). With 20 years' experience of gastrointestinal radiological examination, I doubt whether any experienced radiologist would be deceived by a patient swallowing chewing gum *provided a thorough examination is carried out*—i.e., screen and film examinations at taking meal and at 1, 2, 4, 6, 24, and 48 hours after taking the meal. Any foreign body must then so frequently change its position, be expelled via the pylorus and pass via the colon, that it is nearly certain to be detected, if it is chewing-gum, by its relative lack of density.

There is a very simple way in which false radiological appearances could be obtained, but, for obvious reasons, I do not mention this; but even then suspicion would arise from careful examination and correlation of the clinical history.

In fairness to recruits genuinely suffering from abdominal trouble, the opposite aspect needs consideration—i.e., the value of these one or two film examinations done without prior preparation at the instance of the Ministry of Labour with negative results. Within the last month I have seen two cases, graded 2 after hospital barium meal examination of curtailed type. Both cases had been examined at different hospitals, and my complete examinations by a coincidence revealed Hirschsprung's disease, which has been confirmed by two different colonic consultants. One case had been labelled "neurosis." I have always maintained, when requested to restrict radiological examinations of any type, that if the examination is not thoroughly carried out it is best entirely

omitted—i.e., in a fracture case, unless thorough, the referring practitioner is better off without radiographic examination, depending on his clinical experience rather than relying on poor films or on single films in one plane.—I am, etc.,

Forest Gate, E.7.

BERNARD LEGGETT.

### Shock Treatment of Mental Disorder

SIR,—Mr. K. W. Monsarrat is perhaps justified in his criticism (April 29, p. 603) of the terms used in the editorial note (April 15, p. 537); nevertheless the question itself, the implied meaning of which is clear, is an ever-present and important one. The problem of the relation of the mind to living tissues still remains, and as Sir Henry Bashford asks, "Are the abnormalities of speech and behaviour in fact due to structural or biochemical defects in the nervous system, including the brain?"

The mind is generally supposed to be a sort of higher attribute of the central nervous system, with the result that Sherrington has said that we have not even a basis for the study of the mind (although as early as 1895 he with Mott made a discovery which, had it been followed up at the time as was intended, might very well have given him this basis).<sup>1</sup>

It seems that a review of the independence (and the interdependence) of the mind and the central nervous system functions is long overdue, and that the value of psychiatry as a "back door" to a scientific physiology of the mind should be reassessed from time to time until a satisfactory physiology of the mind is established.—I am, etc.,

Birmingham.

F. A. PICKWORTH.

### Free Medical Education

SIR,—The report of the Committee on Medical Education of the Royal College of Physicians as published in the Press and the broadcast on its findings by Lord Moran make it clear that the greatest emphasis is placed on free education of the medical student right through his career. Of what follows after, so far as I have observed, the committee has nothing to say, but the inference must be obvious. It would be useless to throw a generation of students on to the employment market without the means to start themselves in practice. If, as seems certain, the buying and selling of practices is to be abolished, it would be an enormous help to those of us who are approaching the age of retirement if some hint were to be dropped as to what our fate is to be. The question of compensation is generally by-passed tactfully when discussion veers in that direction, while the prospect of being able to sell a practice becomes about as secure as one of Hitler's promises. I suggest that it would be good policy to settle this financial question first of all, as until it is disposed of all the other plans and recommendations are no more than wishful thinking.—I am, etc.,

Bridlington.

C. J. GOROON TAYLOR.

### Colonial Medical Service

SIR,—In your issue of May 6 Dr. J. B. Davey referred to a speech made by Dr. Morgan on March 16 in the House of Commons. In the course of this he spoke of the Colonial Medical Service as "one of the worst in the world" and as "a disgrace."

My own concern in the matter is only that of one who has for some years attempted to make an independent study of conditions in our Dependencies. As such, one must be deeply interested to see that the recruitment to a service so vital to the welfare of the Colonial peoples is not prejudiced through the acceptance by professional men in England of an impression that its existing members merit the description which Dr. Morgan has attempted to convey of them.

I am less concerned with the main issue on which he was addressing the House—namely, the merits of a "bureaucratic" medical service. It is not, however, easy to see how medical facilities could be provided in most of our Dependencies other than through a State Medical Service. The private practitioner has begun to establish his position in India; but this has only been made possible by the pioneer work of the Indian Medical Service in introducing European systems

<sup>1</sup> F. W. Mott, *The Degeneration of the Neurone*, 1900, p. 50.

of medicine and surgery in India, and by the high reputation which its members have earned. A similar development is now taking place in Ceylon, and might have been expected to follow from the establishment of the medical schools in Malaya and Hong Kong. It will, we may hope, follow in due course when the teaching institutions now projected for Africa and the West Indies reach their maturity. But in all these cases the State service must for long continue to be the principal agency alike for safeguarding the health of the population and for the local expansion of medical training. Everything, therefore, will depend on the professional work of the members of the Colonial Medical Service and the respect in which it is held.

The service now contains about 700 medical men recruited from the United Kingdom. They have the assistance of about 1,200 medical men locally recruited, and about 600 nurses recruited from the United Kingdom, together with a large body of locally trained nurses. It does not perhaps befit a layman to discuss the professional capacity of this great body of those who are, in much more than a technical sense, public servants. But I am on firm ground in speaking of the almost dramatic change which their efforts have made in the health conditions of some of our Dependencies and the confidence they have inspired in the native peoples to whose needs they minister. Achievements such as those which stand to the credit of the medical services in Malaya—to which more than one foreign observer has paid a tribute—or the success attained in combating epidemic diseases in Africa are not the work of men who merit the slur which Dr. Morgan has cast at them. I hope that this correspondence will afford an opportunity for some qualified authority to speak also of the contributions which members of the service have made to medical research. They are obviously far from negligible.

If the service merits a criticism it is that its numbers are inadequate to deal with the vast problems of health which it has to face. But that is not a matter for which the service itself is responsible, and it is one that will, we hope, be remedied by the growth of the resources of the Dependencies and by the assistance which can now be obtained through the Colonial Welfare and Development Act. I may add that the forthcoming annual report of the Colonial Research Committee should be of interest to medical men in this country, as showing the steps which are contemplated for the strengthening of the service on its research side.

There is no one who would not welcome the assistance which members of Parliament could give in making provision for expanding the strength or improving the organization of the service. If they can do this, it will be of far more value to the Colonial peoples than an attempt to shake their confidence in the competence of the service, or to lower it in the estimation of the medical profession in this country, which must provide the personnel for its expansion.—I am, etc.,

The Athenaeum.

HAILEY.

### Service Medicine

SIR.—As members of another branch of the medical services of the armed Forces may we be allowed to endorse most heartily the sentiments expressed by Air Cdre. Cade and Conybeare, and Squad. Ldr. Hope Lamb in their replies on April 22 and 29 to the anonymous writer of a letter under the above heading in your issue of April 1.

We, too, in pre-war days had considerable knowledge and experience of consultant practice and of hospitals, both teaching and otherwise, and in the last four and a half years have had ample opportunity of comparing them with the organization of the Army Medical Service in various theatres of war. We agree with Cade and Conybeare that the soldier gets better treatment than does the civilian, even in peacetime. Undoubtedly an important factor in the attainment of this result is the fact that the soldier receives no domiciliary treatment except for trivial conditions. When he requires medical attention he must be admitted to an organized medical unit where there are facilities for investigation and treatment under skilled supervision, which could very seldom be made available in an average home.

It is easy to find faults in any big system, and when that system, after a phenomenally rapid expansion, has to cope with medical and surgical problems in every part of the world,

it is surprising that there are not more. In our experience the directorate of the A.M.S. welcomes reasonable criticism, and has accepted many constructive ideas, large and small, from the "civilians in uniform," incorporating them into its highly efficient organization for the increasing betterment of the patient's treatment; he gets the best of two worlds—the experience and organization of an established service together with the expert clinical knowledge and enthusiasm of its "lay" members.

We feel that our R.A.F. colleagues have dealt more than adequately with the specific complaints of the anonymous letter writer. Nevertheless, having had extensive experience of the Army Medical Service both on active service abroad and also at home we strongly deny the allegations of "over-staffing," of "bad staffing," of unnecessary interference with the clinical freedom of the medical officer, and of avoidable lack of equipment or drugs. Taken by and large the utilization of medical officers as supplied from civilian sources shows great discrimination on the part of the administrative authorities, and the meticulous consideration given to individual cases with a view to obtaining the most of their services is as encouraging as it is commendable.

A system must be judged by results; of these the Army Medical Service has reason to be proud, and abundant proof of the high standard of both medical and surgical treatment under most adverse environmental conditions can be seen in comprehensive and authoritative surveys in your own columns, and in those of other medical journals. These results could not have been obtained without good instruments, drugs, and equipment, nor without a high morale among the medical officers.

The Army Medical Service has been faced with an enormous task: it has set itself the highest standard: we feel that it would be most unjust should the biased opinions of one individual lead to anything approaching a general impression that these standards are not being more than adequately maintained.—We are, etc.,

A. E. PORRITT.  
Brigadier.  
E. BULMER.  
Brigadier.

### Medical Certificates for Special Rations

SIR.—On page 598 of the *Journal* for April 29 is a significant and only too tangible shadow of things to come. There is published (without any comment of the B.M.A.) a list of some of the ukases of the Ministry of Food. Among these occurs the outrageous suggestion that, in a certain specified list of diseases (including gout) a special allowance of various foods is available if the doctor in attendance fulfils certain form-filling bureaucratic requirements. It appears desirable to direct special attention to these. To quote the edict: "The certificate must give the clinical and biochemical data on which the diagnosis . . . is based."

Now, Sir, these allowances are to be obtained on the recommendation of the Food Rationing (Special Diets) Advisory Committee, and before they are granted this very detailed certificate is required to be submitted to the local food office. It is hoped that this office will merely act as a forwarding agent: in any case, why, oh why, must the biochemical data and what will inevitably resolve itself into a clinical essay be submitted to the local food bureaucracy? What possible benefit can accrue from the study by lay persons of detailed clinical and biochemical data?

What happens to people unfortunate enough to suffer from a slightly atypical form of any of these specified conditions? Is the victim to be debarred from dietetic treatment because he cannot conform to a textbook description of disease? Are all patients in war, and therefore presumably in peace, to be compelled to suffer only from standardized diseases? What has happened to the principle of professional secrecy? What has come over the profession thus meekly to hand over its prerogatives to, of all things, a local food committee? What has happened to professional pride and honour? If a conscientious doctor has been sufficiently skilful to diagnose any of the given conditions, surely he will wish to treat the case? Can't his word be trusted, and if not, why not? Are we mildly and stupidly going to allow our professional honour and

integrity to be valued at less than the word of a local food committee; or, for that matter, at less than that of a distant advisory council?

For what do we pay our B.M.A. subscriptions? The B.M.A. membership of about 45,000 should give it an adequate income. Are we to get nothing but White Paper questionnaires and the B.M.J. in return for our money? What is the Editor doing to allow this series of edicts and rescripts to pass without any comment or observation on it? Is the Association and its *Journal* to be reduced to a mere transmitting agency for bureaucratic demands?

We have little doubt that there are other instances of these special orders of which some of the profession and certainly the public know nothing. Bureaucracy is like a fungus: it permeates in darkness; let us drag its infiltrations out into the light of publicity. Infiltration is occurring and precedents are being created while we are still nominally a free profession. Excuse like that of the music-hall comedian (don't you know there is a war on?) will be offered. We do know, and it is the oldest war in the world—that of free men against would-be slave-owners.

This, Sir, in our opinion, is merely part of the blue-print for the degradation of the profession and the enslavement of the public—in other words, it is part of the plan to capture and Nazify both. Sir, we, the undersigned, wish most emphatically to record our protest at this unmerited slur on the profession. We wish you to accord this, our considered opinion, the fullest publicity, and thus to direct attention to this widespread and insidious undermining of the essential doctor-patient relationship.—We are, etc.,

H. M. STANLEY TURNER  
(Chairman).

J. O. M. REES.

A. C. DE B. HELME.

DAVID HALER.

Guildford Practitioners' Group.

### Ophthalmic Surgeon and Optician

SIR,—As one who, as a Fellow of the British Optical Association before qualifying in medicine, has had some experience of both sides of the question, may I welcome the concise plan put forward by Mr. J. P. Spencer-Walker in your issue of April 22 under the title "The Ophthalmic Surgeon and the Optician"?

Addressing a group of opticians recently, I gave it as my conviction that the opinion that opticians were incapable of accurate refraction was fast dying a natural death, and it is refreshing to find confirmation in the form of Mr. Walker's proposals, proposals strikingly similar to those which I placed before the meeting referred to above, and with which the optical executives are also conversant.

Mr. Walker's paper was purposely only an outline and it would be unfair to criticize it on matters of detail, but there are points which I can see will only become *faits accomplis* by the most cordial and understanding staff work between ophthalmic and optical representatives. Here are four which occur at once to me: (1) The optical majority are not yet ready to give up the "shop." (2) The powerful dispensing associations would find it hard to turn their members into ophthalmic opticians. (3) The optical societies may not readily sink their identities in a new "Ophthalmic Opticians Council." (4) Not every optician will regard being a medical auxiliary as conferring an "enhanced status."

Two statements by Mr. Walker are vital in considering the whole problem. First, that stressing the necessity for dual examination, by both surgeon and optician, for *everyone*; and, secondly, its corollary "fear is unnecessary for there is work for all."—I am, etc.,

H. F. MELHUISH, D.O.M.S.

Western Ophthalmic Hospital, London, N.W.

SIR,—While we greatly appreciate the spirit which stimulated Mr. J. R. Spencer Walker's article, we must point out that the suggested plan appears to be based on certain errors, which, if uncorrected, might lead to unprofitable discussion. Mr. Spencer Walker says: "The ophthalmic surgeon is concerned to a large extent with the physiological and pathological defects of the eye, and the optician with the appliances used to correct certain of these defects." Even though it is clear

that Mr. Spencer Walker appreciates the capability of the optician to refract, since he says, "The refractive error may be found by either the surgeon or the optician," it is obvious that these statements indicate an insufficient appreciation of the scope and status of ophthalmic optics, which has been defined as: "The field of work concerned with the function and conservation of vision, the correction of anomalies due to anatomical and physiological defects, and the appliances used for these purposes."

While refraction, therefore, must remain the essential function of the optical practitioner, ophthalmic optics is a much wider field of work than refraction only; orthoptics, colour vision, night vision, and visual problems in industry all come within the legitimate sphere of ophthalmic optics. The fact that medicine has concerned itself with certain aspects of ophthalmic optics—e.g., orthoptics (when, it should be noted, it was immediately necessary to create an auxiliary service)—does not invalidate the above conception of ophthalmic optics as a whole.

This, however, is only one indication of the unsuitability of ophthalmic optics being controlled by medicine. Ophthalmic optics has developed as a distinct and individual field of work for very definite reasons. It has developed on distinct and separate lines from quite early times. It is based on the science of physics and is concerned with the adequacy of healthy eyes, thus differing from ophthalmology, which is traditionally occupied with disease. These constitute the essential differences between the two professions in their fundamental outlook and fields of work.

Had it not been for the absurd and illogical antagonism which has prevented a true assessment of the position, medicine must have officially recognized the development in the capabilities of the modern optical practitioner which has been taking place over a long period. As an example of the development of his academic standing it should be noted that the honours diploma of the British Optical Association is accepted by the University of Manchester for admission to a research course for the degree of Master of Science in the Faculty of Technology. Both it and the honours diploma of the Spectacle Makers' Company are also accepted by the University of London for admission to special courses at the Imperial College of Science and Technology, successful completion of which entitles candidates to the Diploma of the Imperial College (D.I.C.). In addition they are approved by the War Office in lieu of a university degree in connexion with enlistment for certain scientific duties which may not be more fully referred to for security reasons. It is safe, therefore, to say that the potential value to the community of the technique of ophthalmic optics has been gravely and grossly underestimated by official medicine.

The second error is related to the first and concerns Mr. Spencer Walker's point regarding the necessity of control. Here there seems to be some confusion. Medical control and State control are two different things and for very different purposes. *State control* is clearly in the interests of the community, the addition of medical control not necessarily so.

Statutory control of the opticians' professional services does exist in regard to one section of the community only, but is denied to all others. The Ophthalmic Benefit Approved Committee of the Ministry of Health, in respect of National Health Insurance patients only, recognizes refraction by the optician and controls the supply of optical appliances. In addition, the opticians' services are officially used in Royal Ordnance factories, where a very satisfactory relationship exists between the doctor and the optician.

That ophthalmic optics is linked with medicine where the detection of pathological conditions is studied is insufficient reason for medical control of the whole of our technique. The optical profession acknowledges with special gratitude the public spirit of those individual ophthalmologists who have helped us to become efficient in this aspect of our work. Proficiency could indeed have been reached more easily if organized medicine had assisted in providing facilities, and Mr. Spencer Walker can be assured of our willing co-operation regarding any sound proposals in this direction. Medical representation on any statutory Controlling Board would, as a result, be welcomed.

It should be noted that the optical profession has never attempted to trespass on what it regards as exclusively medical territory, and we agree emphatically with Mr. Spencer Walker's statement that the optical practitioner can never become absorbed into medicine, since this would necessitate medical registration—as wasteful and unnecessary a basis for optical practice as it would be for dental practice.

It is submitted that the field of public health is now too wide to be covered adequately by a single profession, and that so great is the knowledge needed in this sphere that its successful application has required, and must in the future require, the development of separate and complementary professions within the general fabric of the health service.

Little difficulty will exist in devising a basis for co-operation and collaboration with medicine once a proper relationship has been established, and while we do not claim equal seniority with the

ophthalmologist in any Public Health Services scheme, an auxiliary status is entirely unsuitable to the importance of our technique and the record of our service. Freedom to develop is the life blood of the optical profession as it is to the medical profession, and in the words of Mr. Willink, "A profession needs these things . . . if it is to attract the right people and to keep on achieving the highest results."

As it is impossible for us in the space of this communication to produce all the available evidence in support of the claims made, we would ask Mr. Spencer Walker and those interested in this important matter to examine all the relevant facts presented in a pamphlet, "The Place of the Optical Profession in the Health Services of the Nation" issued by this *ad hoc* committee and obtainable from the address given below. (The committee represents protective bodies and examining bodies recognized by the Ophthalmic Benefit Approved Committee.) We are confident that no considered opinion will then be forthcoming that it is in the interests of the community or ultimately of medicine itself to assume control of the technique of ophthalmic optics.—I am, etc.

W. B. BARKER.

Chairman, Beveridge Report Committee (Optical Profession)

65, Brook Street, London, W.

### First Aid according to St. John's

SIR,—It is indeed refreshing to read Dr. M. E. Lampard's criticism (April 8, p. 505). As both a teacher and examiner I endorse everything he says. The manual, in the hands of a first-aid, is much like a loaded tommy-gun in the hands of a child. As a "refresher" to a junior H.S. it might have its use, but for whom it is intended it is a menace. I have often shuddered at the impish satisfaction of the candidate who has, sometimes successfully, adjusted a tourniquet, and my daily prayer has been that, should I be in need of this application, he may not be at hand at the critical moment.—I am, etc.

Exford.

CLAUDE A. P. TRUMAN.

SIR,—That so much mumbo-jumbo is taught in first aid is due partly to the vanity of its medicine men and partly to the enthusiasm of its expert laymen. First aid needs some Ostlers to cut away its dead wood and fungus. Yet what hope is there when we get such unimaginative and dogmatic arguments as those of Dr. M. M. Scott, who recoils in horror at any honest criticism of his sacrosanct St. John textbook. (Incidentally, about the first-aid treatment of a fractured humerus: an expert young M.O. from North Africa told us Home Guard doctors that there they slung all arm fractures in a broad bandage. Will the Dr. Scotts please note.)

It looks as if Civil Defence, anxious to fill up the long hours of its personnel, has forced the nation into making a cult of first aid and us into being its arch-priests. No reasonable person can deny that the teaching of first aid needs complete overhauling; there is so much bunkum in it.—I am, etc.

London, S.W.4

H. J. POWELL.

### Intelligence and Season of Conception

SIR,—I have just received your number of March 4 in which Surg. Cmdr. J. A. Fraser Roberts states as a fact that children conceived during winter months are on the average more intelligent than children conceived during summer months. I have not yet had a chance to see any subsequent correspondence or of consulting any of the authorities he quotes. Surely one explanation of this fact is that children conceived during winter and born in July-October more closely fit in with the school year, which normally begins in September. Children born during the spring either attend school for the first time 6 months younger than the others or make this first attendance in the middle of the school year and thus miss much of the groundwork. This principle applies not only to young children attending at the age of 5, but also to those who go to public schools at the age of 14.—I am, etc.

W. F. VEALE.

A. B. Loveman and R. P. Morrow (*Amer. J. Syph. ven. Dis.*, 1944, 28, 79), who record 8 cases of intra-urethral chancre, maintain that the condition is not so rare as the literature suggests. Early diagnosis is important. Careful palpation of the urethra for circumscribed induration in all cases of urethritis, unexplained inguinal adenopathies, and all genital lesions should be made. The final diagnosis should be made by discovery of *T. pallidum* from the local discharge or the inguinal lymph nodes.

## Obituary

E. HURRY FENWICK, C.B.E., F.R.C.S.

Mr. Edwin Hurry Fenwick, who died at his home in Bedford Gardens, London, on May 5, was for many years a leading urologist and a general surgeon on the staff of the London Hospital, where he had received his early training. He qualified in 1880, and after taking the F.R.C.S. in 1882 studied methods at clinics in Leipzig, Berlin, and other Continental centres. During his period as surgeon and lecturer on clinical surgery at the London Hospital Hurry Fenwick examined in physiology for the English Conjoint Board; he was also consulting surgeon to the West Herts Infirmary. He served during the last war in the R.A.M.C.(T.), reaching the rank of lieutenant-colonel and receiving the C.B.E. in 1919, mainly in recognition of his work as officer in command of the Military Hospital, Bethnal Green, and of the military section of the London Hospital.

From 1919 to 1925 he held office as president of the International Society of Urology, and he was president of the Urological Section at the 17th International Congress of Medicine. He was also a corresponding member of the French, Russian, German, Italian, Belgian, American, and Spanish Associations of Urology. He wrote much on his specialty, having no fewer than ten books to his credit, published between 1889 and 1911; and only the other day, at the age of 87, he contributed a note to these columns on "Expectation of Life after Nephrectomy for Urinary Tuberculosis." He was one of the earliest English surgeons to take up electric light cystoscopy in the 'eighties, and he had a very large experience of operations for urinary calculus and vesical tumours.

Dr. DAVID ALEXANDER, C.M.G., died in Glasgow on April 2, having been in retirement for some sixteen years. After obtaining the L.R.C.P., L.R.C.S.Ed. and L.R.F.P.S.Glas. in 1896, he filled several appointments before joining the West African Medical Staff in 1903. He obtained the certificate of the London School of Tropical Medicine with distinction in 1904, and his first appointment was to the then Northern Nigeria. In 1905 he obtained the D.T.M. & H.Camb. and in 1910 the D.P.H. of the Irish Colleges. Early in his career he realized the importance of public health, and he was in the first batch of appointments to the new branch of the service—the Sanitary Service. He must be given no small share of the credit in bringing about the improved conditions of living which led to the rapid advance of the West African Colonies. He worked and left a lasting mark in Sierra Leone and in the Gold Coast before returning to Nigeria as Director of Medical and Sanitary Services. A big man, physically and mentally, David Alexander had a wide knowledge of general medicine and of public health, and he also took a warm interest in medical research. He was a born administrator and gained both the affection and the respect of his staff. Modest in regard to his own attainments, he was intensely proud of the C.M.G. awarded to him while serving on the Gold Coast. In Nigeria he did the spade-work which led to the formation of the Medical Training College, and he was the instigator of many other advances. His old colleagues will regret the passing of a valued friend, and many in West Africa will feel the loss of an outstanding figure in the development of their country.—A. C.

The death on April 19 of Dr. NORMAN JAMES McCASKIE removes one of the senior practitioners of the South Kensington district who had spent the whole of his post-hospital career in Onslow Square and the neighbourhood. Himself the son of a medical father, whom he joined in practice early in this century, he was educated at Westminster School, Caius College, and St. George's Hospital, where he won the University Scholarship and held the usual resident appointments with marked credit to himself. He qualified M.R.C.S., L.R.C.P. in 1899, became M.B.Camb. in the following year, and M.D. in 1903. McCaskie was one of those very intelligent, hard-working, highly educated men who did not, in the era before the present impulse to specialization, disdain the life of a general practitioner. He possessed not merely a thorough knowledge of medicine and surgery but the kindness, the tact, and the discretion which attracted a wide circle of grateful patients. Without any affectations, he yet comported himself with dignity, and was the sort of doctor to whom patients came for advice outside their bodily ailments. For many years he had his younger brother, Dr. Harry McCaskie, as his partner; and he had also a

brother-in-law, Dr. Swete Evans, in our profession. Among his own colleagues he was very popular in a wide circle; and it is safe to say that few men of his generation in London adhered consistently to as high a code of professional ethics as did Norman McCaskie. He was visiting apothecary to St. George's Hospital, an honorific title highly valued among the alumni of the medical school there.

Dr. DAVID MITCHELL MACDONALD died at his home at Arncliffe, Westmorland, on May 2 at the age of 74. Originally a pharmacist at Aberdeen, he graduated there M.B., Ch.B. in 1900, proceeding M.D. in 1906. A year later he took the D.P.H. of St. Andrews and in 1914 became F.R.C.P.Ed. He was in successful practice at Dunkeld, Perthshire, and at Alloa, finally in semi-retirement at Arncliffe. He had served as captain, R.A.M.C., with the Scottish Horse in 1914-18, and his work in the present war was in hospitals in the Birmingham area, where he made an independent clinical study of the sulphoamides, especially in children. Author, during 60 years, of *The Student's Pocket Prescriber* he had just completed revising for press the 12th edition, the 19th printing since the first edition in 1882, much of the treatment sections having been rewritten in the light of recent advances. Dr. Macdonald was also responsible for one of Livingstone's Catechism Series, *Materia Medica*, which ran into six editions, these and other publications reflecting his early interest in pharmacy.

#### Correction

Prof. G. Grey Turner writes:

Acting on information, from what I regarded as an unimpeachable source, of the very much regretted demise of my friend F. B. Lund of Boston, and actuated by warm attachment, hastened to pay a tribute which was published in your issue of April 15. It was therefore a joyful surprise to hear of his survival in vigorous health and to have confirmation in a cheerful letter written by his own hand and received two days ago. Very much regret any distress or annoyance which may have been caused to the doctor or his family by my inadvertence. I am sure that your readers will join with me in wishing Fred Lund that continued health and vigour which proves him to be so very much alive! I would further express my very sincere apologies for breaking the long record of accuracy for which the *British Medical Journal* is so well known.

\*\* We wish to join with Prof. Grey Turner in his expression of regret for pain inadvertently caused and of pleasure at knowing that Dr. Lund is in good health.—Ed., B.M.J.

## Universities and Colleges

### UNIVERSITY OF LONDON

The following appointments to the Senate for the period 1944-8 have been made: *Faculty of Medicine*, Sir Francis Fraser, M.D., F.R.C.P. (reappointed). *General Medical Schools*, the Right Hon. Lord Moran, M.D., P.R.C.P. (reappointed).

### UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examination indicated:

THIRD M.B., Ch.B.—PATHOLOGY AND BACTERIOLOGY: Ruth A. Ainsworth, J. J. Burke, Alexander Dowling, Eve G. Field, Harold Jackson, Thomas Jackson, Joan E. Nuttall, Margaret W. Oliver, E. L. Peel, A. H. C. Ratcliffe, Margaret Taie, Marie R. West, W. McC. Whittaker.

### UNIVERSITY OF DUBLIN

The thirteenth John Mallet Purser Lecture will be delivered by Prof. Thomas Walmsley, M.D., of Queen's University, Belfast, in the Physiology Theatre of the School of Physic, Trinity College, on Wednesday, May 24, at 4.30 p.m. Subject: "The Unity of the Organism."

### ROYAL COLLEGE OF SURGEONS OF ENGLAND

At an ordinary meeting of the Council on May 11 with Sir Alfred Webb-Johnson, President, in the chair, Mr. J. B. Hume was re-elected a member of the Court of Examiners for a further period of three years as from June next. Mr. W. H. Collins was invited to accept appointment as a Hunterian Trustee. It was decided not to award the Hallett Prize on this occasion.

Diplomas of Membership were granted jointly with the Royal College of Physicians of London, to the candidates whose names appear in the report of the meeting of the Royal College of Physicians published in the *Journal* of May 6 (p. 638) and to D. M. Montgomery and A. J. S. Perfect.

### ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College held on May 2, with the President, Dr. A. Fergus Hewat, in the chair, Dr. R. E. Verney (Edinburgh) was introduced and took his seat as a Fellow of the College. Drs. T. McLaren Galloway (Carlisle), W. D. Henderson (Woking, Surrey) and H. P. Tait (Edinburgh) were elected Fellows.

## The Services

Surg. Cmdr. D. MacK. Craig, D.S.O., R.N.V.R., has been awarded the R.N.V.R. Officers' Decoration.

Temp. Surg. Lieut. J. H. Fisher, R.N.V.R., has been mentioned in dispatches for outstanding skill, resolution and devotion to duty in successful landings at Anzio.

Capt. V. J. McKenty, R.C.A.M.C., has been awarded the M.C. in recognition of gallant and distinguished services in Italy.

The M.B.E. (Military Division) has been awarded to Capt. (Temp. Major) J. F. A. Forster, I.M.S., in recognition of gallant and distinguished services in the field.

Cpts. G. O. Hughes, and E. H. Jones, R.A.M.C., and Cpts. R. N. Chopra, J. N. Ghosh, and K. K. R. Nadiu, I.A.M.C., have been awarded the M.C. in recognition of gallant and distinguished services in Italy.

### CASUALTIES IN THE MEDICAL SERVICES

Wounded.—War Subs. Cpts. J. H. Brown and J. Greenhaugh, R.A.M.C.

Wounded or injured.—Temp. Surg. Lieut. R. J. Alcock, R.N.V.R. Missing, presumed killed.—Temp. Surg. Lieut. N. A. Douglas, M.B.E., and Temp. Acting Surg. Lieut.-Cmdr. S. L. Lord, R.N.V.R. Wing Cmdr. RICHARD MALHERBE OUTFIN who was killed in a flying accident on April 29 at the age of 36, studied medicine at Guy's Hospital and qualified L.M.S.S.A. in 1935. He was appointed to a commission in the Medical Branch of the Royal Air Force on May 4, 1936, and at the time of his death was senior medical officer at a group headquarters over-seas.

### DEATHS IN THE SERVICES

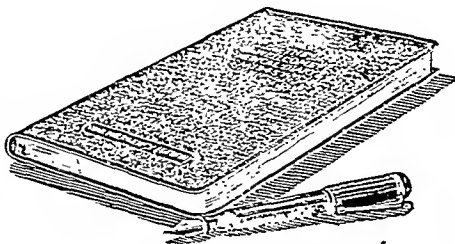
By the death of Col. JAMES CRAWFORD KENNEDY, C.B.E., R.A.M.C. (ret.), on April 4, at Ash, Surrey, at the age of 65 the Service has lost an officer of high scientific attainments. He was educated at Edinburgh University and graduated M.B., Ch.B. in 1900, obtained the M.D. with a gold medal for a thesis on Malta fever in 1908, and took the D.T.M. & H.Camb. in 1909 and the M.R.C.P.Ed. in 1925. He entered the R.A.M.C. in 1900 and rose to the rank of brevet colonel in 1923 and colonel in 1928. The most important of the many posts he held were membership of the Mediterranean Fever Commission, which established the goat's milk theory of infection and led to the practical abolition of this serious disease from the military forces at Malta and from the British Navy; the assistant professorship of pathology and the professorship of medicine at the Royal Army Medical College; consultant physician to the British Forces in Turkey, 1922-3 and to the British Army 1922-9; and A.D.M.S. Poona in 1930-2, on the termination of which appointment he retired. Among the distinctions he gained were his appointment of Hon. Physician to the King, 1923-32, and the award of the C.B.E. (Military Division) in 1923. He served in the war of 1914-18 in India and Mesopotamia and was mentioned in dispatches. After his retirement Col. Kennedy served on the Ship Surgeons Subcommittee of the B.M.A. in 1938-9 and held the post of medical inspector to the P. & O. and associated shipping lines. He wrote a number of papers, chiefly on tropical medicine and bacteriology. His recreations included golf, lawn tennis, and yachting.

Col. LIONEL AUGUSTINE JOSEPH GRAHAM, A.M.S., who died of cerebral thrombosis on March 24 while on active service with the M.E.F., qualified L.M.S.S.A. in 1915 after studying at Cambridge and Guy's Hospital. D. G. E. writes: To his colleagues in the R.A.M.C. "Nap" was well known as an experienced physician and administrator who had specialized in venereology and dermatology. He had served in England, Egypt, Palestine, Syria, India and Malaya, and in the present war he served with the B.E.F. at Army Headquarters in France; on his return from France he went out to the M.E.F., where he was in command of a general hospital. When at Cambridge he won his half-blue at lawn-tennis, and kept up his keen interest in the game throughout his career. He regularly represented the R.A.M.C. at this game, and at Singapore in 1935 he won the open singles in the Services tournament against a Wimbledon player of exactly half his own age. He had a marvellous eye for any ball-game, and could, for instance, place his services with uncanny accuracy, first in one corner and then the other of the service court. He was also very successful at golf and won several competitions at Singapore and in India. The Army Medical Services have lost a most popular and efficient officer and doctor, and the Army a very good all-round sportsman. His brother officers and colleagues will cherish the memory of "Nap" as one of their best friends.

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## ANOREXIA IN CHILDHOOD

Among the many complaints of childhood on which medical advice is sought, anorexia with associated cessation of gain in weight, is probably the most common.

Of the likely causes of this lack of appetite, dietary deficiency, particularly hypovitaminosis B<sub>1</sub>, is, according to many authorities, the most

important. Anorexia associated with gastro-intestinal atony is certainly the earliest and most constant sign of vitamin B<sub>1</sub> deficiency and its presence, by lessening the intake and decreasing the absorption of food, tends to establish a vicious circle in which the tissue content, not only of vitamin B<sub>1</sub>, but of the other essential food factors, is progressively lowered.

### THE EFFECT OF INCREASED VITAMIN B<sub>1</sub>

Controlled clinical trials have shown that the administration of vitamin B<sub>1</sub> is specific in preventing and curing anorexia and associated gastro-intestinal functional disturbances such as atony, constipation and diarrhoea when these are of nutritional origin. Since other factors of the vitamin B complex may be implicated in such syndromes, the whole B complex has been recommended,<sup>1</sup> and it is common practical experience that a course of treatment with Bemax

leads to rapid and striking improvement in the clinical picture.

In deficiency states the lack of more than one food factor is nearly always present, so that, in treatment, a combination of the known vitamins should generally be administered. This is a further sound reason why, in treating anorexia of childhood with the vitamin B complex, Bemax should be employed.

### THE MULTIPLE FACTORS OF BEMAX

Since, even under normal peace-time conditions, it was not a simple matter to construct a diet providing the optimal adult intake of vitamin B<sub>1</sub>, and since the daily vitamin requirements of children are much higher than those of adults, the provision of Bemax to young children offers the best treatment for anorexia and associated sequelæ of hypovitaminosis B.

Bemax provides, at time of manufacture, approximately:

Vitamin A	280 i.u. per oz.	Manganese	4.0 mg. per oz.
Vitamin B <sub>1</sub>	240-420 i.u. " "	Iron	2.7 mg. " "
Vitamin B <sub>2</sub> (riboflavin)	0.3 mg. " "	Copper	0.45 mg. " "
P.P. factor	1.7 mg. " "	Protein	33%
Vitamin B <sub>6</sub>	0.45 mg. " "	Available	
Vitamin E	8 mg. " "	Carbohydrate	39%
		Fibre	2%
		Calorific Value	104 per oz.

<sup>1</sup> J. Amer. Med. Assoc., 1938, 110, 953.

Further particulars concerning Bemax from Vitamins Ltd. (Dept. B.X.U.1), 23, Upper Mall, London, W.6.



### TRADE 'DECICAIN' MARK (The Original Product)

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## Medical Notes in Parliament

### National Water Policy

Opening, on May 3, a debate on water supply, Mr. WILLINK said the Government intended to introduce measures for the conservation and better use of the country's water resources, the improvement of the administration of water supply, the further extension of public water supplies and sewerage in rural localities, and the better management of rivers. The Government's proposals were largely derived from the reports of the Central Advisory Water Committee. Twenty-nine River Boards would take over the powers for prevention of river pollution, for which some 1,600 authorities at present were responsible. There was in the country ample water for all needs. What Parliament had to do was to protect and control the resources and see they were equitably distributed. A Bill would at once be produced to provide substantial Exchequer assistance for the extension of rural water supplies and sewerage. There would be general legislation in the next Session. Some 2,000,000 people in England and Wales had not piped water supplies in their houses or within easy reach.

Arguing against the proposal that there should be a National Water Board Mr. R. S. HUDSON said water could not be divorced from housing, health, and drainage, which were the concern of the Ministry of Health.

On May 4 Mr. Willink introduced the Rural Water Supplies and Sewerage Bill.

### Patulin Clinical Trials

Answering Colonel Lyons on May 4, Mr. ATTLEE said that, in view of the inconsistent results of preliminary trials of patulin in the treatment of common colds, the Medical Research Council accepted an invitation to organize and control clinical trials on a larger scale. These trials had been in progress during the winter months in industrial establishments and in a small number of schools. Results were being analysed, and a statement might be possible soon. Patulin was not at present generally available. Unless there was definite evidence of its value, production on a large scale could not, under present conditions, be justified.

### National Health Service and Workmen's Compensation

On May 3 Dr. MORGAN asked whether the Minister of Health, in planning for the new National Health Service, considered the advisability of taking steps for Workmen's Compensation for health workers exposed to infectious diseases and ailments in the course of and resulting from their occupation; and whether his Department had submitted a request to the special Home Office Workmen's Compensation Committee for the scheduling of pulmonary tuberculosis as an occupational health risk in sanatoria and other institutions. Miss HORSBROUGH replied that the scheduling of diseases under the Workmen's Compensation Act was a matter for the Home Secretary. The principle always followed—and endorsed by Departmental Committees on the subject—was that diseases to be scheduled must be so specific to the particular employment that their cause by that employment could be established in individual cases. This could not be applied to the ordinary infectious disease or tuberculosis. Mr. Willink had made no recommendations to the Home Secretary. She did not think that the National Health Service proposals affected the principle involved.

### B.M.A. and the Ministry of Health

On May 11 Dr. RUSSELL THOMAS asked Mr. Willink if the Council or any executive body of the B.M.A. acted in a general way in an advisory capacity to his Ministry.

Mr. WILLINK replied that his practice was to consult the B.M.A. on matters affecting the professional interests which it represented. Neither the Council nor any of its executive bodies acted in an advisory capacity to his Department in the manner Dr. Russell Thomas suggested. That was the province of his Medical Advisory Committee and of other special advisory bodies constituted by him for the purpose. He also stated that no member of the B.M.A. was responsible for any part of the White Paper, and that no members of his Medical Advisory Committee were paid as such.

### Serving Doctors' Views on White Paper

Mr. SHEPHERD inquired on May 11 what the Minister of Health was doing to ensure that medical officers, either prisoners of war or serving in the Forces, were given full opportunity of expressing their opinions on the proposed new health services.

Mr. WILLINK replied that the B.M.A., with the co-operation of the Service Departments, had sent copies of the White Paper

—provided by his Department—to all doctors normally domiciled in this country who were serving in the Forces or were prisoners of war. The Association invited the opinion of these doctors on the proposals. Views received would be collated and the results made available in his discussions with the profession's representatives.

### Nuffield Trust Surveys

Asked on May 11 by Mr. MESSER what were the terms of reference of the Nuffield Trust Hospitals Survey Committee and if any limitation had been placed on the surveyors, Mr. WILLINK said the special committee of the Trust had been concerned with the position arising out of the Government's statement on hospital policy in October, 1941, and in particular with the arrangements for hospital surveys conducted by the Trust on his behalf. The work of the surveyors was to survey the hospitals (other than mental hospitals and mental deficiency institutions) and to advise what modifications or developments of the existing facilities would be needed to provide a co-ordinated hospital service.

### Leprosy in Tanganyika

Mr. CREECH JONES inquired on May 10 what steps had been taken in Tanganyika as a result of the investigations of Dr. Muir into leprosy five years ago. Colonel STANLEY replied that after Dr. Muir's visit in 1938 it was agreed between the East African territories that a leprosy specialist for East Africa should be appointed, but no appointment had as yet been made owing to war difficulties. A recent conference of directors of medical services raised the question again, and the Government of Tanganyika expressed its willingness in the Legislative Council to appoint a whole-time specialist for Tanganyika if a suitable man could be obtained. That Government also decided, as a result of Dr. Muir's visit, to set up two main leper settlements under Government operation. One of these had already been established in the Southern Highlands Province for 1,100 patients. It was intended to establish another in the region of the central railway line. The settlement at Chazi was established in 1941 by lay workers paid by the British Empire Leprosy Relief Association, with the assistance of the native authorities. The site was discovered to be malarious and too remote for effective medical supervision, and it was therefore regarded as unsuitable for development as a Government station, and a decision was taken to close it. In view of the delay in finding a suitable site for a permanent station this settlement at Chazi was being continued as a temporary measure. There were at present 14 leper settlements or camps in the country maintained by Government or native authorities and 15 by missions. Compulsory segregation was not in force; the Governor reported that it would in any case be impracticable, and modern practice was generally not in favour of wholesale segregation, especially where considerable numbers of non-infectious cases might be involved.

**Removal of Smallpox Cases.**—On April 25 Mr. VIANI asked the Minister of Health the date or dates of the removal to Clandon of the patients or nurses at, or connected with, Mount Vernon Hospital found to be suffering from smallpox, and the dates of death of the two fatal cases. Mr. WILLINK: One case was removed to Clandon Isolation Hospital on March 1, four on March 2, one on March 3, two on March 12, one on March 13, and one on March 15. Of the cases taken to Clandon, the patient admitted on March 1 died on March 3, and one of the four patients admitted on March 2 died on March 6.

**Disposal of Infected Sputum.**—Replying on April 26 to Dr. MORGAN, Mr. WILLINK said that attention to the sterilization and disposal of sputum was an elementary principle in the treatment of tuberculosis. In any inspection of tuberculosis institutions by his medical or nursing officers inquiry about it was made as a matter of course, and any necessary advice was given. His medical advisers were fully apprised of modern developments in this matter. He had recently arranged, through his Standing Advisory Committee on Tuberculosis, for a statistical inquiry into the incidence of tuberculosis among sanatorium nurses. Dr. MORGAN asserted that in some institutions with tuberculous patients round about the London area the sputum was sterilized by dry-heating the mugs containing the sputum in the kitchen of the institutions where patients' meals were prepared and cooked. Mr. WILLINK said he was not aware of such circumstances, and such a practice was much to be deprecated. If Dr. Morgan gave particulars of any institution in which it had come to his notice, he would look into the matter.

### Notes in Brief

The Minister of Health announced recently that the proportion of insured persons who have not chosen panel doctors is at present about 6%, but probably most of these are recent entrants into insurance who will exercise their right of choice at some future time. The average proportion before the war was between 2 and 3%. No information is available as to the proportion of insured persons who choose a doctor but do not make use of his services.

No. 17

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended April 29.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of:

are for: (a) The 126 great towns i

(b) London (administrative county).

The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	71	14	32	3	1	86	3	22	5	5
Deaths .. ..	2	2	1			—	—	3		
Diphtheria .. ..	628	29	163	91	29	667	42	186	98	23
Deaths .. ..	5	5	3	3	1	13	2	1	1	1
Dysentery .. ..	218	37	79	—	—	135	11	65	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	3	—	—	—	—	3	—	—	—	—
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Erysipelas .. ..	—	—	42	4	4	—	—	46	9	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	49	12	8	10	4	72	14	4	15	1
Measles .. ..	2,055	207	559	214	19	13,104	770	340	7	38
Deaths .. ..	2	—	—	8	—	16	3	2	—	—
Ophthalmia neonatorum .. ..	80	5	17	—	—	72	8	22	2	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	4	—	2 (B)	—	1 (B)	2	—	—	—	—
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenzal* .. ..	711	49	11	10	6	906	37	8	5	6
Deaths (from influenza) .. ..	7	—	5	—	—	23	—	5	1	—
Pneumonia, primary .. ..	—	—	205	30	—	—	—	224	9	—
Deaths .. ..	—	31	16	17	—	—	41	14	14	—
Polio-encephalitis, acute .. ..	2	—	—	—	—	3	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute .. ..	9	—	1	1	—	1	—	1	4	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	5	15	—	—	—	3	21	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	164	10	27	1	—	137	7	17	2	—
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,764	120	213	24	66	1,683	164	221	39	40
Deaths .. ..	2	—	—	—	—	3	—	—	—	—
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	9	—	2	6	7	16	2	11	2	1
Deaths .. ..	—	—	—	—	—	1	1	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,397	223	241	70	27	1,640	116	145	11	18
Deaths .. ..	16	5	6	5	2	15	—	1	2	1
Deaths (0-1 year) .. ..	367	57	61	39	37	368	45	71	51	22
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding still-births) .. ..	4,314	640	565	211	149	4,341	649	602	213	126
Annual death rate (per 1,000 persons living) .. ..	—	—	13.0	13.8	†	—	—	13.6	14.0	†
Live births .. ..	7,798	927	1,018	638	310	6,670	764	1,095	380	272
Annual rate per 1,000 persons living .. ..	—	—	20.7	—	†	—	—	22.4	25.0	†
Stillbirths .. ..	250	23	38	—	—	228	24	38	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	36	—	—	—	—	34	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## EPIDEMIOLOGICAL NOTES

## Discussion of Table

In England and Wales there was a very large fall of 729 in the notifications of measles. Compared with last week 118 fewer cases of pneumonia were recorded, but 157 more of scarlet fever, 76 more of whooping-cough, and 14 more of dysentery.

The lowered incidence of measles was general throughout the country, but was specially marked in Lancashire, Kent, London, and Middlesex, which reported respectively 161, 88, 76, and 67 fewer cases than last week.

In Yorks West Riding there were 53 more notifications of scarlet fever than last week. The fall in notifications of acute pneumonia continued to be greatest in the south; the returns for this disease in the combined south-eastern and south-western counties have fallen by over 50% during the past three weeks. Yorks West Riding, with a rise of 25 cases, supplied the only large variation in the incidence of diphtheria.

Notifications of dysentery in the outbreak in Derbyshire, Heanor U.D., rose from 12 to 30. The other large returns were those of London 37, Lancashire 23, Surrey 19, Hertfordshire 11.

In Scotland the only rises in incidence were of scarlet fever and of whooping-cough, respectively 24 and 63 more cases than last week. The increase in scarlet fever was fairly general, while that for whooping-cough occurred mainly in Glasgow, where the notifications rose from 95 to 165. In Glasgow there was also a big drop of 73 in the measles notifications. The total notifications for dysentery fell by 16, but the incidence remains at a high level; the largest returns were Edinburgh 26, Glasgow 14, Renfrew County 17.

In Eire the total notifications of diphtheria and measles fell by 14 and 49 respectively, while those for whooping-cough rose by 23.

## Diphtheria in Scotland

According to the Secretary of State for Scotland 756 cases of diphtheria, of which 5 were fatal, occurred during the second half of 1943 in immunized children up to 15 years of age, and 69 cases with no deaths in immunized persons over that age. The position as regards non-immunized persons was:

	Cases	Deaths
Children up to 15 .. ..	1,599	85
Persons over 15 .. ..	922	15

The numbers of immunizations against diphtheria recorded in Scotland during the years 1941 to 1943 are:

	Under 5	5 to 15	Total
1941 .. ..	153,913	464,792	618,705
1942 .. ..	57,690	71,892	129,582
1943 .. ..	29,826	16,060	45,886

Mr. Johnston furnished the following figures on May 4:

	1942	1943
Deaths from smallpox in Scotland .. ..	25	Nil
" " post-vaccinal encephalitis .. ..	13	1
" " other effects of vaccination .. ..	5	2

## Smallpox in Naples

Forty-eight cases of a mild type of smallpox were reported in Naples during the three weeks before May 7. No death have been reported. There were also 5 cases of smallpox in Taranto, where 2 deaths have occurred.

## Week Ending May 6

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,646, whooping-cough 2,432, diphtheria 548, measles 2,035, acute pneumonia 680, cerebrospinal fever 72, dysentery 259, paratyphoid 4, typhoid 5.

## "Air-borne Infections"

Air travel has made it necessary to consider new safeguard against the incursion into this country of major epidemic diseases, such as smallpox or typhus, since it is now possible for a person contracting such a disease abroad to arrive here by air and proceed to his destination before expiry of the incubation period and before the manifestation of symptoms. No such case has yet come to notice, but the Ministry of Health has adopted precautionary measures. In future a person arriving by air in this country will be given a card containing a warning notice that if he falls ill during the 21 days after arrival he should immediately consult a doctor and hand the card to him. This card asks the doctor at once to inform the appropriate

Medical Officer of Health if any acute notifiable disease is found or suspected.

Certain particulars are entered on the card before it is handed to the passenger, which in conjunction with other measures will make it possible to bring contacts who were fellow passengers on the same aircraft under medical surveillance if the case notified is one of smallpox, typhus, plague, or cholera.

## Medical News

At a meeting of the Medical Society for the Study of Venereal Diseases to be held at 11, Chandos Street, Cavendish Square, W.1, to-day (Saturday, May 20), at 2.30 p.m. Prof. A. Fleming will give an address on penicillin.

The annual general meeting of the Socialist Medical Association will be held at the Large Conway Hall, Red Lion Square, W.C.1, on Sunday, May 21, at 11 a.m. The morning session will be for members only, but the afternoon session, from 2.30 p.m. to 5 p.m., when there will be a discussion on the White Paper, will be open to all.

The Food Education Society announces that on Monday, May 22, at 3 p.m., in the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, Mr. Vernon Charley, Ph.D., will give a public lecture on "The Contribution of Fruit and Vegetable Juices to Health in War and Peace."

At a meeting of the Eugenics Society on Tuesday, May 23, at 5 o'clock, in the Rooms of the Royal Society, Burlington House, Piccadilly, W., Dr. Margaret Hadley Jackson will speak on a medical service for the treatment of involuntary sterility. All interested in the subjects are invited to attend.

At a lunch discussion at the Housing Centre, 13, Suffolk Street, Haymarket, S.W., on Tuesday, May 23, at 1.15 p.m., Alderman W. Hyde, trustee of the Nuffield Provincial Hospital Trust, will speak on health services and town planning.

The 45th annual meeting of supporters of the Lebanon Hospital for Mental Diseases (Astruryeh, near Beirut) will be held on Thursday, May 25, at 5 o'clock, in the Hastings Hall of B.M.A. House, Tavistock Square, W.C.

At the next meeting of the Medico-Legal Society to be held at Manson House, 26, Portland Place, W., on Thursday, May 25, at 5.30 p.m. Dr. Robert Forbes will read a paper on "The Medico-Legal Aspects of Artificial Insemination." Members may introduce guests; tea at 5 o'clock.

The new British Council medical film, *Accident Service*, will be shown at the Curzon Cinema, London, W.1, at 5 to 6.30 p.m. on Friday, May 26, and will be introduced by Sir Alfred Webb-Johnson. A limited number of tickets are available and may be obtained by application to the Medical Department, the British Council, 3, Hanover Street, London, W.1. The film is concerned principally with the miners' rehabilitation centre at Berry Hill Hall, and has been made with the closest collaboration of Mr. E. A. Nicoll, the director of the centre. *Accident Service* will be preceded by a film called *Cambridge*.

A refresher course in tuberculosis for tuberculosis officers and medical practitioners will be held on June 13, 14, and 15, at Girton College, Cambridge, and Papworth Village Settlement. After opening remarks by Sir Walter Langdon-Brown, the following lectures will be given in the mornings at Girton College: "Differential Diagnosis of Pulmonary Tuberculosis," Group Capt. R. R. Trail; "Some Medical Problems in the Administration of Tuberculosis Schemes," Dr. Norman F. Smith; "Diagnosis by X Rays," Dr. Peter Kerley; "Rehabilitation and Local Authority Schemes," Dr. F. R. G. Heaf; "Non-pulmonary Tuberculosis," Prof. J. Paterson Ross; "Collapse Therapy," Mr. J. B. Hunter. Demonstrations will be given each afternoon at Papworth. The fee for the course is £2 2s. As accommodation is strictly limited, applications should be made as soon as possible to Dr. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1.

The British Council has been permitted to print a small edition of *British Medical Bulletin* for sale in the United Kingdom. It is estimated that the current (1944) volume will contain about 280 foolscap pages, plus an index. It will appear in not more than 12 parts. As no advertising matter is accepted, the cost of the *Bulletin* is relatively high. The subscription for the whole volume is 21s., and 14s. for the volume less those parts (1-4 inclusive) which have already been published. Single parts may be purchased at prices based approximately on 2s. for a 24-page issue. The British Council points out that the primary purpose of *British Medical Bulletin* is to interpret British medicine to the overseas reader who would not normally consult the medical journals published in this country. It contains reviews, abstracts, book notes, and a list of the contents of current British medical and cognate journals. Copies of the *Bulletin* are already available for consultation in most medical libraries. Application for annual subscriptions or for single parts should be addressed to B.M.B., 3, Hanover Street, London, W.1.

## Letters, Notes, and Answers

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### ANY QUESTIONS?

#### Vesiculation after Vaccination

**Q.**—If a vaccination with calf lymph does not result in vesiculation, but merely in slight erythema, can one assume that the person will be immune from smallpox?

**A.**—After vaccination three kinds of lesion may occur: (1) typical vaccinia, where vesiculation begins about the fourth or fifth day, is accompanied by considerable local reaction, and progresses to scabbing about the 10th day; (2) an accelerated, or vacenoid, lesion, where some immunity exists, and the reaction (papules and vesicles) reaches its height in three to five days; and (3) an evanescent lesion occurring within twelve to twenty-two hours, known as the reaction of immunity and characterized by local erythema or a few papules, but without vesiculation. This last is presumably the type of reaction described by the questioner, and it indicates a high degree of resistance to smallpox. To make sure, however, that this slight lesion is not merely a reaction to local trauma from the scarification, vaccination should be repeated, particularly if the patient is an infant being vaccinated for the first time. In a susceptible person vesiculation must occur before vaccination can be regarded as successful. Thus Henderson and McClean (*J. Hyg.*, 1939, 39, 680), who inoculated volunteers intradermally and subcutaneously with a specially purified vaccine lymph, found that immunity to subsequent vaccination by scarification was obtained only if there were vesicles at the site of the primary inoculation. Vaccinia virus seems to multiply specifically in the skin, and an epidermal lesion is essential for successful vaccination.

#### Otitis Externa

**Q.**—Would you briefly outline the causes and treatment of otitis externa?

**A.**—Common types of external otitis are: (1) *Furunculosis*. Treated by insertion of wick soaked in glycerin and mag. sulph. paste changed daily; and hot fomentations or other heat. Incision avoided if possible. (2) *Erysipelas and cellulitis of meatus*. Reduce swelling by packs of 2% aluminium acetate solution. Later paint in 1% aqueous sol. gentian violet. (3) *Impetigo*. Paint or drop in 1% aqueous sol. gentian violet after cleaning. (4) *Eczema*. Clean, and then paint in a zinc preparation—e.g. linimentum calamineae, to which may be added a coal-tar preparation for pruritus, as desired. (5) *Seborrhoeic dermatitis*. Often associated with similar condition of scalp, which must be treated locally—e.g. lin. calamineae, with occasionally an ointment containing 1% acid salicyl.

#### Cousin Marriage

**Q.**—I have been consulted by a man who wishes to marry his first cousin, the daughter of his mother's brother. He is anxious to know if this degree of consanguinity would have any adverse effect upon the possible family. Would they be peculiarly liable to any defects, mental or physical, or to any disease in particular? So far as I know both parties are healthy.

**A.**—Marriage between blood-relatives differs from any other marriage only because the partners tend to carry more of the same hereditary factors than do unrelated people. There is no doubt that in the human species there exist many undesirable recessive genes. Individually they are rare, however. Thus, should one partner carry such a gene, the chance that an unrelated person will carry the very same gene is very small. Only when both do so can the defect appear in the offspring. But if the person bearing the gene marries a first cousin, the chance is one in eight that that person will carry it also. The possibility that an undesirable recessive trait may appear in the offspring is one of the inescapable risks inherent in any marriage. It is certainly much increased in a consanguineous marriage. Full knowledge is not yet available, but the indications seem to be that harmful recessive genes are not numerous enough to make that risk, though increased, more than a small one.

absolutely. It does not appear to be the sort of risk that ought to deter the informed person, and it would be a bold physician who would advise against a cousin marriage simply because it was a cousin marriage. One important point might be stressed. If the cousins do marry, and if they should prove unlucky, they will be left in no doubt. Provided, as will be true in the great majority of instances, that no recessive defect appears, they should not blame their blood-relationship for any of the ordinary disappointments, physical or mental, which may attend the development of their children.

Of course, should the joint family history reveal the occurrence of defects possibly due to recessive genes, a more detailed investigation of the particular case would be necessary.

#### Pilonidal Sinus

**Q.**—What is the prognosis of an untreated pilonidal sinus? What are the chances of complete cure in radical operation? Is there any palliative treatment short of complete excision? Why is pilonidal sinus so rarely mentioned in the JOURNAL? Is it so rare in England? I have seen quite a number of cases here (in Malta).

**A.**—A pilonidal sinus is unlikely to heal spontaneously, the common story being of repeated inflammatory attacks. Palliative treatment can consist only in the antiphlogistic measures adopted during the attacks of inflammation. Unfortunately it is impossible to guarantee cure even after a radical operation, though it is true that the more thoroughly the operation is performed the less the likelihood of any recurrence. The track is often difficult to follow, even with the help of dyes, and in many instances the coccyx has to be partially excised to ensure its complete eradication. Pilonidal sinus is quite common in this country; there have been some articles published on the subject, though it is true that they have not been in proportion to the frequency of the condition. It is one of those backwaters of surgery which attract few explorers.

#### Diagnosis of Night Blindness

**Q.**—A policeman, promoted sergeant, had to revert to constable shortly after promotion because of alleged night blindness; and very soon afterwards he had to leave the service for the same reason. He is a strong, healthy man with a good appetite, and his diet has always included more than adequate vitamins A and D. There was no complaint of night blindness when he had to do night duty as a constable. There appears to have been no attempt at treatment, and I cannot convince myself that he is, in fact, night blind. There are no apparent changes in cornea, lens, media, or retina, and an oculist to whom he was sent replies, "I have no means of ascertaining his adaptation for dark vision." What are likely to be the causes—other than psychological—of sudden onset of nyctalopia, and how can its existence be proved or disproved (especially in a possible malingerer)?

**A.**—Night blindness is a very difficult condition to assess. The scientific methods of estimating night vision are too complicated for general use. Those of less complexity tend to suffer from a lack of exactitude which would render them suspect in a court of law. The difficulty in the case of suspected malingerer is that, when special apparatus is used, the patient realizes the nature of the test, and one's judgment is largely dependent on the answers given. The following technique, requiring the minimum of divergence from the normal routine of eye testing, may be of some help. Refract the patient in a completely dark room using as dim a light as possible or placing the refraction lamp as far from the mirror as feasible. Prolong the examination short of arousing the patient's suspicions so that his eyes shall become as dark-adapted as possible. While the room is still darkened, put on the trial frame if not already in position and slip in the appropriate lenses. It is suggested that "fogging" should be used—i.e., too strong a plus lens or too weak a minus lens—together with a really dark glass or Crooks B2 and B together. At the same time the patient should be told that the usual illumination is being used on the test type, which is only switched on after the dark glass had been placed in position. Assuming that the examiner's night vision is good, a comparative estimate of the patient's night vision can be obtained.

The cases of true night blindness where there may be difficulty are practically confined to retinitis pigmentosa sine pigmento and congenital nyctalopia. In the former there is absence of any pigment, but the usual progressive attenuation of the retinal vessels and increasing optic atrophy and blindness. In the latter there are no observable changes in the fundus and no progression to blindness.

It has been shown that unless there is gross lack of vitamins A and D treatment with them is of little avail.

#### Treatment of Parkinsonism

**Q.**—I have heard that a Continental treatment for Parkinsonism is to draw off 10 c.c.m. of blood from the patient, wait till R.B.C.s have settled, and then inject the serum intramuscularly. I can find no literature about this treatment. Is there anything in it?

**A.**—No, there is not. A host of treatments have been tried, since the condition is so common, chronic, and disabling; and besides auto-serum therapy, vaccines, non-specific protein therapy, and

fixation abscesses have been tried. A full account of the literature will be found in the first three reports of the Matheson Commission for Encephalitis Research (New York 1929, 1932, and 1939).

#### Paraldehyde Intravenously

**Q.**—We are informed that paraldehyde given by intravenous injection is an effective hypnotic in cases of delirium not responding to morphine, hyoscine, etc. Can you confirm this and describe the mode of administration?

**A.**—Paraldehyde may be given intravenously and thus induces sleep very rapidly. The usual dose is 4 c.c.m. as a 10% solution in saline. The effect usually passes off in two to three hours. The injection may be repeated.

#### Rosacea associated with Seborrhoea

**Q.**—What is the most up-to-date treatment for rosacea in a woman who for many years has suffered from seborrhoeic dermatitis of the scalp also? Is there any connexion between the two ailments? State of digestion and condition of bowels and kidneys are normal.

**A.**—Rosacea occurs in seborrhoeic subjects and is therefore usually associated with seborrhoea of the scalp. A 2% sulphur and salicylic acid ointment attacks the seborrhoeic basis and improves the facial eruption. Small doses of x rays given by an expert are beneficial. Condiments, hot drinks, tea, and coffee should be excluded or reduced. The psychological factor influencing the flush reaction should not be forgotten.

#### Dacryocystitis and Sulphonamides

**Q.**—In the JOURNAL of March 11 I find an article on the use of the sulphonamides in ophthalmia neonatorum (p. 353). I think I read somewhere that they can be used in cases of dacryocystitis. If so, can you tell me the dosage internally, and whether there is anything against their use in this condition?

**A.**—The sulphonamides are of no value in the treatment of the chronically inflamed mucosa and of the mechanical obstruction in chronic dacryocystitis. In acute dacryocystitis there is generally pus formation, and this requires incision and packing. The sulphonamides are useful as an immediate post-operative measure in these cases in helping to clear up the residual infection. The initial dose for adults is 2 g., and a maintenance dose of 1 g. 4-hourly for two to three days. Sulphanilamide powder might with advantage be introduced whilst packing the wound.

## LETTERS, NOTES, ETC.

#### Fluorine in the Diet

Major G. C. PETHER, R.A.M.C., writes: Some years ago, while on holiday in Derbyshire, I visited some quarries in the millstone-grit area east of the Derwent. In many of these grindstones were made, and I understood that these were used both for metals and for grain. But inquiry at a local flour mill showed that no local stone had ever been used there, though in the past imported French burr stones had been used, these now being replaced by steel rollers. I believe the French stone contains fluorine, and a calculation was made to correlate the rate of wear of the stone with the quantity of flour produced. I have forgotten the figures, but evidently flour thus produced will contain a quantity of finely divided stone which is possibly absorbed. This source of fluorine has almost disappeared from our diet because most flour is ground by steel rollers now. I understand that mineral deficiencies in plants may often be discovered from examination of their foliage. If fluorine deficiency can be detected in this way then foodstuffs which have too little fluorine could be improved by suitable fertilizers. Dental surgeons will no doubt study the diseases of bone attributed to fluorine deficiency or excess.

#### First-aid Textbooks

Mr. F. E. EVANS (Northolt) writes: As a "first-aider" of many years' experience may I be permitted to add a few words to the correspondence on first aid as taught in the textbooks of St. John B.R.C., St. Andrew's, etc. It is well known among all experienced non-medical instructors of first aid that these textbooks are merely methods of instruction. The novice is instructed by these orthodox methods only as means of gaining an end—i.e., as a form of drill to enable him to become efficient and to use his own initiative controlled by existing circumstances when and where a casualty should occur. After all, it does not need much imagination to be able to substitute, say, a rifle for a long Liston's splint in a fracture of a wound of the thigh, or use a bayonet scabbard when a forearm is injured. It is essential that a form of drill should be used to gain that trained mind which will enable a "first-aider" of only small experience to improvise by whatever means he has to hand, and these textbooks are undoubtedly the best material we have at present on account of their more or less uniformity. I do agree, however, that some of the chapters, particularly that on burns, could be revised in view of the experience that has been gained in the present war.

# BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 27 1944

## WITH THE EIGHTH ARMY IN THE FIELD\*

BY

Brigadier CHARLES DONALD, O.B.E., Ch.M., F.R.C.S.

*Consulting Surgeon, Army Medical Service*

To journey through the Western Desert, into Tripolitania and Tunisia, across to Sicily, and up into Italy with the Eighth Army was a great privilege. No one could travel in that fine company without an ever-present pride in the British fighting-man. His feats of arms are well chronicled. To those travelling closely in his wake the wonder ever grew at the sight of the obstacles he overcame and the defences he stormed. Added to these he had the changing yet constant privations of the field and of the front line, heat and sandstorms, cold and mud, forced marches and tedious delays, pestilential flies, shortage of water, monotonous though ample rations, and other lesser trials. He deserved then, when he was wounded, the best that could be offered.

It is not easy to describe the efforts made to provide surgery worthy of the patient. The shifting backgrounds prove hard for the writer to depict and for the unacquainted reader to visualize and understand. Surgery in the field is influenced by many external circumstances. Some of these at first-sight must appear almost ridiculous to the civilian surgeon. It thus becomes a specialty, not, by and large, a highly difficult technical specialty, but a specialty none the less. Any surgeon whose experience is purely civilian must approach it with a mind open to change. Otherwise there will be disappointments, and quite likely disasters.

Field surgery I would define as the care and treatment of the soldier from the time of wounding to his arrival at the base hospital area in which he will complete his treatment and be returned to duty or invalided. The term "forward surgery" I prefer to restrict to the original primary operative treatment. There is need for such distinction, especially in any description of these campaigns. For such base hospital areas were hundreds, often thousands, of miles from the fighting. It might be a matter of weeks before the wounded reached the base. Sometimes that was due to military difficulties and exigencies. Sometimes it was deliberate: many a man owes his life to being held and nursed in the field. There is thus more to be thought of than the primary operation. There is the treatment afforded over a period of time and often at a series of points in a varying and sometimes prolonged chain of evacuation which is still "in the field." Field surgery thus embraces forward surgery and maybe much more besides.

The aims of field surgery are to save life and limb, to give such treatment as will promote rapid healing where these are unlikely endangered, and to ensure that the patient passes in comfort to the base. It is a slight catalogue, but the thought and organization needed to achieve a high standard are immense, and affect the administrator as much as, or even more than, the surgeon. Ever-varying conditions call for flexible and adaptable minds. What was done in the last war in France did not necessarily suit the desert; what was done in the desert did not necessarily suit Italy.

### THE CAMPAIGNS

The period dealt with covers the three campaigns in Africa, Sicily, and Italy. In the last it deals with events up to the

"winter line" of 1943-4. The first, to save confusion with the First Army, also in North Africa, will not unfittingly be termed here the Desert Campaign. A short description of the campaigns from a surgeon's point of view is an essential prelude to more specialized considerations.

### The Desert Campaign

The Eighth Army advanced from el Alamein to Tunis, some 2,000 miles, in under seven months. To understand how surgery kept up with this it is necessary briefly to go back a little. The essence of desert warfare is mobility. In the earliest desert campaigns, with their swift and far-moving thrusts and counter-thrusts, the weakness of relatively immobile cumbersome casualty clearing stations had been shown up. New methods were needed. Surgery, like the fighting services and supplies, had also to be put on wheels. By the time of el Alamein there had gradually been developed by the previous consulting surgeon to the Middle East Forces, Major-Gen. D. C. Monro, a group of mobile units. This had been done by giving the light sections of some casualty clearing stations their own transport, and by the formation of small mobile field surgical teams. The latter consisted of surgeon, anaesthetist, a few trained orderlies, a staff car, and a lorry in which to carry gear, surgical and personal. While the mobile light sections were able to function autonomously the field surgical teams were independent in name only. They constituted a fluid mobile surgical potential, usable where most needed but dependent for many things on some host unit. This latter was either a casualty clearing station which needed surgical reinforcement, or the main dressing station of a field ambulance when the team was being used as a detached forward surgical centre. Their mobility was given them especially for the latter purpose. They could then keep up more closely with the fighting, and at field ambulance level afford surgery to casualties whose further journey back to the casualty clearing station would be lethal or hazardous. In practice later about half of these teams reinforced casualty clearing stations; half worked more forward at main dressing stations. The mobile light sections of casualty clearing stations could act similarly but more independently.

Like the progress of science the desert advance was a succession of jumps. Static sometimes for a month or more, the army would suddenly leap to action and in a week or two move forward a few hundred miles. The dispositions of surgical units thus varied. The static periods represented preparation for stiff battles to be fought, such as, more particularly, el Alamein, Mareth, and the Wadi Akarit. Casualties in formidable numbers had then to be anticipated. In the intervals there were pursuits, with minor enemy rearguard actions and few casualties. Accordingly the same alternating disposition of units was repeated several times. At the set pieces there was a concentration of casualty clearing stations some 15 to 30 miles behind the line and in front of this, at suitable points, field surgical teams with some of the main dressing stations. When the break through occurred the latter moved forward with their field ambulances, and the casualty clearing stations moved one by one, in leap-frog fashion, until they were stretched out as

\* Based upon experience as forward consulting surgeon, M.E.F. and A.F.H.Q., in October-November, 1942, and January, 1943, to February, 1944.



a chain of daily staging posts back to the base, the railhead, an embarkation point, or an advanced base. By the time the next set battle was to begin they were, in more or less degree, gathered into a similar concentration, linked backwards to some fresh disposal point. This was a campaign mainly on a narrow front with few lateral roads. Only occasionally did outlying units require to be sited far from the main coast road.

Thus surgery kept up with the fighting-man and watched him on his often-protracted journey to the base. The railway track was soon left behind. Benghazi harbour took some time to be clear for hospital ships. Tripoli to Benghazi is 700 miles of bleak desert road. Tripoli harbour also needed clearing. There was still a long stretch of desert road before Sfax and Sousse and the pleasant greenness of Tunisia.

The difficulty to both medical administrator and surgeon lay in the long road evacuation that was often necessary. To the former it meant the diversion of casualty clearing stations and field ambulances to act as staging posts; to the latter it meant that his patients would undergo an added strain on their strength and resistance, a strain which it was essential to ease for the seriously wounded. While the administrator has to keep the forward areas as clear as possible, the surgeon, knowing the value of rest, wishes to have little or no movement for his post-operative patient. A trite saying occasionally expressed, that the most efficient casualty clearing station is an empty one, pays little heed to sense and less to humanity. There must be give and take between administrator and clinician. In the Eighth Army a happy and harmonious balance was achieved.

The desert campaign was essentially a tented affair for casualty clearing stations and field ambulances. Rarely were there suitable buildings. Operating vehicles were gradually discarded as cramping and labour-making. The difficulties associated with tents were the limitations set by the necessary tent-poles, the absence of floors, the regulation of warmth, lighting and blackouting, fly-proofing and sand-proofing, and dispersal. These would take much description, just as they took much labour to overcome. Most would agree to flies and sandstorms as the greatest trials. Dispersal of tents, to limit damage by possible bombing, was an irksome handicap. Too wide dispersal slowed the tempo, particularly of the operating theatre. To have pre-operative and post-operative tents at a distance, even 50 yards, from the theatre was tiresome and annoying, especially in a moonless period. It could be ridiculously easy to get lost in darkness "black as Egypt's night."

Gradually, as the Luftwaffe waned, pre-operative and post-operative tents, to cope with serious casualties, were brigaded to the theatre. The surgeon could then keep an eye on what was to come and what had gone, without passing across a blackness filled with the snares and gins of guy-ropes and slit-trenches, did he veer from the straight and narrow. The Luftwaffe's activity was restricted to night excursions, and there was gradually diminishing annoyance from this quarter. But it was early found advisable to pitch theatres well away from the main road, which naturally was a guide to a bomber, his machine-guns, and his cannon-guns.

It would have been ideal to be followed up at a close distance by general hospitals which could retain and nurse the patients. This was impossible to any great extent. If the enemy is retreating he must not be let rest. Fighting materials and stores must come first. Supply difficulties in this campaign were enormous. It was a German general who said that the desert was a tactician's paradise and a quartermaster's hell. A general hospital set up near Benghazi was in a few weeks 800 miles behind. The fall of Tripoli gave the much-prized opportunity of an advanced base for supplies and services. Till then everything, except limited urgent stores which were flown, had come up the 700-odd miles from Cyrenaica by road. Hospitals were set up in suitable buildings in Tripoli as soon as possible. Before they could all be established the hunt was well on. The earliest were soon full—sick have to be thought of as well as wounded—and all served until the end more as casualty clearing stations than as retaining hospitals. But they could deal with special casualties in a more satisfactory fashion, and they could retain those whose need was great, before evacuating them by ship. Later, when the battle had gone some 300 miles beyond Tripoli, hospital ships put into Sfax to obviate the need for the long road journey.

It would be a pity to leave this background of the desert campaign without trying to recapture the feeling of enthusiasm in the medical units. They vied with one another to put up the best show and to get the best seats at the drama. Full of zest for the chase, they were cock-a-hoop when moved to the front of the procession; left behind, they good-humouredly cursed their lot and settled down to what they derisively called "coffee-stalling." "Coffee-stalling" was important and necessary, and they knew it. But there was not the relish of being up with events and dealing with fresh casualties with the sound of the guns ahead. The medical units came from the United Kingdom, from New Zealand, from South Africa, from India and, for a short time, from Australia. Of the great Dominion only Canada was not represented; she was soon to be.

### The Sicilian Campaign

The now-well-established mobile field surgical units and light sections of casualty clearing stations, born out of necessity for desert warfare, fitted well into the diffuseness of the earliest days of the Sicilian invasion. They landed at different points with field ambulances and were immediately dealing with the most serious casualties. Scaled down to a reasonable minimum of equipment, some of the early units had to wade ashore carrying their panniers. Their transport followed quickly from the landing-craft. Lying off the invasion beaches were hospital ships and carriers. These were fed with casualties by craft plying between them and the shore, and their surgical staffs, reinforced by extra teams for the occasion, wasted no time in getting down to work which they continued to perform during the voyage to Africa or Malta.

The early rapid advance of the fighting troops allowed the getting ashore of the full strengths of the casualty clearing stations in the next few days. Certain of these followed the fighting upon the wide front, again with some field surgical units a little ahead; others, after bearing the brunt of the initial days, stayed and established a medical centre in Syracuse, to which the foremost transferred their patients for further transmission by ship. Within a fortnight general hospitals were beginning to arrive and to take up position in and around Syracuse.

The conditions in Sicily for the fighting troops were not enviable. The weather was oppressively hot, the close vegetation made it stifling, there was a high humidity, the flies were more numerous and vicious than anyone even from Egypt could have imagined, and the filth in the villages was widespread. Small wonder was it that everyone sighed, as they had thought they never would sigh, for the open spaces of the desert and the Mediterranean breeze which here seemed stifled. On and on, march and fight, fight and march, with little sleep the infantrymen pushed over rugged country. The enemy was to be given no respite. The strain our men endured in these pitiless days had its effect when they were wounded. Their resistance was much diminished. The surgical units had kept up with them, but the casualty often had more need of sleep than surgery. Many of those with abdominal wounds, whom from desert experience one would have expected to live, perished out listlessly on the second or third day after operation.

The relative lull in front of Catania, while progress from the west was being made, did not afford as much relief as it might have done. All roads, medically, led to Syracuse. They were poorish roads and wound wearily up and down hill. To the travelling wounded they were a trial, and the haven of rest seen ahead in Syracuse was for many to prove a mirage. For malaria had now become a problem. The general hospitals which had arrived were soon at full stretch. The next phase might require all the beds. Back and forth went the hospital ships and the planes. Only the wounded in immediate danger could be retained for that rest which they all needed and all richly deserved.

Etna dominates all eastern Sicily. With the fall of Catania the mobile units were soon on the move either on the roads flanking the mountain northwards or, the Canadian element, coming in from the west. Again there was rough country with congested difficult roads for the ambulances. Demolished bridges had been relatively few up to now; henceforth they were to be numerous. The rough diversions which had to be used until the engineers had built new crossings, and the delays caused, in the congestion of pursuit, by the new ones' being

one-way only, contributed additionally to the strain on the wounded. The field surgical units were again paying a handsome dividend in obviating such journeys for the bad cases, even though the distance was now only to Catania. Fortunately, the campaign was soon to be over.

For the Sicilian invasion several casualty clearing stations and field surgical units had dropped out of the Eighth Army temporarily and others had taken their place. The latter came either from the First Army, with which they had had experience in North Africa, or from non-fighting areas, either the United Kingdom or lines of communication abroad. There was thus a mingling of surgeons—veterans and novices in acquaintance with war and war wounds. Differences there were bound to be, both between those of the two armies, working on different lines on a different type of front, and between these and the new-comers. What the latter had most to realize, what is so often omitted in systems of war surgery or in training, were the strains and risks of post-operative transportation. The First Army surgeons had been working in a more static way, but in a countryside more cultivated than the desert and more akin to the Sicilian conditions. The little differences were interesting to observe. The new-comers in a few weeks had become hardy veterans.

Surgeons were now working usually, if not always, with a roof over their heads. Schools, monasteries, churches, and

dwelling-houses were the commonest buildings used. Handier in most ways, they had their drawbacks. Cleanliness is not the most striking feature of Sicilian villages. (The most salient feature would have appealed more to the midwife than to the surgeon: Mussolini's bounty had worked wonders, if his Army had not.) The R.A.M.C. orderly who saw a pre-war recruiting poster which read "Join the Army and see the world" and retorted with "Join the R.A.M.C. and scrub it" had every justification in Sicily. But the scrubbing was done, and if sepsis could not always reach satisfactory heights it was not for want of effort. The vexations of taps which did not run, plugs which pulled but gave no issue, globes which did not illuminate, and flies which were ubiquitous did not add to the pleasures of patients, surgeons, and attendants.

#### The Italian Campaign

The Eighth Army initiated the invasion of Italy, on September 3, 1943, with its little-resisted landing in and around Reggio. Again the mobile units found their niche in the early diffuseness, and again, in the rapid race up the forefoot of Italy, they kept in touch. It is not to be imagined that they moved daily, leaving a trail of operated-upon casualties in their wake. They leap-frogged one another. And soon once again there was a chain of staging posts stretching back to the Straits of Messina over some 300 miles. As before, the swifter the pursuit the fewer were the casualties. The race, it will be remembered, was to aid the hard-pressed American Fifth Army at Salerno. Immediately the contact was established the Eighth Army swung to the east coast, and, with Bari and Taranto behind it, the early chain could largely be discontinued. But another was required as the army pushed northward.

The first real checks to progress did not occur till the weather broke; some two months after the Reggio landing. In this time the army had covered some 500 miles. From then on the picture changed. Cold, rain, snow, and mud altered the face

of a countryside previously blessed with the sun and with the fruits of the earth in profusion. The numerous wide dry riverbeds filled with the rain and the melting snow from the hills. The equally numerous one-way bridges, which replaced those demolished, again caused congestion and delays. Unmetalled roads crumbled. But the army was determined not to be static. The Trigno and Sangro were crossed. The difficulties encountered in getting casualties back across the swollen stream of the latter, before bridges were firmly established, were overcome by manhandling, by amphibious "ducks," and by the devotion of field ambulance orderlies. And so on to St. Vito and Ortona. Every advantage had to be taken to place mobile units well forward; a scorched-earth policy had left few buildings for casualty clearing stations, and it was bad country for tents. But the obvious and the unforeseeable delays on the roads proved the greatest indication for surgical units close up.

#### The West Italy Campaign

The landing at Salerno and the subsequent campaign on the west coast were not Eighth Army business. But the American Fifth Army, whose campaign it was, had a substantial British component, the medical units of which had all seen previous service with the Eighth and First Armies. Later there was to be a further mingling. Unofficially at first, officially later, I was able to observe the surgical aspect of this campaign, and it

would be a pity not to include briefly the contrasting picture. As will be remembered, the landing was a hotly contested affair. For some days the invasion force was restricted to an area in which medical units and their patients had to share whatever was hurtling around. Field surgical units came early with beach parties, and casualty clearing stations followed in the next few days. Digging down and sand-bagging were required to an extent not needed previously. While patients were received very promptly after

wounding there was the drawback of their post-operative care in tents. A canvas roof was not convincing protection from bomb, shell, or, more likely, large splinters from anti-aircraft fire, and the racket that went on from the latter alone was hardly rest-giving. The natural outcome was a rather more expeditious transfer to hospital ships than would have been considered advisable under less harassing conditions.

Soon, however, the advance progressed, and eventually Naples was taken. This allowed of general hospitals in buildings; but here again, as at Tripoli, they could at first be little more than final staging posts to the ships, though able to retain patients on the danger list. The specialties were soon installed—chest, facio-maxillary, and neurosurgical. With the forward casualty clearing stations only some three or four hours away, there was no need for the specialties to move from the hospitals.

There were few suitable buildings near the line, and most casualty clearing stations went under canvas as the line moved forward. This was pleasant until the weather broke. Then the scene changed, and duckboards and other squelchy reminders of Flanders in the last war reappeared. It was in keeping with the relatively static nature of the fighting. But there was slow but sure nibbling going on ahead, and surgery was keeping up by means of smaller advanced centres, one of which consisted of as much as the light section of a casualty clearing station with three additional field surgical units. Such could be accom-



modated in the only suitable building available at the time of the early Garigliano fighting. Elsewhere the field surgical units were working in pairs. The wounds at this time were very commonly multiple and severe from mortar fire.

The conditions on the two sides of Italy were now almost identical.

### Some Other Features

Some other features of the campaigns may be given to fill in the picture.

The mine-fields of Alamein were largely meant to hinder tanks and vehicles. By the time Benghazi was reached, the anti-personnel mine, chiefly exemplified by what is known as the S mine, had made its appearance in numbers soon to become profuse. Roughly the size of a 2-lb. jam-jar and actuated by the tread of a foot, this infernal machine after a few seconds' delay springs five or six feet into the air and explodes, to scatter some 300-odd ball-bearing-like metal marbles with a high initial velocity. As the enemy retreated he planted more and more of these, not only in protective fields where he was making a stand but everywhere that his pursuer might walk—on the road verges and off the roads at points where transport might pull in for the night. The multiple wounds frequently caused by these mines were later to be excelled in severity by the multiple wounds of the several-barrelled mortars which were so fully exploited by the enemy. Such multiple wounds cause great anxiety to the surgeon. Not only is shock pronounced, but one or more of the wounds is often a serious one—a fractured femur or a penetrating abdominal injury. By the time the surgeon has dealt with this he has to face a dilemma of how much more the patient will withstand.

While wounds from anti-personnel mines became for a time more numerous, those from anti-vehicle mines became fewer. The latter frequently took the form of severe compound injuries of the feet, from the underneath explosion. The harassed enemy, fortunately, had less time to plant so many of these later, and more efficient mine-detecting apparatus largely abolished a type of wound which led almost inevitably to amputation.

The army had moved off from el Alamein in shirts and shorts in October, 1942. It changed to battle dress for the winter in the desert, and was back in drill for the end of the African battle, the Sicilian adventure, and the early part of the Italian campaign. Retained clothing around missiles—a potent source of trouble—was never the feature in the dry desert, even with battle dress, that it became in the wet and mud of Italy.

While at el Alamein each forward casualty clearing station could only have one reinforcing team, by the time Italy was reached the number of field surgical units had been so increased as to allow of several at important points. The tenor of the working day was thus much evened, and efficiency rose. An experiment made in the intervening period, with the object of increasing the forward surgical potential during rush periods, is worthy of note. What were called reserve surgical teams were formed. They were drawn from base general hospitals, they consisted of personnel only, and they were meant to relieve, or spell with, a regular team, using the latter's equipment. The emergency over, they returned to their hospitals for the busier period at the base. A relief surgeon by himself is little use; a whole team is needed.

### SURGICAL UNITS IN THE FIELD

The tactical disposition of units is the administrator's business. He sees the whole picture—the present one and the likely future; he is in touch with the other Services. In these campaigns, as may be imagined, he required breadth of mind and resource in changing situations. A rough idea of the principle behind the dispositions has been given above. How did surgery best fit into this?

The casualty clearing station is the key unit of field surgery. Reinforced by field surgical units, it can have several operating teams to take their spells of duty and remain fresh. It offers, because of the sisters on its establishment, a high standard of nursing. It has ample beds for serious casualties. It has good lighting, x rays, and suitable tents. It offers some refinements in the way of invalid food and hospital comforts. It can usually be sited clear of noise. Its position is generally assured for some weeks. Thus every wounded man who can with little

risk be passed back to a casualty clearing station, after first aid and resuscitation, will receive the best attention possible in the field.

For the desirable early treatment of wounds, therefore, the foremost casualty clearing stations were sited as far forward as possible, consistent with their retaining these attributes and with their conforming to the demands of the military situation, geographical and tactical. The latter, which might be handicapping to the ideal, had to be accepted. The lightly or moderately severely wounded could reach them without deleterious effect. But it was not always so with the serious casualty. The time factor and the strain factor came into play. These will be referred to when discussing evacuation of casualties.

The wounded who, after first aid from their regimental medical officer and supplementary attention with perhaps plasma transfusion at the advanced dressing stations of field ambulances, reached the main dressing stations of the latter were sorted into three groups. The first were those requiring resuscitation, the second those requiring operation as an urgent measure; the third group comprised all others. The first group naturally included many of the second. Resuscitation of course means more than transfusion of plasma or blood. It entails rest, warmth, and lying in reasonable comfort.

Surgery was taken to the second group by the field surgical units or by the light sections of casualty clearing stations. The needs of many of this group demanded it. Urgent need of operation, however, embraces two shades of meaning. It implies an imperativeness, and it may or may not imply very immediate performance. Some patients—for instance, with abdominal injuries—were little shocked and not bleeding, and could go on a further two or three hours to the casualty clearing station.

To the light sections of casualty clearing stations operative work at this level presented little difficulty. They had beds suitable tents, and highly trained orderlies. They had often worked as unchanged teams. There were, however, not enough of these light sections, and separation from their main body impaired the effectiveness of the latter in no small way. Accordingly most of the surgery at this level fell to the lot of the mobile surgical teams. Their difficulties were greater, and it was interesting and gratifying to observe, as the months passed, how by the labour and ingenuity of both field ambulances and themselves the drawbacks were gradually overcome and a level close to casualty clearing station standard was attained. To the field ambulances the field surgical units owe much in their development. The former liked to have the latter attached. It meant that for the time they were more than a staging post, that they were provided with material of great clinical interest, and that their nursing orderlies received valuable education.

The early Middle East field surgical teams, the prototypes, did not carry beds. Nor do field ambulances. A stretcher is hardly the ideal resting-place for a post-operative abdominal or dyspnoeic chest patient. Many successful efforts were made in devising back-rests to fit these. Gradually, however, a few beds were "acquired" by most units and carried forwards. (The later field surgical units, instituted by the War Office, were to be given twenty beds and bedding, and another lorry for their conveyance.)

The accommodation provided by the field ambulances was mainly in the form of collapsible shelters suspended and carried out from the sides and backs of lorries on to goal-post-like steel frames. Weatherproof as these were, they were rather a cheerless, gloomy environment for those too ill to be passed on. Gradually again from the desert, in some mysterious fashion, the field ambulances acquired the trim white windowed tents known as E.P.I.Ps.

Beds and tents, so far so good. Nursing was another problem. There were no sisters at this level. The field ambulance orderly had not had the opportunities of his casualty clearing station colleague. The latter got much continuous practice. Only on occasion would a field ambulance have a surgical unit attached. The surgeon of the latter guided and helped the orderlies, but he would often be long periods in the theatre, and there were gastric suction and transfusion drip apparatus to be watched, deterioration in patients to be observed, bleeding to be detected, let alone the other multi-

farious calls of nursing. The sisters and doctors of the R.A.M.C. get much praise; the rank and file get less than their due. These orderlies were keen and industrious, and many reached high levels of intelligence and proficiency. But it stood to reason that with only occasional experience they would not achieve the standard of nursing of a casualty clearing station.

It was thus becoming evident before the end of the desert campaign that to overcome these drawbacks any advanced operating centre forward of a casualty clearing station would be best constituted by two surgical units and a transfusion unit, attached to a main dressing station. (The new system of field dressing stations was not yet here in operation.) The transfusion unit took much of the worry off the surgeons, not only by saving their time but by its officer supervising the pre-operative ward, and, in conference with the surgeon, deciding priorities. The presence of a second surgical unit meant a more regular spell of duty for each surgeon and the opportunity of more careful post-operative supervision. A further development which took place later in Italy was the institution of a pool of experienced nursing orderlies at the Corps field ambulance. These had all been a year or more with casualty clearing stations and could now be called upon by these forward detached surgical centres. The arrival of fresh field ambulances had made this desirable, since their orderlies were as yet little experienced in this type of nursing. (On occasions, when suitable accommodation was available, sisters went forward to this level.

None the less, it can be imagined that the casualty clearing station was still the better place if the wounded men could be got there safely.

Another disadvantage of the solitary forward team needs mention. The field ambulance and its team sometimes had to be up and doing before the patients it harboured were fit to be moved. Occasionally another unit such as a casualty clearing station took over the site and the patients. Otherwise a party had to be left behind to nurse them. The surgeon could not always look back. Complications might arise and no theatre was available. The ordinary arrangements, however much care was taken, were relatively primitive and cheerless. The casualty clearing stations, on the other hand, were relatively static, and by the time they had been leap-frogged several times their patients were fit to move.

The detached field surgical units did work which caught the imagination. To the other Services, laymen in these matters, the idea of a mobile surgeon who could operate upon a casualty almost at once was in military slang "just the job." The operation itself hypnotizes the layman to the exclusion of other necessary but less publicized considerations. There developed almost inevitably a tendency to try to exploit these mobile units beyond what was wise. In their laudable anxiety to help the fighting troops to the utmost, even medical minds, though not of those in the highest positions, became a little imbued with the same tendency. It is not a good thing to move these teams over-frequently, for the reasons given above. Again, it is not wise to have advanced operating centres too far forward, within ordinary range of the enemy's guns or in close proximity to the noise and tremor of our own. A mile or two can make much odds. For it is the most serious cases which are to be treated, and they have not only to be operated upon but to be held several days. It is a terrifying thing for bed-bound patients in a tent to be shelled or bombed. Weak though they may be, not all will remain bed-bound, and indwelling drip and suction tubes soon become outdwelling as the casualty takes to earth. Apart from this, the surgeon must have reasonable quiet and rest if he is to do good work. There occurred necessary and advantageous exceptions to the rule. In the early stages of invasions work had to be done within range of fire. Again, if an odd shell kept dropping into a town or village where a suitable building for a unit was available, not too much was thought of that.

#### The Specialized Units

The development of forward specialized work is one of the most interesting items in the surgical history of the campaigns. The need for mobile ophthalmic units in forward areas had long been recognized and met, and the tale of eyesight saved by this wise provision will no doubt in time be told. The other

surgical specialized units of the army are devoted to chest, maxillo-facial, neurosurgical, and orthopaedic work. Since orthopaedics in the field is essentially concerned with compound fractures, all forward surgeons must be orthopaedists up to a point. The place for the special orthopaedic teams is at a site where patients can be held for a period up to two or three months so that skeletal-traction appliances and the like need not be disturbed by premature evacuation. Their place, then, is at the base hospitals—better still, at an advanced base when such holding is possible. It usually needs time before an advanced base hospital is in a position to hold other than danger-list and some other special types of case not requiring more than four or six weeks' retention at this stage.

To provide early skilled treatment a few mobile neurosurgical units had been formed at home early in the war. At the time of el Alamein there was one of these in the Middle East. To provide the widest service it was located in Cairo. Patients could be sent there fairly quickly from the army's jumping-off point, and, with the aid of air transport, for some time in the early advance. About two months later, when the army had advanced some 800 miles, a second unit arrived and was sent forward, to be attached at first to a casualty clearing station on the lines of communication. Later, when the battle had swept well beyond Tripoli, it arrived during the formation of that advanced base. Delays of evacuation were proving a problem, so the unit was split. The advance party went to the foremost casualty clearing station which drained the line; the rear section stayed at a hospital in Tripoli. There they received the operated-upon patients, most of whom travel well, and retained the serious cases in optimum circumstances, the others going on to the Delta by air or sea. This arrangement of the split team held admirably right up into Italy, although administrative troubles supplied a hitch or two. Its success in the desert has been related. Even greater scope was forthcoming from the heavy fighting on the Trigno and Sangro in Italy in the closing weeks of 1943.

A maxillo-facial team was dispatched to Tripoli at the time the advanced base was set up, and remained there till the end of the Tunisian campaign. When Sicily was invaded, it was decided to split this team also so that severe cases there should have prompt attention and yet there would remain a section at a general hospital. The advanced section was eventually pushed forward experimentally to the same level as the ophthalmic and neurosurgical. The three, "the unholy trinity" as they were known, thereafter were kept together. They were located always at the most forward casualty clearing station which drained the whole line. This, because of the more usual narrow front, was often the foremost. The vast majority of the special casualties thus passed through the sections of these teams at an early period after wounding. By such siting the general surgeons were relieved of much worry, and the argument of how much they should or should not do was largely dispensed with. They were quite willing, indeed eager, to pass on these patients to more-trained teams so long as the latter were at hand. Previous advice, to clean up such wounds and send the patients back to an advanced base for special treatment, was unsatisfactory. Once a general surgeon, untrained in a specialty, embarks on such a cleansing he tends to do too little or too much.

The exigencies and variations of war, however, are unlikely always to allow such ready facilities, particularly if special teams are few. As circumstances permit it would seem wise to train general surgeons in the elementary technical procedures admittedly necessary. Otherwise it is unjust of specialists to deride the general surgeon's results, as is so frequently done. This is as unfair as the proposition, equally often asserted, that the specialist can do all the general surgeon's work competently.

The chief justification for an advanced maxillo-facial team was for the fractured-jaw patient to have uniform early and adequate fixation—the dental surgeon's business. Splitting of the team as it was done sent forward also a surgeon with plastic training. This was still more experimental and of doubtful value. But the surgeon concerned, admittedly at first somewhat sceptical, was in a few months able to report that he had found plenty to do. His work included submandibular

drainages, removal of foreign bodies, closure of deep layers of cheek wounds, the accurate suture of lips, the immediate replacement of displaced fractured nasal bones, zygomatic bones, and orbital margins, and the repair of torn eyelids. In many instances the patients with these injuries could not have reached an advanced base hospital till three days later.

It needs little imagination to appreciate the value of the trinity at this level, not only singly but in conjunction on the same patient.

As field ambulances had fostered field surgical units, so likewise casualty clearing stations fostered the trinity. There were sometimes difficulties of accommodation in one casualty clearing station for the extra theatres and personnel. The drawbacks were always overcome and the trinity remained undivided. It is doubtful, however, if the specialties could have worked so closely together had their teams not been split. The trinity would then have been too cumbersome for any of the foremost casualty clearing stations to accommodate in addition to the general teams.

The chest specialty was not made so advanced, although, had there been a sufficiency of chest teams, the experiment of placing a team at the same level as the trinity might have been tried. The policy with only one team "in the field," as distinct from the base, was to place the field unit with a suitable advanced general hospital. Theoretically it was at a site where it could hold patients for six weeks. In practice it could not hold them all because of the other heavy demands upon such a hospital. But it could hold the serious ones. Haemothorax and its possible infection constitute the most important complications of chest wounds. Removal of foreign bodies and the treatment of complications are better performed, if possible, with the greater facilities of a general hospital in the matters of x rays, theatres, laboratories, and nursing. What the field surgeon contributed to the chest specialty was the closing of sucking wounds, débridement of others, and aspiration of haemothoraces after 48 hours. Only occasionally was anything more indicated.

(To be concluded)

## SENSITIVITY TO LIVER EXTRACT

BY

J. G. MCSORLEY, M.B., B.Ch., B.A.O.

AND

L. S. P. DAVIDSON, B.A., M.D., F.R.C.P.

(From the Department of Medicine, University of Edinburgh)

The purpose of this communication is to stress the not uncommon occurrence of allergic reactions to intramuscular liver therapy, their alarming nature on occasion, and the practicability of desensitization.

Since Schlesinger (1930) first drew attention to the occurrence of reactions to liver therapy we have been able to find in the literature records of less than a hundred cases of allergic reactions to oral, intravenous, and intramuscular liver therapy. When the widespread use of liver extracts throughout the world is considered, such a small number of reported cases would appear to indicate that allergic reactions to liver extracts are rare. Delikat (1943) had 14 cases of sensitivity to liver therapy among 200 cases of pernicious anaemia, and records in detail three severe cases. Of 60 consecutive cases of pernicious anaemia admitted to our wards during the past five years, four (6.6%) have subsequently developed reactions after one to three years of maintenance therapy. Barfred (1942) reports 19 cases showing allergic reactions among a total of 49 treated with intramuscular liver extracts—an incidence of approximately 40%. It should be pointed out, however, that Barfred was using experimental extracts which were often neither purified nor concentrated, and hence were given in large amounts (5 to 10 c.cm.).

We have been able to find only two papers in the British literature devoted to the subject of allergic reactions to liver therapy. Andrews (1941) records one case and Delikat (1943) three cases in detail. The most significant British reference is contained in a letter to the *British Medical Journal* by Morgans (1943)—a few weeks after Delikat's article—record-

ing the only fatality ever published from a reaction to an intramuscular injection of liver extract. In 1936 Ungley, Davidson, and Wayne, in an investigation of the clinical efficacy of the original Dakin and West preparation (anahaemin), mentioned that reactions to intravenous therapy occurred in two cases.

Reactions to liver extract may be classified as primary—i.e. those occurring after the first liver injection; and secondary—i.e., those which appear for the first time after weeks, months or years of parenteral therapy.

Primary reactions are not due to acquired sensitivity, but are an immediate response of the body to the parenteral injection of foreign material. Such reactions were much more common when liver extracts were given by the intravenous route (Castle and Taylor, 1931; Murphy, 1932). The use of the intramuscular route and the purification and concentration of liver extracts have resulted almost in their complete disappearance. Disagreeable effects reported include pyrexia, collapse, shivering, vertigo, flushing, headache, and dyspnoea (Strauss and Castle, 1932; Schlumm, 1932; Strandell and Hammar, 1932).

Secondary reactions to oral, intravenous, and intramuscular liver therapy have been described. They are undoubtedly of an allergic nature. In support of this contention are the eosinophilia, the latent period between the primary injection and the onset of symptoms, the clinical features, including bronchospasm and the characteristic skin reactions, and the response to adrenaline. Sensitivity can be passively transferred to a normal individual from the sensitive individual by the Prausnitz-Küstner technique (Grün, 1934; Lasch, 1936; Crieep, 1938; Pache, 1939; Jones, 1939; and ourselves in 2 cases). The sensitivity has been shown to be specific to the organ from which the extract has been prepared rather than for the species of animal concerned (Crieep, 1938; Pache, 1939; Jones, 1939; Scarlett and Macnab, 1942).

During the past ten years one of us has had referred to him approximately 40 patients with reactions to parenteral liver therapy, 21 of whom have been investigated during the last two years. Of these cases 15 were so severe that they were admitted to hospital for investigation and desensitization.

A study of the literature shows that sensitivity has occurred to all the leading brands of liver extract. On the continent of Europe, campolon in Germany and pernaemon in the Netherlands appear to be often incriminated, while in America reticulogen and Lederle extracts are those chiefly mentioned. In our experience anahaemin and campolon are the commonest offending extracts, but we have also had cases sensitive to other British extracts and to Continental and American products. The frequency with which reactions are reported to such highly purified extracts as reticulogen and anahaemin indicates clearly that the causation of the reactions does not correspond to the degree of purification and concentration, but rather to the chances of sensitivity occurring from extracts which enjoy the greatest popularity in the various countries.

When such sensitivity is established to a particular liver extract, injections of a different extract may be given in some cases without any reactions. Thus on occasion we have had patients sensitive to anahaemin, or campolon who tolerated reticulogen well. Such patients, however, tended to become sensitive to reticulogen in a period of weeks or months. In general, however, our experience suggests that if a patient shows marked reactions to one liver extract, sensitivity will extend to all liver extracts.

The reaction generally occurs within 5 to 30 minutes after injection. In many reported cases, and 9 out of 19 of our cases investigated during the past two years, there have been periods of interruption of therapy lasting in some instances for several months, with the reactions appearing shortly after the resumption of treatment but not after the first injection of the new course of treatment. Another important feature is that once the reactions have appeared they usually increase in severity after successive injections.

### Types of Reaction

A study of the literature reveals that almost every type of allergic reaction has been observed in cases sensitive to liver therapy. The commonest reactions, in our experience, are



flushing, tachycardia, erythema, and localized urticaria. Reactions vary much in severity, from the mild features mentioned above to generalized urticaria, severe bronchospasm, vomiting, rigor, hyperpyrexia, severe nasal and ocular discharges, substernal pain, collapse, and angioneurotic oedema. One or more of these manifestations were present in each of our cases. Allergic manifestations not observed by us but reported by other workers include swelling of the lymph nodes, hemiplegia (Kaufman *et al.*, 1943), and repeated uterine haemorrhages (Gardner, 1938).<sup>\*</sup> Sensitivity may reach such an extreme degree that even the injection of 0.1 c.cm. of liver extract given intradermally for the purpose of making a skin test has brought about severe flushing, bronchospasm, and tachycardia in one of our cases.

#### Skin Tests

Opinion regarding the value of skin tests for assessing the presence and degree of sensitivity in allergic diseases is sharply divided. No less an authority than Raekemann (1943), in a paper dealing with the problems of allergy, concludes that "skin tests have lost some of their glamour." It is well recognized that a patient may give a positive skin reaction to pollen or to tuberculin and yet not be suffering from hay-fever or active tuberculosis. Similarly, patients who have been receiving liver extract are not infrequently positive to a skin test and yet show no reactions to parenteral liver therapy. This was found by us in 16 of 52 cases of pernicious anaemia. Conversely, it is known that skin tests may be negative in allergic conditions, and yet severe allergic reactions may occur to parenteral injection of the specific allergen. Thus Bullowa (1937) reported 8 fatal cases of anaphylaxis to antipneumococcal serum, in all of which previous skin tests for sensitivity were negative. In two of our cases with extremely severe allergic reactions skin tests were negative, later becoming positive in one case when urticaria developed as an additional feature to bronchospasm. Despite these limitations, our experience suggests that it is worth while doing skin tests, since we have found in the majority of cases that the degree of the skin reaction bears some relation to the severity of general sensitization and the reactions which result. Moreover, if general reactions follow the skin test it may be concluded that the patient is extremely sensitive.

#### Technique of Skin Tests

We inject intradermally 0.05 c.cm. of undiluted liver extract into the volar surface of the forearm just below the crease of the elbow-joint, with a saline control at the same level. We accept as a positive reaction a wheal of 15 mm. or more, developing in 15 to 30 minutes. Pseudopodial extensions from the wheal occur in practically all patients who are very sensitive. The size of the surrounding red areola is of little significance. Pache (1939) reported positive intradermal reactions to liver extract in a dilution of 1 in 1,000,000. As severe generalized reactions may occur to the skin-test dose of 0.05 c.cm., adrenaline should always be at hand in case of emergency.

#### Treatment

We have arbitrarily divided sensitive patients into two classes for treatment: (1) those with mild symptoms, and (2) those with severe constitutional reactions. It is permissible in mild cases to attempt to control the reactions by injecting three minims of 1 in 1,000 adrenaline hydrochloride concurrently with the liver preparation. In some cases this may be sufficient without any alterations or additions to treatment. In other cases satisfactory results may be obtained by reducing the quantity injected to one-half or one-quarter of the dose which produced a reaction and decreasing the periods between injections by a quarter or a half. Adrenaline may be given at the same time. After a few weeks on this treatment the dosage and the intervals between injections can be gradually increased to the desired maintenance levels.

The following measures have been recommended as adjuvants for the reduction of sensitivity, but proof of their value is wanting: (1) calcium orally and parenterally (Lasch, 1936; Gigante, 1939); (2) injections of parathyroid to raise the blood calcium (Lasch, 1936); (3) histamine in gradually increasing

doses to produce histamine refractoriness (Corelli, 1935); (4) histaminase, a supposed inactivator of histamine (Taylor and Hilger, 1941). The latter workers claimed that histaminase, given orally, not only prevented reactions but also reduced or abolished positive skin sensitivity, precipitin reactions, and passive transference of sensitivity. When the histaminase was discontinued, reactions and positive sensitivity to skin tests recurred. We have been unable to obtain histaminase to test the accuracy of these claims. It should be noted that Raekemann (1943), in a discussion of the value of histaminase in preventing allergic manifestations in general, states that its efficacy is doubtful.

Barfred (1942) claimed that the preparation of liver extract with butyl alcohol removed a considerable part of the factor causing allergic reactions. Accordingly we asked British Drug Houses Ltd. to supply us with a sample of anahaemin which had been extracted with butyl alcohol. The material was tested on two cases sensitive to anahaemin, and, in both, reactions occurred of a degree and a type similar to those produced by the standard anahaemin. In addition, when the butyl alcohol was evaporated and the residue dissolved in water its intradermal injection failed to give positive skin reactions in the two cases referred to above. Accordingly we are unable to confirm Barfred's claims.

#### Severe Cases

Patients who are suffering from dangerous allergic reactions must either replace parenteral liver therapy by oral ingestion of whole liver, liver extract, or hog-stomach preparations, or submit to desensitization. Desensitization has been recommended and carried out by Grün (1934), Krantz (1938), and Delikat (1943). Increasing doses of the liver extract were given subcutaneously or intramuscularly at intervals of days or weeks. The method which we have found satisfactory in 17 severe cases, including two desensitized by Dr L. J. Davis, Lecturer in the Department of Medicine, is as follows:

The degree of sensitivity is assessed by the history of the severity of the generalized reactions and by the response of the skin and the patient to an intradermal test of 0.05 c.cm. of the liver extract to be used. If any generalized reaction occurs to this test, desensitization should be started with a smaller quantity of liver extract, such as 0.01 c.cm. In the great majority of cases 0.05 c.cm. was found to be a suitable initial dose. With the initial and all subsequent injections, 0.2 c.cm. of adrenaline hydrochloride (1 in 1,000) is given. The dose of liver extract is doubled every half-hour and the route of the injection is changed from the intradermal to the subcutaneous when the 0.4-c.cm. dose of extract has been reached, and to the intramuscular route at the 1-c.cm. dose. It is our experience that if a reaction is going to occur during desensitization it generally follows the 1-c.cm. dose. In this event the same dose is repeated in half an hour, and if no reaction occurs the dose is increased to 1.5 c.cm. and finally to 2 c.cm. of extract at half-hourly intervals. In the majority of cases desensitization is secured in three to five hours. Thereafter it is advisable to repeat the final dose (2 c.cm.) daily for three days without the addition of adrenaline. Weekly doses of 2 c.cm. are now given for six weeks, and finally maintenance therapy is continued by a single injection once every two, three, or four weeks. We advocate the daily and weekly injections mentioned above because we have found that there is a tendency for sensitivity to recur if the interval between the initial course of desensitization and the next injection is delayed for two weeks or longer. Although Kaufman *et al.* (1943) advise that the intervals between injections for maintenance treatment should not exceed one week, since otherwise sensitivity will recur, this has not been our experience, as we have at the present time 14 patients who have been desensitized and who have maintained a normal blood level for one to two years without a recurrence of sensitivity on an intramuscular injection of 2 c.cm. of anahaemin monthly. Attention has already been drawn to the frequency with which a history was obtained of sensitization occurring subsequent to breaks in the continuity of treatment. Accordingly it is essential that intervals between injections should on no account exceed four weeks.

#### Conclusion

We would advocate desensitization for patients allergic to liver extract rather than the alteration of treatment to the oral ingestion of liver or hog-stomach preparations, since it is generally agreed that parenteral therapy is cheaper and more effective than oral therapy. Desensitization is, however, a potentially dangerous procedure unless carried out under strict supervision by someone experienced in the danger of anaphy-

<sup>\*</sup> Since the preparation of this paper a case showing uterine bleeding as a manifestation of allergy to liver extracts has come under our care.



active reactions. This danger is greatly increased if the patient is seriously debilitated or is suffering from cardiovascular disease. A potent solution of adrenaline hydrochloride and a sterile syringe must always be at hand; and 0.5 c.cm. should be given immediately any signs of an allergic reaction occur.

### Summary

The nature and frequency of reactions to parenteral liver therapy and the significance and technique of skin tests for sensitivity are discussed.

The successful desensitization of 15 cases with severe reactions is reported, with a description of the method employed.

We wish to express our thanks to those of our colleagues on the staff of the Royal Infirmary, Edinburgh, who have permitted us to investigate cases of sensitivity under their charge. One of us (J. G. M.) was in receipt of a Bursary in Medicine from the National University of Ireland during part of this investigation.

### REFERENCES

- Andrews, C. T. (1941). *Lancet*, 1, 664.  
 Barfred, A. (1942). *Acta med. scand. Supp.*, 131.  
 Bullowa, J. G. M. (1937). *Management of the Pneumonias*, p. 315, Oxford University Press, London.  
 Castle, W. B., and Taylor, F. H. (1931). *J. Amer. med. Ass.*, 96, 1198.  
 Corelli, F. (1935). *Forze Sanitarie* (Aug.). (Cited by Barfred, 1942, loc. cit.)  
 Cripp, L. H. (1938). *J. Amer. med. Ass.*, 110, 506.  
 Delikat, E. (1943). *British Medical Journal*, 1, 539.  
 Gardner, J. W. (1938). *J. Amer. med. Ass.*, 110, 2003.  
 Gigante, D. (1939). *Minerva med.*, 30, 582.  
 Grün, G. (1934). *Wien. klin. Wschr.*, 47, 751.  
 Jones, C. A. (1939). *Int. Clin.*, 3, 258.  
 Kaufman, R. E., et al. (1943). *Ann. intern. Med.*, 19, 768.  
 Grantz, C. I. (1938). *J. Amer. med. Ass.*, 110, 802.  
 Lasch, F. (1936). *Wien. med. Wschr.*, 86, 126.  
 Morgans, C. C. (1943). *British Medical Journal*, 1, 613.  
 Murphy, W. P. (1932). *J. Amer. med. Ass.*, 98, 1051.  
 Pache, H. D. (1939). *Dtsch. med. Wschr.*, 65, 1192.  
 Rackemann, F. M. (1943). *Arch. intern. Med.*, 71, 107.  
 Scarlett, E. P., and Macnab, D. S. (1942). *Canad. med. Ass. J.*, 46, 578.  
 Schlesinger, W. (1930). *Wien. med. Wschr.*, 80, 696.  
 Schlumm, F. (1932). *Klin. Wschr.*, 11, 975.  
 Strandell, B., and Hammar, E. (1932). *Acta med. scand.*, 77, 345.  
 Strauss, M. B., and Castle, W. B. (1932). *J. Amer. med. Ass.*, 98, 1620.  
 Taylor, C. B., and Hütter, D. W. (1941). *Ibid.*, 117, 1880.  
 Ungley, C. C., et al. (1936). *Lancet*, 1, 349.

## EXPERIMENTAL TRAUMATIC SHOCK

BY

J. CHARNLEY, M.B., F.R.C.S.

Major, R.A.M.C.

The aetiology of traumatic shock still eludes final proof. All are agreed that a reduction of blood volume underlies the state of shock, but the mechanism whereby this reduction occurs is still obscure.

Traumatic shock has been investigated by clinicians and experimentalists, and many important facts have been established. There is, however, a fatal tendency to mix indiscriminately the facts of clinical shock with the facts of experimental shock, and a tendency to mix deductions from one type of experimental shock with shock produced by quite unrelated means. As a result of loose inference the problem of shock is to-day more difficult than it has ever been, and as much time must be spent in "debunking" the literature as in tackling the facts of the problem itself. Before the gaps between the various aspects and manifestations of shock can be bridged by a single theory the truth of each aspect must be firmly established. It is the purpose of this paper to concentrate exclusively on experimental traumatic shock produced by mechanical trauma to a limb.

Despite the fact that experimental traumatic shock might be considered a threadbare field for research, there is no unanimous answer to the question, "Why does an animal under anaesthesia pass into shock when severe mechanical trauma is applied to the limb muscles?" This problem is purposely kept within narrow and artificial limits. Until the complete answer is known it is fatal to make analogies with the causes of shock after burns, of surgical shock in the presence of superadded disease, or of the complex mixture of oligæmic, neurogenic, psychogenic, and metabolic factors which contribute to the state of shock in the wounded soldier.

An attempt is made here to present an old experiment in a new light, and to emphasize the need to regard this artificial

problem as one which should be capable of complete experimental proof; then, and then only, can it be viewed in relation to the problem of shock in general.

### The History of Traumatic Shock

Traumatic shock first aroused interest during the war of 1914-18 by the fact that it often supervened some time after the patient was wounded and after a mysterious latent interval during which he appeared quite normal. It was the nature of this latent interval which focused attention on shock. It was this which gave rise to the clinical entities described as "primary" and "secondary" shock.

By what was no more than a remarkable coincidence physiologists, notably Dale and Laidlaw (1918) and Dale and Richards (1918), were interested at this time in the pharmacological reactions of the comparatively new substance histamine, which seemed likely to open up new vistas in physiology. In a hurried piece of research undertaken during the war, when a solution was urgently needed, Cannon and Bayliss (1919) appeared to establish as a fact that so-called "secondary" shock was due to the action of a tissue toxin akin to histamine.

About ten years later Blalock (1930, 1934) started to publish the results of further investigations on the Cannon-Bayliss experiment, undertaken with a degree of patience probably unequalled in the history of experimental surgery. He failed entirely to find any toxic cause for shock, and produced many reasons explaining the death of the Cannon-Bayliss animal as the result of local fluid loss at the site of trauma. But many of the forms of shock encountered in clinical practice—i.e., after surgical operations, after head injuries, burns, etc.—seemed so obviously unrelated to haemorrhage that there was a tendency to reject Blalock's theories even for the conditions of his own experiments. This refusal to believe led to a determination to find some other explanation with a dangerous over-elaboration of experimental technique.

As regards the toxæmic theory of shock few new facts have emerged. The capillary phenomena following toxæmia produced by the introduction of crushed muscle into the peritoneum have been extensively studied by Moon (1938) and his collaborators, though it is doubtful whether this bears any relation to the conditions of the original Cannon-Bayliss experiment. Practically all recent variations of this latter classical experiment—notably the dialysis experiment of O'Shaughnessy and Slome—have failed to reveal any toxic substance in the blood stream.

There remained only the nervous pathway for secondary shock, and O'Shaughnessy and Slome (1935) believed that they were able to demonstrate such a condition in the absence of blood loss and toxæmia. It is to be noted in this connexion that at the time when Cannon and Bayliss did their original experiment neurogenic factors were in the public mind one of the most likely causes of delayed shock. But these workers, and later Blalock in a more extensive research, were entirely satisfied that this very obvious source was not a cause of experimental traumatic shock. It was only after excluding this possibility that there was any justification for assuming a toxic theory of shock. The experiments of O'Shaughnessy and Slome were extremely elaborate, and there could be but little surprise that shock resulted.

Finally, clinical experience now casts doubt upon the existence of "secondary" shock as a clear-cut entity. Modern battle and air-raid casualties tend to be shocked progressively from the time of reception of the wound. It is the exception rather than the rule for a patient to appear initially quite fit and later to pass into a state of shock for no apparent reason. The disappearance of the mysterious latent interval removes the original condition for which toxic theories were first invoked. The latent interval seen in 1914-18 might have been due to exposure to wet and cold for many hours after wounding—a state of affairs not commonly seen in this war, but one often commented on in the Special Reports of the Medical Research Council of 1917-18.

Cannon and Bayliss (1919) established as a definite fact that shock did not result if the femoral artery and vein were ligated before applying trauma to the thigh. This fact has never been questioned since, and Blalock carried the experiment a little

further by showing that shock did not result even if the artery alone were tied, the vein being left patent. He explained this absence of shock on the grounds that the local blood loss was reduced by the ligature, and felt that there was here strong evidence against the toxic theory.

### The Present Experiment

It is my purpose to attempt to show that this simple experiment of femoral artery ligation is capable of a very much wider interpretation than has generally been ascribed to it. The research pursues the following scheme: (1) control series without ligation of the vessels; (2) effects of ligation of the femoral artery before trauma; (3) investigation of the collateral circulation after ligation.

#### Series 1

##### Trauma without Ligation of Vessels; 25 Cat Experiments

The anaesthetic was intravenous chloralose 0.09 g. per kg of body weight, after preliminary ether induction. All animals were kept at 39° C. on an electrically heated table and controlled by rectal thermometer. A kymographic record of carotid blood pressure was made, using saturated sodium bicarbonate solution in the cannula. Trauma was applied to the thigh with a 5-lb padded mallet, and a standard number of 50 blows were applied and the femur fractured in all cases. Shock level of blood pressure was taken as 70 mm. Hg. and was reached in times varying from 20 minutes to 6 hours after trauma. Shock did not develop in 3 of these cases even after 6 hours. It was invariably noticed that the crushed thigh was visibly and palpably swollen even before the end of the trauma was reached, and this speed of the initial swelling left absolutely no doubt that a brisk internal haemorrhage into the muscle planes was the immediate sequel to trauma under these conditions.

At the conclusion of the experiment the animal was killed, if it had not already succumbed to the shock, and the increase in weight of the traumatized limb was estimated as described by Blalock—i.e., the tail was removed, the trunk severed at the level of the lowest lumbar vertebra, and the pelvis sectioned through the midline. The weights of the two hind quarters thus separated could then be compared. Control attempts to divide untraumatized hind quarters showed that this manoeuvre could not be done with an error of less than 10 g., but even this inaccuracy did not invalidate general comparisons. The original blood volume of the animal was deduced from the figures quoted by Holt and MacDonald (1934) as being 5.75% of the body weight in the cat. The increase in limb weight was thus converted into percentage loss of total blood volume.

In these 25 experiments the proportion of the total blood volume lost into the traumatized thigh averaged 37%. This agreed closely with the 35% found by Holt and MacDonald in the same experiment.

#### Series 2

##### Trauma after Ligation of the Femoral Artery; 10 Cats

Anaesthesia as before. The carotid blood pressure was not recorded in this series until the conclusion of the experiment. The femoral artery was tied through a small incision in the groin. A similar amount of trauma was then applied to the thigh—i.e., 50 blows with the same mallet, and the femur fractured in all cases. The absence of rapid swelling of the thigh after trauma in these cases was very noticeable.

Clinical examination revealed no evidence of the onset of shock, and after 6 hours the carotid blood pressure was recorded by tying in a cannula and connecting to the kymograph. The pressures recorded after 6 hours were: 140, 120, 160, 95, 160, 100, 100, 90, 100, 100 mm. Hg. The three high pressures might have been due to the pressor effects of small additional doses of chloralose which had to be given in some cases towards the end of the experiment. In no case was shock level even approached. The average loss of total blood volume into the thigh in this series was 19%.

#### Series 3

##### Examination of Collateral Circulation after Ligation of Femoral Artery and Trauma to Limb; 4 Cats

(a) After 6 hours 4 of the preceding animals traumatized after ligation of the femoral artery showed the following carotid blood pressures: 120, 140, 100, 100 mm. Hg. A second arterial cannula was now taken and tied into the femoral artery distal to the previously applied ligature, and directed with its lumen open towards the foot. The cannula thus recorded the pressure of the anastomotic circulation existing in the femoral artery distal to the ligature. This arrangement is shown diagrammatically in the accompanying illustration. The pressures recorded in this second cannula were

respectively 40, 50, 40, 35 mm. Hg. These pressures are thus roughly one-third of the respective systemic arterial pressures. Such anastomotic pressures should be capable of maintaining a considerable anastomotic circulation through the limb.

(b) In the same 4 cats the great saphenous veins were exposed in both legs just below the knees. Into the normal limb an intravenous injection of 0.1 c.c.m. of a weak solution of histamine was given. The usual transient fall of arterial pressure was recorded on the kymographic tracing of the carotid blood pressure. This fall started 10 to 15 seconds after the injection was made. When the carotid blood pressure was restored to normal level 0.1 c.c.m. of a solution of histamine was injected at the same level into the saphenous vein on the traumatized side. It was found that the arterial depression resulted from 30 to 40 seconds after the injection. This volume of solution—0.1 c.c.m.—could not have reached the general circulation by virtue of its bulk, and must have been washed in by the venous return from the limb resulting from the anastomotic circulation. Ligation of the femoral artery delayed this return from about 15 seconds to about 40 seconds.

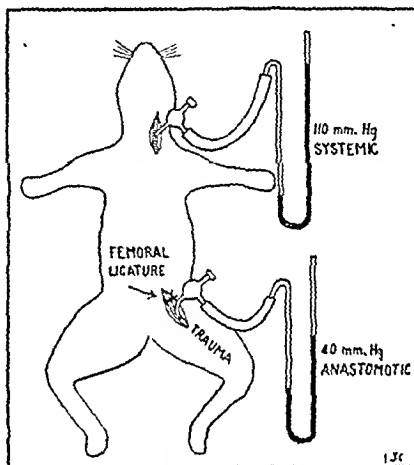


Diagram showing the method adopted in Series 3

### Discussion

In making deductions from this femoral ligation experiment, four factors deserve special attention:

1. That ligation of the femoral artery prevents the onset of shock on subsequent trauma to the limb.
2. That local blood loss is reduced from about 35% of the total blood volume to about 19%.
3. That rough qualitative tests indicate the existence of an active collateral circulation after trauma to the limb in the presence of the femoral ligation.
4. That the rate of swelling of the traumatized limb is much slower in the presence of a ligation on the femoral artery.

The absence of shock after trauma in the presence of a ligation on the femoral artery could be explained according to the current theories of shock in three ways, thus:

1. By the reduction of local fluid loss (oligaemic theory).
2. By a reduction of venous return from the limb (toxaemic theory).
3. By anaemia affecting sensory-nerve endings (neurogenic theory).

The crux of the femoral ligation experiment lies in the explanation of how the ligation can reduce the amount of local fluid loss and yet leave an effective collateral circulation. These two matters might at first sight appear incompatible; indeed, it could be argued that, though observations might indicate an active collateral circulation, the fact that local haemorrhage is reduced after the ligation must prove that these observations were fallacious.

There is, however, a simple explanation for this apparent paradox. When a limb is heavily traumatized without a ligation on the main artery the initial swelling of the limb proceeds at such a visible and palpable rate as to leave no doubt that a great part of this initial swelling is due to a rapid extravasation of blood under high arterial tension. Now, the

amount of arterial blood lost into the tissues during and immediately after the trauma depends on (a) the height of the arterial pressure in the ruptured vessel, and (b) the time elapsing before the haemostatic factors of arterial retraction and coagulation stem the initial extravasation.

After ligation of the main artery, and though the collateral circulation is quite effective for ordinary purposes of nutrition, etc., trauma to the limb results in extravasation of blood at only one-third of full arterial pressure (for this was the pressure discovered by direct measurement in the preceding experiments). During the time interval before haemostatic mechanisms come into action there is thus a smaller effusion of blood into the traumatized part. This, then, explains how the femoral ligature can reduce local blood loss after trauma without necessarily implying a defective collateral circulation through the limb.

As regards the toxæmic theory of shock, these observations agree with the deductions of Blalock—that shock does not result if all venous channels are open to the systemic circulation, provided that local blood loss into the limb is restricted.

These results are also consistent with those of all observers since the original Cannon-Bayliss experiment who have failed to find shock resulting from sensory-nerve stimulation under experimental conditions. How do these observations compare with those of O'Shaughnessy and Slome? It will be recalled that these workers severed all vascular connexions to the hind limb of an animal, A, and kept this limb alive by cross-circulation from a second animal, B. (It is interesting to note in parenthesis that to isolate this limb from the general circulation needed an extremely extensive multiple ligation of all collateral channels.) On traumatizing the perfused limb of animal A they were able to produce late shock in the systemic circulation of animal B. The limb was in connexion with the systemic circulation by only nervous channels. The nature of this shock must, however, be regarded with suspicion, as the necropsy appearances of the tissues which they describe are in no way consistent with their own excellent description of the typical appearances in traumatic shock. The great criticism of this elaborate experiment is that incidental trauma (which is extensive) is biased towards the production of the desired result—i.e., to produce shock. Compare this with the femoral ligature experiment, in which experimental factors are biased against the desired result—i.e., for a positive result the animal must *not* pass into shock during an experiment which is in itself very likely to result in shock. This is a very stringent experimental criterion.

In interpreting the results of the femoral ligature experiment it is possible to go a step further. There is always the theoretical possibility that traumatic shock might not be the result of only one factor, but of the combined action of several factors. Most experiments on traumatic shock have been ingeniously designed to study the action of only one factor at a time. In the experiment of femoral ligation described here all factors are capable of acting at one and the same time. Thus after losing 19% of its blood volume and being open to neurogenic and toxic shock channels, the blood pressure was still high after six hours.

### Conclusions

In the cat, under chloralose anaesthesia and for periods up to six hours after severe trauma to a limb, no evidence could be found for the existence of any shock-producing factors, or combination of factors, other than that of local fluid loss.

This work was done in the physiological laboratories of King's College, London, in 1939, through the kindness of Prof. R. J. S. McDowall, to whom I am deeply indebted. The costs of the research were defrayed by a grant from the Medical Research Council.

### BIBLIOGRAPHY

- Blalock, A. (1930). *Arch. Surg.*, Chicago, 20, 959.  
 — (1934). *Ibid.*, 29, 837.  
 Cannon, W. B., and Bayliss, W. M. (1919). *Med. Res. Cncl. Sp. Rep. Ser. No. 26*, London.  
 Dale, H. H., and Laidlaw, P. P. (1918). *J. Physiol.*, 52, 355.  
 — and Richards, A. N. (1918). *Ibid.*, 52, 110.  
 Holt, R. L., and MacDonald, A. D. (1934). *British Medical Journal*, 1, 1070.  
 — (1935). *Proc. roy. Soc. Med.*, 28, 1473.  
 Meon, V. H. (1938). *Shock and Related Capillary Phenomena*, New York.  
 O'Shaughnessy, L., and Slome, D. (1935). *Brit. J. Surg.*, 22, 589.

## DICOUMARIN IN THE TREATMENT OF PUERPERAL THROMBOSIS

BY

ALBERT DAVIS, M.D., Ch.M., F.R.C.S.

Consultant Obstetric Surgeon, London County Council

AND

MARGARET PORTER, B.Sc.

Biochemist, Dulwich Hospital (L.C.C.)

3:3-methylene-bis-(4-hydroxy-coumarin)—“dicoumarin”—is the anticoagulant principle of spoiled sweet clover, ingestion of which causes haemorrhagic disease in cattle. Since its introduction by Link in 1941 the drug has been employed experimentally in a variety of conditions, notably post-operative thrombosis, and the present paper embodies the results of an investigation into its possible value in obstetrics. In all, 43 cases of post-partum thrombosis were treated. They were of every degree of severity, from small saphenous lesions to bilateral femoral blockage; but, in view of their common origin, the general action of the drug, and the homogeneity of its results, they are here grouped together without further classification.

### Properties

Dicoumarin is a powerful anticoagulant, the action taking place at the prothrombin level. Given by mouth the drug takes approximately 24 hours to act, but with continued administration the result is a steady rise in the clotting time, the effect lasting for several days after the dicoumarin is discontinued. It greatly reduces the incidence and degree of thrombus formation after the intravenous injection of ethanolamine in dogs (Richard and Cortell, 1942), and is apparently similarly effective in preventing post-operative thrombophlebitis and pulmonary embolism in man (Baker, Allen, and Waugh, 1943). It also appears to limit the extension of an already established thrombosis and to produce symptomatic improvement in cases of thrombo-angiitis obliterans (Bingham *et al.*, 1943). Most observers state that although dicoumarin is an anti-prothrombin its effects are not antagonized by vitamin K. Our own results, however, show that when both preparations are administered simultaneously the coagulation-time curve rises more slowly and less steeply than when dicoumarin is given alone. This confirms Townshend and Mills's (1942) clinical observation that, while blood transfusion failed to produce any perceptible decrease in the prolonged prothrombin time of a case in which dicoumarin had induced haemorrhage, a second transfusion plus vitamin K therapy resulted in an immediate drop of the prothrombin and coagulation times to normal levels, and these normal values were maintained. It would indeed be surprising if this view of the antagonism of the two drugs were incorrect; for, theoretically, vitamin K is primarily concerned with the physiological elaboration of prothrombin in the liver. One must assume that its reported impotence in some cases of established dicoumarin haemorrhage is due to secondary changes produced by the anaemia.

Dicoumarin differs from heparin in method of administration, speed of initial response, and mode of action. The latter must be given by intravenous injection; but its action is instantaneous, the effect being produced by inhibition of platelet agglutination. Otherwise the clinical effects are similar, except that heparin haemorrhage reacts well to simple blood transfusion.

### Dosage

Experimental overdosage with dicoumarin in animals produces multiple haemorrhages. In fatal cases there is central necrosis of the liver (Rose, Harris, and Chen, 1942), with widespread haemorrhage indiscriminately throughout the body. There is a considerable difference in tolerance between various species of animals, and also among individuals of the same species. This latter is of much significance, for it applies equally to man, and calls for extreme care in therapeutic administration; in fact, few of the earlier clinical reports are without a description of one or more cases of idiosyncrasy. The optimum dose is that which will reduce prothrombin to 30% of normal (Davidson and MacDonald, 1943), and this has been calculated at 200–300 mg. a day. We have taken the

higher figure, given in three separate eight-hourly doses, and as there have been no untoward results in any of our cases this dosage may be taken as reasonably safe. Published results, however, show that the margin of safety is a narrow one, apart from the possibility of idiosyncrasy, and it is essential to control the treatment by daily estimation of the prothrombin, bleeding, or clotting time. The first is the most accurate, but in our cases of already established thrombosis we have found it adequate to rely on the other two. The curves obtained parallel control prothrombin-time curves almost exactly, and their calculation is consequently easier for routine ward work.

The blood reaction to dicoumarin given in the dosage suggested is variable, but as a rule there is an average daily rise in the coagulation time of one minute, beginning 24 hours or more after the first dose. This is independent of the initial normal clotting time, which itself varies in different patients and in the same patient at different times. The time increases more or less steadily for several days, after which it remains stationary or may even be reduced, in spite of the continued ingestion of dicoumarin. The effect persists for two or three days after the drug is stopped, and the coagulation rate is usually back to normal in a fortnight. We have, however, met two striking exceptions in which the clotting time remained considerably higher than the initial normal for several months. This suggests the need for extreme care in prescribing dicoumarin for patients who have been treated with it before.

### Results

The cases varied so widely in severity that it was impossible to find an exact parallel series for purposes of control, but comparison with the same number of untreated cases showed a marked improvement after dicoumarin. There were slight but definite amelioration of pain, a fairly rapid diminution of the oedema, and a shortened average stay in hospital—19 as against 28 days.

In addition the incidence of pulmonary embolism was lowered from 9 to 4%, and in only one case was this of any degree of severity. The drug was well tolerated, and there were no untoward complications and no suggestion of spontaneous haemorrhage in any of the cases.

### Conclusions

There is no doubt that dicoumarin is of value in the particular type of patient we have investigated, and in these cases of established thrombosis it would appear to be fairly safe. The freedom from haemorrhagic complications may be due to the normal increase in the coagulability of the blood during the puerperium; but whatever the factor concerned it is of significance, for ours is the only considerable series which does not contain at least one instance of dangerous bleeding, and that in spite of a fairly high dosage. But the fact that other observers have reported accidents of a serious nature so frequently in the treatment of similar conditions must necessarily modify final judgment, and there is no doubt that the drug needs extremely careful handling. We believe, however, that the results obtained justify its employment, always provided that the haematological effects are stringently controlled by daily prothrombin or coagulation-rate estimations by a skilled laboratory technician.

We are indebted to Messrs. Organon Ltd. for generous supplies of dicoumarin and to Dr. A. N. Macbeth and Mr. J. Foley for their interest and co-operation.

### REFERENCES

- Baker, N. W., Allen, E. V., and Waugh, J. M. (1943). *Proc. Mayo Clin.*, **18**, 102.  
Bingham, J. B., Meyer, O. O., and Howard, B. (1943). *Amer. J. med. Sci.*, **205**, 587.  
Davidson, C. S., and MacDonald, H. (1943). *Ibid.*, **205**, 24.  
Richard, R. L., and Correll, R. (1942). *Proc. Soc. exp. Biol.*, **N.Y.**, **50**, 237.  
Rose, C. L., Harris, P. N., and Chen, K. K. (1942). *Ibid.*, **50**, 228.  
Townsend, S. R., and Mills, E. S. (1942). *Canad. med. Ass. J.*, **4**, 214.

R. M. Dowdeswell (*E. Afr. med. J.*, 1943, **20**, 376) examined the Widal reaction in 183 cases of typhoid fever and came to the following conclusions: (1) The rise of titre from 1 in 50 to 1 in 1,000 occurred on an average in nine to ten days; (2) the agglutinins often do not appear until after the twelfth day and may be delayed until about the twentieth day; (3) the histories of the duration of illness before admission in most cases appear to give too short a period, so that those with the later rise in agglutinins are relatively more significant.

## EFFECT OF NICOTINIC ACID ON POST-OPERATIVE VOMITING

BY

WILLIAM W. MUSHIN, M.B., B.S., D.A.

AND

HELEN M. WOOD, M.B., Ch.B., B.Sc., D.A.

(From the Nuffield Department of Anaesthetics, Oxford)

The cause and prevention of post-anaesthetic nausea and vomiting are still as tantalizing and baffling a problem to us as they were to Hewitt (1893), whose words—"unfortunately our knowledge is very scanty, far scantier than it should be upon such a subject"—still apply to-day. We do know, however, some of the factors which are concerned in the production of this disagreeable feature of the recovery period. To mention but a few: a liability to vomit (e.g., travel sickness), the site of operation and the dexterity of the surgeon, the anaesthetic agent and how it is administered, and in some cases morphine, which cannot be excluded as a causal factor.

The nausea and vomiting which are a prominent feature of pellagra (Sydenstricker *et al.*, 1938), and that which occurs during sulphonamide (McGinty *et al.*, 1939) and radiation (Graham, 1939) therapy, are markedly relieved by nicotinic acid. A pilot experiment was planned to study the effect which this substance has on post-operative sickness.

Nicotinic acid is the precursor of the pellagra-preventing (P-P) factor of the vitamin B<sub>3</sub> group, and is the active biological group in the coenzymes I and II. It is concerned in the promotion of cell oxidation and the efficient metabolism of the cells of the gastro-intestinal tract. It has been shown that its administration increases the motility of the stomach and intestines (Crandall *et al.*, 1939).

The cases in this experiment were divided in rotation into the following three groups:—Group A: Pre-operative and post-operative—nicotinic acid 50 mg. two-hourly by mouth for two days before operation, and after operation as in Group B. Group B: Post-operative only—nicotinic acid 50 mg. two-hourly by mouth as soon as conscious, and this routine continued until nausea and vomiting ceased. Group C: Control group.

Premedication consisted of morphine gr. 1/6 and atropine gr. 1/100. The patients were anaesthetized as follows. A small dose of pentothal (0.2 to 0.3 g.) was given to produce unconsciousness, and this was followed by ethyl chloride, and then ether and air from an Oxford vaporizer. The anaesthetics were all administered by the same anaesthetist. In the recovery period morphine was given if the patient was in pain or was restless. The operations were routine hospital lists, and if any bias was shown in their selection it was in the direction of abdominal operations. None of the operations were emergencies.

It is difficult to assess the disability of a patient due to nausea or vomiting. We felt that, rough measure though it might seem, an accurate impression is conveyed in terms of bouts of vomiting.

TABLE I

	Nicotinic Acid	Total	Did not vomit	1 to 3 Bouts of Vomiting	Over 4 Bouts of Vomiting
Group A	Pre- and post-operative administration (750-900 mg. per patient)	29	10	11	8
Group B	Post-operative administration only (300-500 mg. per patient)	30	7	15	8
Group C	Control	30	6	15	9
	Totals	89	23	41	25

On the basis of these figures the  $\chi^2$  test shows the difference due to nicotinic acid to be statistically insignificant.

Table II is a rearrangement and simplification of Table I to show the difference between those to whom nicotinic acid was given and the control group.

The  $\chi^2$  test (with Yates's correction) shows no significant difference due to nicotinic acid. However, in those who had been given nicotinic acid there is a slight trend in the direction

of no vomiting at all, and, in those who did vomit, towards a reduction in incidence of post-operative vomiting.

TABLE II

Treatment	Did not Vomit Post-operatively	Vomited Post-operatively	Total
Nicotinic acid ..	17 (28.8%)	42 (71.2%)	59
Control ..	6 (20%)	24 (80%)	30
Total ..	23	66	89

### Summary

The effect of nicotinic acid on post-operative vomiting was studied in two groups of patients. In one group it was given both pre-operatively and post-operatively, and in the other as post-operative treatment alone.

The doses were 50 mg. two-hourly.

A control series was studied.

In all three groups as many factors as possible were kept constant.

No statistically significant effect on the incidence of post-operative vomiting was observed as a result of administering nicotinic acid.

We wish to thank Stuart Cowan, D.Sc., for his help and advice.

### REFERENCES

- Crandall, L. A., Chesley, E. F., Hansen, D., and Dunbar, J. (1939). *Proc. Soc. exp. Biol.*, N.Y., 41, 472.  
 Graham, J. Wallace (1939). *J. Amer. med. Ass.*, 113, 664.  
 Hewitt, F. W. (1893). *Anaesthetics and their Administration*, p. 329, London.  
 McGinty, A. P., Lewis, G. T., Holtzclaw, M. R. (1939). *Georgia med. Ass. J.*, 28, 54.  
 Sydenstricker, V. P., Schmidt, H. L., Fulton, M. C., New, J. S., and Geeslin, L. E. (1938). *Sth. med. J.*, Nashville, 31, 1155.

## Medical Memoranda

### A Case of Generalized Vaccinia treated by Convalescent Vaccinia Serum

The following account will be of some interest as the administration of convalescent vaccinia serum for the treatment of generalized vaccinia has not been previously recorded.

#### CASE RECORD

A female infant aged 6 months was vaccinated on Aug. 27, 1943. Government lymph was used, and subsequently the Director of the Government Lymph Establishment reported that 23 other infants had been vaccinated with the same batch of lymph and no complaint of untoward results had been received by him. One insertion was made. By the time of inspection, a week later, a single small vesicle had developed and the vaccinia seemed to be running a normal course, but 10 days after vaccination the site became inflamed and indurated, vesicles appeared on the head and thorax, and the eruption then became general. The child was feverish, she became lethargic, and her condition deteriorated, and on Sept. 11 the local medical officer of health, having been called in to see the case, made arrangements with one of us (G. C.) for her immediate admission to the Poole Infectious Diseases Hospital at Alderney. He was advised to report the occurrence of generalized vaccinia and the gravity of the patient's condition to the Ministry. He did so by telephone, and to the medical officer (A. A. J.) who received the message the circumstances seemed suitable for a trial of convalescent vaccinia serum as suggested by Gordon (1941). A stock of this type of serum donated by successfully vaccinated healthy young adults about one month after the performance of vaccination has been placed by the Director-General of Army Medical Services at the disposal of the Ministry for use in civilian cases of post-vaccinal encephalitis. It is stored at the Government Lymph Establishment, and from there dried serum and a quantity of pyrogen-free water sufficient as a solvent to make 20 c.cm. of the serum were dispatched to Poole by rail.

On admission to hospital the child was in a toxic condition and appeared to be dangerously ill. She was pale, limp, and lethargic, and was roused with difficulty. She did not cry except when the injections were given, and then only half-heartedly. A slight cough was present and the stools were green. There was a sero-purulent conjunctivitis and the right eye was almost closed, the eyelids—particularly the right upper, on which there was a septic pustule—being oedematous. Twitching of the right side of the body was noticed. The temperature was 100°. On the trunk, limbs, face, and scalp there was a pustular rash resembling in character that of smallpox, but more profuse on the scalp than elsewhere. The vesicles and pustules were about a quarter of an inch in diameter. An area approximately one and a half inches in diameter centring on the vaccination site was inflamed and indurated, and the site

itself was pustular and exuding sero-pus freely. That night 3 c.cm. of the serum—the dose regarded as appropriate to the age of the patient—was injected intramuscularly. The temperature fell to sub-normal during the night and the child appeared less toxic, but next day (Sept. 12) the temperature rose to 101.4°. The rash appeared to be drying up on the trunk, but on the head and in the folds of the neck was still moist; the eyes had not ceased discharging, but were less oedematous. On that evening 4 c.cm. of serum was given intramuscularly. The next morning the temperature was 102°, but in the afternoon a change was evident: the temperature became normal, the lethargy disappeared, and by evening the child appeared to be better. That night she slept well, and by the morning of Sept. 14 she looked bright and normal. It was noticed that the pustules were drying up and crusting; and that the reaction round the vaccination site was subsiding. The temperature remained normal during the rest of her stay in hospital; the rash, however, being septic, was slow in healing, but by the end of October all the lesions had completely healed. Faint scarring was left on the face and scalp. The general condition of the child on discharge from hospital was excellent.

### COMMENT

The presence of encephalitis has been considered. The chance of the concurrence of such rare conditions as post-vaccinal encephalitis and generalized vaccinia is remote, but the possibility exists. Less than a dozen cases have been published; most of them are not substantiated, and the few that may be accepted are not rigidly unequivocal (Jubb, 1943). As to the present case, the concurrence of encephalitis is not to be readily presumed, for though encephalitis is not a characteristic of generalized vaccinia the sensitivity of the infant central nervous system to febrile and toxic states is well known, and that could have been the explanation here. So, while encephalitis may not be entirely excluded, we prefer to regard the case as one of generalized vaccinia in which the toxæmia disappeared quickly after the administration of a serum containing specific antibody. That the serum favourably influenced the rash and accelerated its decline is suggested, but the condition of sepsis no doubt prevented any striking confirmation of this effect.

GEORGE CHESNEY, M.D., D.P.H.,  
 Medical Officer of Health, Borough  
 and County of the Town of Poole.

A. A. JUBB, M.D., D.Sc.,  
 A Medical Officer of the Ministry of Health.

#### REFERENCES

- Gordon, M. H. (1941). *British Medical Journal*, 2, 822.  
 Jubb, A. A. (1943). *Ibid.*, 1, 91.

### Control of Crab Lice

Crab lice (*Phthirus pubis*) present a troublesome though minor problem, and most of the usual methods for dealing with them are inefficient and also necessitate shaving, with subsequent discomfort to the patient. Organic thiocyanates have been shown to be very effective against head and body lice (Busvine and Buxton, *B.M.J.*, 1942, 1, 464). These chemicals are also lethal to crab lice. Two substances—lanette 384 special and technical lauryl thiocyanate—have been used against head lice. The first of these is rather irritant to the human skin and causes great discomfort when applied to the genitals, so it is not suitable for treating crab lice. An emulsion of technical lauryl thiocyanate caused little discomfort and was very effective. The emulsion was made up as follows:

Lauryl thiocyanate ..	50 mls
Lanette wax S.X. ..	20 g.
Water ..	950 mls

The lanette wax was melted on a water bath, the lauryl thiocyanate added, and the mixture heated to a temperature of between 60° and 70° C. The mixture was poured into the water, previously heated to the same temperature, and stirred until cold.

In all, 177 patients suffering from crab lice were treated with the emulsion, which was applied to the affected areas; the hair was never shaved. One application only was given, and this took under 10 c.cm. of the emulsion. The clothing and bedding of each patient were disinfested. No single relapse occurred in the 177 cases so treated. It should be remembered that crab lice may be found on hair on any part of the body and not only in the pubic region.

"Technical lauryl thiocyanate" is a commercial product, and not a pure substance; all batches may possibly not be equally effective insecticides.

Sorby Research Institute, Sheffield.

KENNETH MELLANBY, Sc.D.



## Reviews

### PSEUDO-SCIENCE AND THE ART OF MEDICINE

*Nervousness, Indigestion, and Pain* By Walter C. Alvarez, M.D.  
(Pp. 488, 25s.) London: William Heinemann

It is to be hoped that this timely book will carry the more weight because the author of *An Introduction to Gastroenterology* cannot be suspected of indifference to the claims of the laboratory. In the present volume, entitled *Nervousness, Indigestion, and Pain*, Prof. Alvarez castigates a pernicious tendency in modern medicine to rely unduly on laboratory tests to the neglect of clinical investigation. We may justly hope that this abuse does not flourish here to the extent he indicates it prevails in the United States, but if we say we are without sin in that respect we deceive ourselves. What could be worse than such an occurrence as this: "Much-travelled patients have told me of their experiences with one busy consultant after another who did not say ten words to them until every conceivable test had been made by laboratory workers, roentgenologists, and specialists. Then the doctor glanced over the pile of reports, commented on the positive findings, promised to mail a copy of the record, gave a prescription or two, and led the way to the door." This is solemn pseudo-scientific quackery. Many of such tests were carried out by "laboratory girls," who, we gather, are not fully trained. What leads to such a state of affairs? Partly it is the outcome of a machine-minded age. As the late Dr. Crookshank sarcastically remarked, "What the patient says is not evidence, what a lever traces on a smoked drum is evidence." Partly it is done to impress the patient and largely to shelve responsibility; also there can be little doubt that it is often in answer to the patient's demands. Particularly this is likely to be the case with a psychoneurotic who dreads the verdict of "just nerves" so much that he or she is insistent on a physical cause being found. But this does not excuse the omission to make a routine clinical examination. In one case described all sorts of tests were done, but not a blood count; nor was the abdomen palpated till the patient went to a good general practitioner, who at once felt a large spleen, looked at a blood film, and in a minute diagnosed leukaemia. Another vicious plan is to carry out all the tests when at the outset the cause had been found, such as a carcinoma of the stomach or rectum.

One feels that there must be something fundamentally wrong with an education which can permit this state of things. Prof. J. A. Ryle has indicated one important factor. When a new patient is admitted the chief assistant and house-physician try to collect all the evidence they can before the arrival of the visiting physician. It is important that the chief should first go over the case from a purely clinical standpoint, and push the diagnosis as far as he can before he allows the laboratory reports to be looked at. Actions speak louder than words, as we know, and when the student observes the order in which his superiors proceed he naturally puts the emphasis in the wrong place. What they seem to think important must be so to him. The result of such methods is familiar to most examiners. Recently out of 50 candidates asked the simplest way to distinguish between obstructive and non-obstructive jaundice only three said they would look at the stools; all the others said they would have a Van den Bergh test done. A test of doubtful validity as opposed to a simple conclusive observation. Candidates often refuse to diagnose a straightforward case of aortic regurgitation without a Wassermann reaction, and will ask for an electrocardiogram without feeling the pulse. When directed to do so it seems to convey no information to them. One could multiply examples. At the present time expense is often a deterrent to the performance of tests that are not really necessary, and we may well speculate on what may happen if that expense is charged to the taxpayer.

This is not scientific medicine, and the art of medicine is not, as some correspondents to our columns have contemptuously maintained, merely a good bedside manner. It is an acquired skill in assessing the whole personality and outlook of the patient. And the book before us is full of good advice on that aspect, some of which might seem rather elementary and naive if the earlier sections had not shown

how urgent is the need for it. The prime importance of taking a full history is emphasized repeatedly; most physicians find that with increasing experience they devote a larger part of their time with their patients to this, and they can carry out an adequate examination in a shorter time. The author calls attention to one melancholy result of failure to elicit all the factors in the history: the light-hearted way in which his surgical colleagues open the abdomen repeatedly for vague pains without proper inquiry into psychological factors.

It is sometimes complained that students are not sufficiently informed as to the proper approach to a sick person and the management of the environmental conditions. This book will give them much practical help on such points. But it is salutary reading for all practitioners as showing that pseudo-science can harm medicine as much as any of the superstitions of the past. Each chapter is headed by several pertinent quotations. We will present the author with a motto which would serve for the whole book—"In clinical medicine the laboratory is a good servant but a bad master."

W. L. B.

### OPERATIVE SURGERY

*Modern Operative Surgery*, Edited by G. Grey Turner, Vol. 11 (In two volumes) Third edition. (Pp. 2,236, illustrated 55s.) London: Cassell and Co.

It is now nearly ten years since the second edition of *Modern Operative Surgery* was published, and twenty years since the first edition appeared under the editorship of H. W. Carson. During that time it has established itself as an authoritative work, which is recognized as being truly representative of sane British surgery. While the second edition was in preparation the original editor died and the work was completed by Prof. Grey Turner. He continues as editor of the third edition, the second volume of which is now under review. For the most part the authors of the various sections are unchanged, but neurosurgery is now in the hands of Prof. Jefferson, Mr. Ogier Ward writes on the bladder and prostate, Mr. Negus on the upper respiratory passages, Mr. Gardham on the mouth and tongue, while the gynaecological section is by Mr. Rivett.

In general the book may be described as well balanced both in matter and in outlook. The authors have carefully avoided the temptation to make it a mere catalogue of all possible operations and have devoted their space to a detailed account of the workaday operations of general surgical practice. This is all to the good, for it makes the volume extremely valuable to the more junior surgeons who have scarcely enough experience as yet to justify individual opinions or methods, and to older surgeons who may find themselves called upon to perform operations a little outside their usual sphere. The opinions expressed are quite sound; whether it be in the choice of procedures or in estimating prognosis, there is little in the advice given at which any broadminded surgeon would cavil. The general standard of the information in all sections is so high that it would be invidious to pick on one for special mention, yet the reviewer was particularly impressed by the quality of the entirely new chapter on neurosurgery. Here the general surgeon will find an excellent epitome of the modern surgery of the brain, in which all the salient points are adequately described. It is a chapter displaying that breadth of view which one associates with authors who have a wide general experience in addition to their specialized knowledge of a particular subject.

The illustrations throughout the book are numerous and of high quality; the production is much better than would be expected in these days of quantitative and qualitative paper restrictions.

### UNIT MEDICAL RECORDS

*Unit Medical Records in Hospital and Clinic*, By Dorothy L. Kurtz, (Pp. 110, 52.00 or 13s. 6d.) New York: Columbia University Press; London: Oxford University Press

There are three parts to any efficient system of medical record keeping. The first is the actual writing of the notes. The second is the affixing of a diagnosis and the preparation of indexes of names and diagnoses. The third is the presentation of the individual record in a convenient and accessible form. It is with the third of these things that this book deals. Medical records will become increasingly important in this country with the development of health centres and the establishment of a national consultant service. Miss Kurtz outlines



a system in which the notes on all the admissions of a patient to a hospital are bound together, and all these notes—in-patient, out-patient, and follow-up—are arranged in chronological order. This seems easy in theory, but in practice it is extremely difficult if the note is to be continuously and easily accessible. It will rarely be possible to duplicate exactly the system followed at the Presbyterian Hospital, from which this book comes, for much depends on the physical structure and layout of the clinic or hospital. But a very great deal can be learned from their 25 years' experience.

We have long recognized the need for instruction in the making of medical case histories both as a training in accurate observation and as a means of recording what has happened to the patient. We have been slower to learn that much of the value of this material is wasted if it is not accurately indexed and filed. A detailed note of a single patient's admission to a hospital may cost at least £1 if the cost of paper, typing, records clerks, overhead charges on equipment, etc., is fairly assessed. Many people, lay people especially, wonder whether his money is well spent. Its first value is to the patient, particularly if he comes again under medical treatment and reference must be made to his previous illness. We have also mentioned the value of the note as a professional discipline, whether the writer is a student or a qualified practitioner. The third use of the note is as the source material for morbid statistics. Finally, it may have value for clinical research, though we agree with Miss Kurtz that material for clinical research is more likely to be obtained from current than from past records. Research, in fact, depends on planned seeking. For all these reasons accurate detailed notes and practicable filing systems are essential. The Americans have found it desirable to create an association of medical record librarians to advance and standardize the quality of medical records, and some such ancillary profession seems a necessary corollary to the co-ordination and up-grading of hospital treatment which are taking place in this country. Record keeping, like business management, is something that has to be learned, and Miss Kurtz has written an indispensable textbook.

### Notes on Books

The monograph by Dr. HUGO ROESLER *Clinical Roentgenology of the Cardiovascular System* was noticed in these columns on its first appearance in 1937, when we said that it bore the stamp of careful thought and personal observation and showed on every page the author's intense interest in his subject. A second edition has now been published by Charles C. Thomas of Springfield and Baltimore and is distributed in Britain by Baillière, Tindall and Cox at 41s. The steady progress in this field of medicine is reflected by the many additions to the text and to the bibliographies at the end of each section. Dr. Roesler expresses his acknowledgment for much help received from colleagues connected with Temple University Hospital and Medical School, Philadelphia.

A little slimmer than usual, and manufactured according to wartime rulings, the 1943 *Year Book of Pediatrics* (Chicago: The Year Book Publishers; \$3.00), edited by Prof. I. A. ABT with the collaboration of Prof. A. F. ABT, makes a welcome appearance. It summarizes available literature—and the qualifying adjective excludes apparently all French, Scandinavian, Dutch, Belgian, and German periodicals. Perhaps for this reason articles which have been published in England seem more numerous than usual this year. The annotations chosen are grouped in over twenty sections and there are 76 illustrations. A subject-index and an index to authors complete the volume. The editorial comments are succinct and valuable, and a high standard of critical writing characterizes the whole book. Those interested in the health of children as well as in disease problems, common and rare, will find much of interest in this popular annual.

It is possible for a doctor to get a wider view of a cross-section of conditions and different types of prisoner-of-war life than others who are destined to stay for long periods in one camp. *The Sun Stood Still*, by J. C. MUSTARDÉ (The Pilot Press; 8s. 6d.) describes the experiences of a doctor who has moved from various camps and hospitals in both North Africa and Italy, and has thus had a broad insight into what actually goes on in these places. It gives the impression of being a just and accurate account of what it really is like to be a prisoner of war, without undue exaggeration for propaganda reasons, or camouflage due to the typical British habit of understatement. It is interspersed by gems of poetry, simple

but none the less philosophically profound. The vein of humour which runs throughout makes it a pleasure to read. Dr. Mustardé has lifted the veil from prison-camp life in such a vivid and delicate manner that anyone who wishes to know how the other half lives can be strongly advised to read this book; but it is also of special value to those interested in prisoner-of-war problems.

## Preparations and Appliances

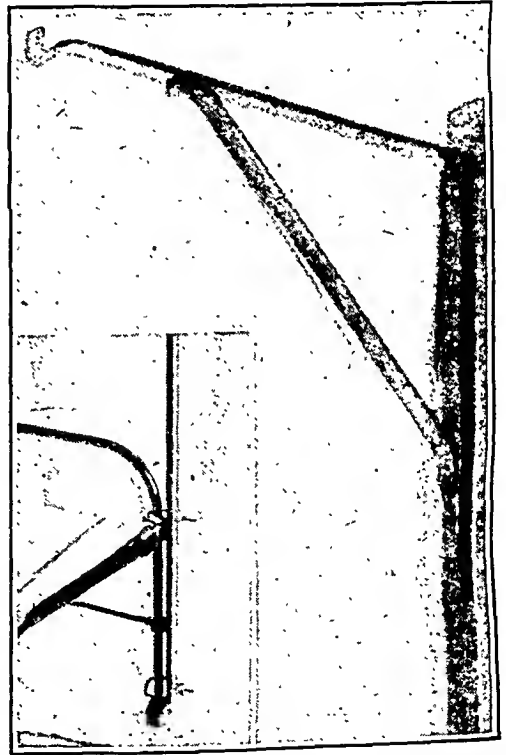
### A TRANSFUSION STANDARD

Dr. V. H. COOPER (Loughborough) writes:

The type of transfusion standard described and illustrated here has been used in the local hospital and may perhaps be worth noting.

This standard consists of a 1 in. x 1 in. wooden upright 5 ft. in length, with a hook screwed into the head, or if elaboration is required an angle bracket with a loop at the free end, as shown in the illustration (the photograph shows this type of bracket merely because some were available; they are a refinement, not a necessity). At the lower end of the upright are two holes through which run bolts with thread and wing nuts at one-half and bent distally in the form of a hook; these bolts are about 16 in. apart (see smaller photograph inset on the left).

By unscrewing the wing nuts the standard can be quickly slipped on the uprights of the hospital type of beds at any corner, top left or right for right or left arm, or bottom left or



right for left or right leg, and then the wing nuts are rescrewed to requisite tightness to fix the standard to the bed. The standard can be varied in height in different hospitals according to the minimum head-room present, so that should the standard be affixed to a trolley, in the event of a transfusion being given in some place other than in the ward—i.e., operating theatre—the apparatus does not foul doorways, etc., when the patient is moved about.

The advantages of this standard are: (1) Its cheapness, simplicity, and ease of making. (2) It can be used for either arms or legs, unlike wall fixtures. (3) Being near the limb it requires only a comparatively short length of tubing and there is consequently less tendency to kinking, etc. (4) It is stable and therefore cannot be overturned like some standards. (5) It is moved with the bed, and therefore cannulae are not so readily pulled from the vein; it is also more convenient for nursing. (6) It can be fixed to the theatre trolley and transfusion given in the leg while the operation is proceeding, so that on transit the level of the bottle and its relation to the patient are constant and a regular flow of fluid is maintained. (7) Unlike wall fixtures only a few are needed.

## BRITISH MEDICAL JOURNAL

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## PSYCHIATRY AND SOCIETY

The White Paper on medical services says little about mental health; but it is admittedly a skeleton, or (less ominously) a clothes-horse, waiting to be decked with the intimate detail of material which will display its whole significance to the large family that resides in our island home. Perhaps if it had been remembered that the total number of beds that has to be provided for the major sort of mental illness is comparable to the total number of beds provided for all other forms of illness put together the authors of the White Paper might have felt obliged to say more even at this stage; but perhaps they were comforted by the thought that these beds were held mainly under the jurisdiction of local authorities. In Scotland, however, the voluntary or Royal hospitals provide for no fewer than a fourth of the total number of mental invalids. It is perhaps in consequence of this unequalled voluntary effort that it is from Scotland, in the annual report by Prof. D. K. Henderson on the work of the Royal Edinburgh Mental Hospital, that there comes a plea that mental and nervous disorder should be given consideration equal to that accorded to physical ill-health. It is not without significance for the planning and the organization contemplated in the White Paper that Prof. Henderson's plea met with instant recognition in the columns of our contemporary the *Scotsman*. The coexistence within a compact community such as Edinburgh of autonomous bodies like the Royal Hospital and an independent and locally representative newspaper probably makes more readily for mutual appreciation than would be possible in a highly centralized organization, divided as it would have to be geographically in its general administration from most of the communities it was designed to serve. Personal contact is the great catalyst of progress.

Prof. Henderson, mindful that the mental hospital in-patient represents only a fraction of the field of psychiatric medicine, and that reliable estimates have placed the incidence of psychogenic illness as a whole at anywhere from a sixth to a third or more of all the ailments the family doctor meets in his daily round, looks further and sees that doctors with training in psychological medicine may be destined to play a part in furthering the stabilization and solidarity of the community. In this, the *Scotsman* suggests, he would be walking hand-in-hand with the politician—"no bad thing, as politicians exist who are less skilled in the appreciation of social behaviour and

emotional reactions than they might be." That this is so few will deny, but they will also be disposed to question the psychiatrist's qualifications for this ambitious and anxious role. His claim is based partly on the fact that he is predominantly concerned in his daily work not with the "manifest content," as he would call it, of what people say nor with the ostensible reasons for what they do, but with their underlying motives, which are often so very different from their professed intentions. How important this can be for politicians is lucidly shown in a recent book on the psychology of politics, in which Mr. James Burnham, using psychiatric principles, declares that the laws of political life cannot be discovered by an analysis which takes words and phrases, either spoken or written, at their face value. "Logical or rational man plays a relatively minor part in political or social change. Non-logical man, spurred by environmental changes, instinct, impulse, interest, is the usual social rule." The opposing, more orthodox, view "has conceived history as the rational attempts of men to achieve their goals."

It is a curious fact that until the advent of dynamic medical psychology, textbooks of "pure" psychology were almost devoid of information or even of speculation about human motives. Knowledge of this kind has until recent years been reserved for men of the world. There is no reason, however, to suppose that this worldly wisdom cannot be comprehended scientifically, and more exactly and usefully. The scientific study of motives, temperaments, and attitudes is the subject-matter of psychological medicine, which, beginning with the exaggerated and more easily detected processes of disease, is now, especially under the impact of war, coming to be concerned with the normal person and his aptness for special tasks, such as holding a commission or flying an aircraft; in brief, with "positive health" in the mental field, in the same way as general medicine is being stimulated in the maintenance of physical fitness.

The *Scotsman*, referring in particular to the psychiatry of politics, says with truth that "the undertaking of such a delicate social therapy and surgery will require an intellectual, a scientific, and a humanistic endowment, on the part of those engaged in such work, of a very high calibre." It is of the utmost importance, if psychiatry is to play its proper part in building up and maintaining the health of the community, that it should attract recruits from among those with the best brains and the soundest character in the medical profession. Special attention must therefore be paid to making a thorough training in psychiatry as readily available to the aspirant as are facilities for study in other branches of medicine. Such institutions as the Maudsley Hospital, the Tavistock Clinic, the Cassel Hospital, and the Burden Neurological Institute have already done much in this way. Prof. Henderson has long advocated the institution of psychiatric clinics in general hospitals in this country; and the opening, after a delay due to war exigencies, of the first *ad-hoc* psychiatric clinic in a general teaching hospital in this country, the York Clinic at Guy's Hospital, signalizes the beginning of an additional type of hospital provision that is needed for the training of the psychiatrists and the nurses of the future.

## TOXICITY OF THE DIAMIDINES

On March 4 we recorded evidence suggesting that the trigeminal anaesthesia which since 1916 has been attributed to trichlorethylene was really initiated by a decomposition product, dichloroacetylene. Now Sen Gupta<sup>1</sup> has described 17 cases of this condition arising among 104 patients with kala-azar who have been treated with 4:4'-diamidino-stilbene (stilbamidine). The symptoms complained of were sensory disturbances, dissociated anaesthesia, loss of light touch with preservation of the sense of pain and temperature, over parts of the area supplied by the trigeminal nerve. There were no nerve lesions elsewhere. The dissociated anaesthesia locates the lesion in the principal sensory nucleus of the fifth nerve situated in the pons. There is no evidence of any danger to life, and after the paresis is fully established the tendency is to a slow recovery. The symptoms mostly appeared insidiously three to four months after cessation of the treatment.

Hawking and Smiles<sup>2</sup> showed that stilbamidine when exposed to ultra-violet light gave a brilliant blue fluorescence which is visible down to dilutions of 1/1,000 million. By this method they established that the substance is absorbed in large quantities by living trypanosomes, and that in mice it is stored in the liver and kidneys. Henry and Grindley,<sup>3</sup> making use of this method, found that stilbamidine is absorbed by the red corpuscles. They also investigated the rate of excretion in two adult men. Each was given an injection of the drug, and the excretion was comparatively high in the first two samples of urine only. Then followed a diminishing rate of excretion until after two and a half days it became undetectable. The total amount of drug excreted over this period was only 10% of the amount injected. There is, therefore, no doubt that much of the drug is retained in the body; but the long latent period before the development of symptoms of trigeminal anaesthesia seems to suggest that these may be brought about by some decomposition product. There is certainly no obvious chemical relation between dichloroacetylene and a 4:4'-diamidino-stilbene; but that they or their derivatives have a selective toxic action on a localized part of the central nervous system suggests that there may be some association. This may be a similarity in the molecular structure of the actual toxic substance which has so far not been established for either drug. Dichloroacetylene is an extremely unstable compound, and its behaviour inside the body will require further investigation.

In 1938 King, Lourie, and Yorke<sup>4</sup> discovered that synthalin (decane diguanidine dihydrochloride) and related guanidines were actively trypanocidal, and later Ewins and his colleagues<sup>5</sup> isolated a series of aromatic diamidines, of which the two most useful have proved to be 4:4'-diamidino-stilbene (stilbamidine) and 4:4'-diamidino-diphenoxy-propane (propamidine). Stilbamidine has had an immediate cure rate of 98% in Indian kala-azar, and the proportion of cases relapsing after a single course of

treatment is very low. Thrower and Valentine<sup>6</sup> showed that, besides the action of these drugs in kala-azar and other protozoal diseases, propamidine possessed bacteriostatic and bactericidal activity against *Staph. aureus* and  $\beta$  haemolytic streptococcus. McIndoe,<sup>7</sup> Morley,<sup>8</sup> Kohn,<sup>9</sup> and Butler,<sup>10</sup> with their colleagues, have reported good results from its use in the treatment of wounds and burns if the methods they described are accurately followed; and Valentine<sup>11</sup> records that a 0.1% solution rapidly cures Morax-Axenfeld infections of the eye. Apart from local necrosis and irritation of adjacent skin when used in high concentration, no toxic reaction has been reported in man after the use of propamidine; but this is probably due to its use mostly by local application. Its effects in animals are like those caused by other diamidines.

Besides the late toxic manifestations described above the intravenous injection of stilbamidine is accompanied by unpleasant reactions. These immediate reactions can be divided into mild, moderate, and severe. Mild reactions are a burning sensation over the body, flushing of the face, and slight giddiness; moderate reactions combine these symptoms with vomiting, epigastric distress, dyspnoea, feebleness of pulse, and sweating; finally, in severe reactions the patient collapses with a steep fall in blood pressure and loss of pulse at the wrist. These reactions have, happily, so far not proved dangerous to life, and can be prevented to a great extent and cured by adrenaline; Wien<sup>12</sup> showed that the fall in blood pressure can be avoided by a previous injection of calcium gluconate. Devine<sup>13</sup> has described the toxic action of stilbamidine on the liver and kidneys in rabbits; these animals showed transient hyperglycaemia and marked nitrogen retention, but death took place in hypoglycaemia. Wien, Freeman, and Scotcher<sup>14</sup> confirmed these findings, and further showed that in dogs and rabbits the serum calcium and potassium levels both fell within a few hours. Certain patients with Sudanese leishmaniasis treated with stilbamidine developed vomiting and loss of weight some months after the disease had been cured. Some of them died with signs suggesting hepatic failure. Fulton and Yorke<sup>15</sup> showed that solutions of stilbamidine undergo a change when exposed to light which greatly increases their immediate toxicity for mice, and thought that this may have been the cause of these mishaps.

The diamidine group of drugs are undoubtedly a valuable addition to chemotherapy. They may replace the antimony group and tryparsamide in the treatment of kala-azar and sleeping sickness, especially since these drugs are not any less toxic. Propamidine deserves a much wider therapeutic trial in the treatment of wound infections than it has so far received. At the same time there is a large field of investigation to complete the story of the toxicity and metabolism of these drugs.

<sup>6</sup> *Lancet*, 1943, 1, 133.

<sup>7</sup> *Ibid.*, 1943, 1, 136.

<sup>8</sup> *Ibid.*, 1943, 1, 138.

<sup>9</sup> *Ibid.*, 1943, 1, 140.

<sup>10</sup> *Ibid.*, 1943, 2, 73.

<sup>11</sup> *Ibid.*, 1944. To be published.

<sup>12</sup> *Ann. trop. Med. Parasitol.*, 1943, 37, 1.

<sup>13</sup> *Ibid.*, 1938, 32, 163; 1940, 34, 67.

<sup>14</sup> *Ibid.*, 1943, 37, 19.

<sup>15</sup> *Ibid.*, 1942, 36, 134; 1943, 37, 48.

<sup>1</sup> *Ind. med. Gaz.*, 1943, 78, 537.

<sup>2</sup> *Ann. trop. Med. Parasitol.*, 1941, 35, 45.

<sup>3</sup> *Ibid.*, 1942, 36, 102.

<sup>4</sup> *Ibid.*, 1938, 32, 177.

<sup>5</sup> *J. chem. Soc.*, 1942, 103.

## DIAMIDINE COMPOUNDS FOR KALA-AZAR

For many years pentavalent antimony compounds have been successfully used in the treatment of kala-azar and in India many thousands of cases have been so treated with a very high percentage of cures. Recently, as the outcome of the work of the late Warrington Yorke and his collaborators, certain aromatic diamidine compounds of a non-antimonial character have also been found effective against this disease. Among compounds of this type kind that have been successfully tried are 4:4'-diamidino-stilbene (stilbamidine), 4:4'-diamidino-diphenoxy-propane (propamidine), and 4:4'-diamidino-diphenoxy-pentane. In a recent communication<sup>1</sup> Napier and Sen Gupta give a careful and valuable analysis of the result of treatment by them of 32 cases of Indian kala-azar by the last compound and in the same number of the *Indian Medical Gazette* the latter author has discussed in an initial editorial the present position in respect to treatment by these new drugs and the pentavalent antimony compounds hitherto in general use. Of the 32 cases treated by Napier and Sen Gupta 21 are classed as "ordinary" and 11 as "resistant" cases. Resistant cases are defined as those in which an ordinary efficient course of treatment (in the present case mostly by antimonial compounds) has failed to effect a cure, or which showed a relapse after a full course of treatment. In the result 19 of the ordinary cases and 10 of the resistant cases were apparently cured, though at the time of writing none of them had been under observation long enough to exclude all possibility of relapse. In one case only was the drug entirely unsuccessful, though two full courses of injections were given. A notable feature was that intravenous administration of the drug was unattended by any serious or alarming "side effects," the immediate reactions to injections being similar to, but very much milder in degree than, those occurring after diamidino-stilbene. Further, no case resembling post-diamidino-stilbene neuropathy<sup>2</sup> was encountered. (The toxicity of the diamidines is discussed in a leading article.)

What are the advantages and disadvantages of diamidino-diphenoxy-pentane as compared with treatment by antimonial compounds and diamidino-stilbene? These are discussed by Sen Gupta in the editorial referred to. In the first place the pentavalent antimonial compounds have been found to cure about 95% of cases in India and are noted for their ease of administration and the extreme rarity of unpleasant reactions. For treatment of the great majority of ordinary cases of kala-azar these therefore still remain the drugs of choice. But for the treatment of those cases that do not respond to the pentavalent antimonials (the resistant cases), whether in India or in the Sudan, diamidino-stilbene is indicated. Diamidino-diphenoxy-pentane possesses a well-marked curative action in kala-azar, in both the Sudan and the Indian forms, but it is less efficient than diamidino-stilbene. In the Sudan it has an immediate cure rate of 75%, and for the Indian form a little higher, as against 95-98% for diamidino-stilbene. Further, as is evident from the cases now recorded by Napier and Sen Gupta, it does not eliminate the difficulty of the resistant case, though a resistant case to one drug may not coincide with a resistant case to the other. But diamidino-stilbene has the disadvantage of producing unpleasant reactions, which diamidino-diphenoxy-pentane does not exhibit, making the former unsuitable for use except in hospital or where special precautions can be adopted. Both the analysis of cases treated by diamidino-diphenoxy-pentane and the editorial on the

general question of the use of these new diamidine compounds, reflecting as they do the unique experience of the authors in this field, should be a most valuable contribution to all who have occasion to treat cases, especially resistant cases, of this disease.

## VENEREAL DISEASE IN SCOTLAND

The report on venereal diseases recently submitted by the Medical Advisory Committee (Scotland) for the most part follows generally accepted lines. After reviewing the statistics of incidence—including the naive statement that "over the past four years at least 58,000 persons in Scotland were admittedly exposed to the risk of acquiring infection"—the committee recommends that the anti-V.D. campaign should include education, prevention, treatment, contact tracing, steps to reduce defaulting, and further legislation. Education should be intensified so as to reach the general public at large and the individual in particular: instillation of a healthy fear of V.D. is all to the good, and more use should be made of the Press. The problem is a moral as well as a medical one, and the Church should play its part by teaching that chastity is the only sure method of avoiding V.D. Education of the young is a very difficult problem, and the committee—very wisely, most will think—does not recommend sex teaching to young people of the 14-15 age group but rather "health" education. Instruction in sex matters and V.D. should be given at a later age, and by selected medical practitioners. Ignorance of venereal disease, what it is and what it may lead to, is one of the great difficulties, and the responsibility for education and publicity should primarily be the duty of the Department of Health, which, however, will probably be glad to avail itself of the services of medical officers of health and voluntary bodies.

The committee favours prophylaxis, but realizes that "other weighty aspects of the problem must be considered before any final conclusions can be formed"; here it is on very delicate ground, and many think that the disadvantages outweigh the advantages. Official approval of prophylaxis may engender a false sense of security and also offend the social and moral code. Is it practicable to provide it universally? Will it be used efficiently? May it not lead to increased promiscuity? And may it not produce latent disease difficult to cure? These are some of the questions raised. On the side of medical organization stress is laid on the provision of laboratory facilities, which should be improved in both quality and quantity: here one is led to ask what proportion of serum tests for syphilis is carried out by really reliable pathologists experienced in the technique. More general blood testing for possible syphilis is needed, especially in pregnant women. Treatment centres should be improved and better distributed. The quality of the service leaves room for improvement both on the clinical side and as regards accommodation, waiting-rooms, etc. Clinics should be parts of general hospitals and not separate self-contained institutions. The patient should be treated with every consideration, and each centre should have a trained staff to deal with the sociological and epidemiological sides. The general practitioner must be included in any venereal disease scheme; his interest in the problem should be aroused; postgraduate courses and laboratory facilities should be available; and medical students should be taught both the clinical and the epidemiological aspects of venereal disease as part of the medical curriculum.

Tracing of contacts and the follow-up of defaulters are two very important sides of the campaign and should be

<sup>1</sup> *Ind. med. Gaz.*, 1943, 78, 177.

<sup>2</sup> Napier, L. E., and Sen Gupta, P. C., *ibid.*, 1942, 77, 71.

undertaken by the Department of Health itself. Merchant seamen are stated to have brought much venereal disease into Scotland, and present perhaps the most difficult problem of all. Amenities should be provided in the ports, and treatment should be readily available. In this connexion a method—not mentioned by the committee—of dealing with early syphilis seems worthy of consideration: i.e., the twenty-day treatment with arsenoxide and bismuth; the whole course is concentrated into a single period of three weeks, and the difficulty of getting injections at various ports is thus eliminated.

The committee thinks that Regulation 33B serves a useful purpose. Its recommendation of "notification," even though anonymous, is likely to meet much opposition, except so far as ophthalmia neonatorum and congenital syphilis are concerned. Will a general practitioner notify his cases, and will he notify the M.O.H. when such patients default? In those countries where notification is compulsory the evidence that it works is inconclusive. It is not the known sufferers who apply for treatment which are the danger, but the infected persons who remain untreated. Nevertheless, the committee's recommendation of compulsory notification was made after weighty consideration. There is no logical argument against notification if venereal diseases are to be regarded as communicable infections endangering the community as much as, if not more than, typhoid fever or measles. The real test is whether notification will or will not promote control of these diseases.

### TYROSINE POISONING

Tyrosine is a key amino-acid, essential for the biosynthesis of adrenaline, melanin, thyroxine, and the hormone of the posterior pituitary. There is some evidence, however, that in addition to its useful functions it may be indirectly connected with the pathogenesis of certain diseases. As a precursor of tyramine, which has a pressor action, it has been related to the causation of hypertension, while as the precursor of melanin it has been suspected as a factor responsible for the occurrence of primary cancer of the liver among coloured peoples. Disturbances of tyrosine metabolism in certain diseases have been noted. Thus Umber<sup>1</sup> and Weiss<sup>2</sup> commented on the urinary excretion of tyrosine in diabetes, hepatic diseases, and in the frequently coexisting pancreatitis. Bickel<sup>3</sup> also noted that tyrosine prevents glycogen storage in the liver, and pointed out its possible importance in the dietary management of diabetes. Litzka<sup>4</sup> observed that tyrosine reduces the blood sugar in patients with exophthalmic goitre, and Abelin,<sup>5</sup> on the basis of animal data, recommended its administration to patients with hyperthyroidism. Abelin claimed that tyrosine is rapidly metabolized and can be given in large quantities without ill effects. This view was supported by Abderhalden,<sup>6</sup> who took 50 to 150 g. of the substance without any apparent untoward effects. But later work by Hueper and Martin<sup>7, 8</sup> suggests the contrary. Rats given tyrosine developed purulent keratitis and redness and oedema of the extremities within a week or two and died shortly after. Post mortem there were degenerative necrotic and fibrotic changes in the pancreas, leading to destruction of both parenchyma and islet tissue. Degener-

ative and necrotic changes were observed in the kidneys, and in the arterioles of the brain, heart, lungs, and kidneys there were swelling and hyalinization of the media and proliferation of the intima, associated with focal haemorrhage, necrosis, and glia-cell formation in the brain. There was also evidence of hypertension. The association of diseases of the biliary system, pancreatitis, and diabetes with tyrosinaemia in conjunction with the observations of Hueper and Martin<sup>8</sup> suggests a possible connexion between these diseases and disturbed tyrosine metabolism. The degenerative arterial changes and hypertension may have been due to the formation of the vasopressor tyramine from tyrosine, or the conversion of the latter into abnormally large amounts of adrenaline or a vasopressor hormone of the thyroid or posterior pituitary. The observations of Hueper and Martin should serve as a warning against the use of excessive amounts of tyrosine for therapeutic purposes, as in the proposed treatment of thyrotoxicosis. Tyrosine is a normal constituent of protein and an essential factor in nutrition. Toxic effects will not occur from the ingestion of the quantities present in a normal diet.

### CORNEAL DYSTROPHY

Corneal opacities of non-inflammatory origin were clearly recognized by Groenouw in 1890. The subsequent literature brought, in the first place, confusion owing to the fact that different observers gave different names to opacities of this kind, and, secondly, some clarification from the recognition that the affection had hereditary features, being sometimes dominant in transmission and at times recessive. A much-needed clarification of the position came with an excellent monograph by Bücklers<sup>1</sup> in 1938. Summarizing the copious literature on the subject and reporting on 129 patients, he was able to correlate clinical and genetic factors and establish three forms of corneal dystrophy: (1) Recessive corneal dystrophy, appearing early in life and running a severe course, the corneal lesion being "macular" or "nodular"—i.e., fairly gross opacities tending to cover the whole of the cornea. (2) Dominant reticular corneal dystrophy, running a less severe course, but still heavily affecting vision, the lesion consisting essentially of interlacing lines and nodules and tending to be confined to the centre of the cornea. (3) Dominant granular type, the mildest of the three varieties, in which there are irregular discrete granules tending to be confined to the centre of the cornea and generally not making their appearance till middle age. This classification was taken over by Franceschetti and Streiff in 1940 in their comprehensive article<sup>2</sup> on corneal dystrophies, and is also used by J. R. Mutch in a more recent publication<sup>3</sup> in reporting an extensive family with dominant granular corneal dystrophy. The basis of these dystrophies is unknown, and Mutch was able to establish the negative fact that there is no correlation between corneal dystrophy and blood grouping.

The attacks of pain and injection to which patients with the recessive nodular type and the dominant granular type are prone may make the diagnosis of corneal dystrophy as distinct from an inflammatory corneal reaction a matter of some difficulty. The clear recognition of these pitfalls is essential if much futile and perhaps harmful treatment is to be avoided. So far the most helpful therapeutic approach, tentatively advocated by Franceschetti and Streiff, is corneal grafting for the more severe forms.

<sup>1</sup> Umber, F., in Mohr, L., and Stachelin, R., *Handbuch der inneren Medizin*, Berlin, 1926, vol. 3, pt. 2, p. 1.

<sup>2</sup> *Klin. Wschr.*, 1936, 15, 521.

<sup>3</sup> *Ibid.*, 1939, 18, 178.

<sup>4</sup> *Ibid.*, 1936, 15, 1568.

<sup>5</sup> *Ibid.*, 1935, 14, 1777.

<sup>6</sup> *Z. physiol. Chem.*, 1912, 77, 454.

<sup>7</sup> *Publ. Hlth. Rep. Wash.*, 1932, 47, 83.

<sup>8</sup> *Arch. Pathol.*, 1943, 35, 685.

<sup>1</sup> *Klin. Monatsbl. Augenheilk.*, 1938, Suppl. 3.

<sup>2</sup> *Modern Trends in Ophthalmology*, Edited by F. Ridley and A. Sorsby. London, 1940, pp. 415.

<sup>3</sup> *Brit. J. Ophthalmol.*, 1944, 28, 49.

# The truth about Vitamins

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Recent action by the Ministry of Food should go a long way towards putting an end to spurious, or even doubtful, vitamin claims. A recent White Paper contained this sentence:—

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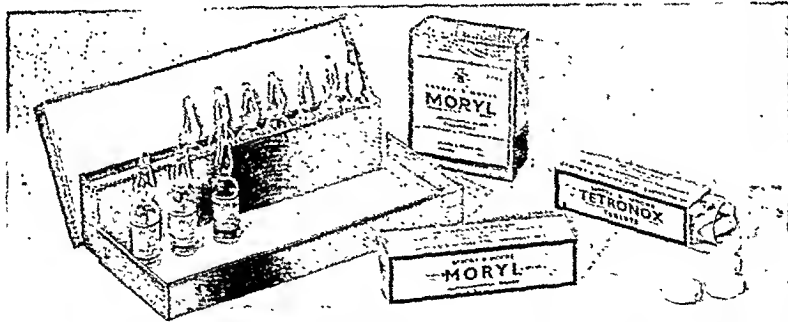
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## POSTPONEMENT OF ANNUAL REPRESENTATIVE MEETING AND PANEL CONFERENCE

### MINISTER OF HEALTH'S LETTER

As announced in the *Supplement* this week (p. 121), the Annual Representative Meeting of the B.M.A., which was to have been held in July, and the Panel Conference fixed for June, have, at the request of the Minister of Health, been postponed. The following is the Minister's letter:

Ministry of Health,  
Whitehall, S.W. 1

May 22, 1944

SIR.—I am directed by the Minister of Health to say that your letter of May 17 addressed to the Secretary of the Ministry of War Transport, regarding the holding of conferences at the present time, has been referred to him. Mr. Willink wishes me to say that, as stated in the recent Press notice, it is desired in view of the difficulties of transport, to avoid the calling of conferences involving travel over long distances, and he greatly regrets, therefore, that the answer to your question must be that the proposed Conference of the British Medical Association in July should, in his opinion, be postponed. He fears that he must also express the same opinion about the Panel Conference which, he understands, has been arranged for June 28.

The Minister naturally regrets any step however unavoidable, which may delay discussions with your Association regarding the proposals in the White Paper for a National Health Service, but he hopes that it will be possible to arrange for the holding of the Conferences later in the year, and he will communicate with you again as soon as it is possible to inform you of the removal of the present restrictions.

I am, Sir, your obedient servant.

(Signed) ARTHUR N. RUCKER.

Dr. Charles Hill,

Secretary,

British Medical Association.

### PROGRESS IN MENTAL HYGIENE

A special meeting of the National Council for Mental Hygiene was held recently under the chairmanship of Lord Alness. The Duchess of Kent, the president of the Council, attended and said a few words on the important part which it had to play in relation to the mental health of the people, especially in view of the accumulated strains of war.

Dr. Helen Boyle, chairman of the Council, recalled the little-known history of its foundation. It could be traced to the publication in America of a book entitled *A Mind that Found Itself*, by C. W. Beers, in which the need for a central organization to give practical direction to ideas on the subject of mental hygiene was stressed. The result was the formation in America of the Committee for Mental Hygiene, and following upon her own visit to the States just after the last war Dr. Boyle succeeded in getting people in Great Britain interested in the same idea, particularly Sir Maurice Craig, a pioneer in the treatment of early mental cases. Dr. Boyle referred to the advances in mental care signified by the Mental Treatment Act, with the admission of voluntary patients to mental hospitals and the provision of clinics. Treatment itself had been greatly improved, but one of the most important changes was the change in public opinion concerning mental cases. In the propaganda necessary to bring about this change the Council had had a considerable share. She hoped that when the war was over something of the comradeship which had been forthcoming in wartime would survive. A very desirable innovation would be some form of club with accommodation for parents and children, because the present provision of recreative facilities tended to separate members of families. In particular the housewife should have some provision which she could enjoy with the rest of her family, for after her experience of real social contacts during the war she was likely to feel lonely and bored, to the detriment of her mental health.

The proceedings ended with the showing of a psychological film entitled *Fear and Peter Brown*, a cleverly drawn picture of a child frightened of the dark, with its fears unallayed by its parents, and growing up into a nervous individual afraid to face life.

## Nova et Vetera

### EARLY MEDICAL WORKS IN EDINBURGH UNIVERSITY LIBRARY

To illustrate a current series of lectures on "The Historical Background to Modern Medicine" there has been placed on view a collection of early printed medical books in the Upper Library Hall of Edinburgh University. Founded in 1580 as a "Town's Library" three years before the foundation of the University, or "Town's College," the University Library remained the only public library in Edinburgh until the establishment of the Advocates' Library a hundred years later. Naturally it contains many treasures, including a number of works of medical interest from which the present selection has been made.

The following are a few of the leading items. Greek classics are represented by the first printed editions of the works of Dioscorides (1499) and of Hippocrates (1536), both from the press of Aldus of Venice, also by the Basel edition of part of the writings of Galen (1536). Arab writers are exemplified by the *Opus medicinarum practicae* of Rhazes, printed at The Hague in 1533, and by two fine editions of Avicenna's *Canon Medicinarum*, one from Venice, dated 1608 (the other, a modern version in Urdu, which appeared at Lucknow in 1887, when this 10th century work was still used by native practitioners of India. There is also on view a beautiful copy of one of the first illustrated textbooks of surgery, Albucasis's *De Chirurgia*, in Arabic and Latin (Oxford 1778). In manuscript form, this is said to have been the leading work on surgery in the Middle Ages. The adjoining cabinet contains four early editions of the popular poem, the *Regimen Sanitatis Salernitanum*, the earliest dated 1486, and the *Chirurgia magna* of Paracelsus (1573). Close by is that early handbook for midwives, now very rare, Eucharius Ruesslin's *De partu hominis* (Frankfurt, 1532). Similar works are Ruell's *De conceptu et generatione hominis* (1587) and the English translation, *The Expert Midwife* (1647). A well-known book of the same nature, and also a great rarity, is Raynalde's *Birth of Mankind* (1564), though the copy on view is not the first edition (1540). An interesting item in the 17th century section is the *Cerebri Anatome* of Thomas Willis, illustrated by his friend (Sir) Christopher Wren. Of the same period is a volume of Zodius's *Medico-gallicus*, the Latin version of the first medical periodical, *Nouvelles Descouvertes*, founded at Paris in 1679 by Nicolas de Blegny.

The most important and valuable items in the exhibition, however, are the two greatest books in all medical literature, Vesalius's *De Corporis Humani Fabrica* and Harvey's *De Motu Cordis*. The beautifully bound copy of the former is the first edition, from the press of Oporonius of Basel, 1543. Beside it lies the fine two-volume edition, printed at Leyden in 1728, by Boerhaave and Albinus. The first edition of Harvey's account of the circulation of the blood is now an extremely rare little book, dated from Frankfurt, 1628. Visitors to the exhibition have the opportunity of seeing two perfect copies, one of which belonged to Alexander Monro, the third of the dynasty of professors of anatomy of that name. The first Alexander Monro, when appointed to the chair in 1720, kept a list of his students, which is now shown, as also is a printed copy of the first thesis to be presented for the degree of M.D. Edinburgh. It is entitled "De Dolore," by John Monteith, and the date is 1726. Another manuscript relating to the Edinburgh Medical School is a letter of advice, dated Feb. 10, 1704, from Dr. Archibald Pitcairne, one of its founders, to his patient the Earl of Wintoun. The adjoining copy of Pitcairne's *Dissertationes Medicae* bears the author's seals and signature.

Later works on view are the second edition (1800) of Edward Jenner's *Inquiry into the causes and effects of variolae vaccinae*, the first British edition of Beaumont's *Experiments and Observations on the gastric juice* (1838), Morton's *Remarks on the mode of administering ether* (1847), and J. Y. Simpson's *Account of a new anaesthetic agent* (chloroform), 1847. Another landmark of medical literature is Lister's *Introductory Lecture*, delivered in 1869 when he succeeded James Syme in the chair of clinical surgery at Edinburgh, and with it may be seen a manuscript set of notes of Lister's lectures, in the writing of one of his most distinguished students and successors, Prof. Caird.

A feature of the exhibition, and the most spectacular item, is a fine collection of illustrated Herbals, including a magnificent copy of *De Historia Stirpium*, by Leonard Fuchs (of fuchsia fame), dated 1542, with lovely coloured woodcuts, and a catalogue of the Physic Garden of Edinburgh (1683), by the first professor of botany, James Sutherland.

The exhibition, which has been arranged through the kindness of Dr. Sharp and the Library Committee of the University, will remain open daily from 10 to 4 (except Saturday and Sunday) until the end of May.

D. G.

## Correspondence

### Medical Education: Principles and Method

SIR,—Most readers will agree with your view that the report on medical education of the Planning Committee of the Royal College of Physicians is a welcome advance upon its predecessors on social and on psychological medicine in that it proposes a coherent scheme of education, and not the extensive additions to the present overgrown and obsolete structure that they advocated.

Yet it may be submitted that, for a report intended as a guide to action for university and other bodies sharing responsibility for medical education, it lacks the clear definition and exposition of its operative terms essential to this end. Thus, in one of its key paragraphs—namely, para. 62—the word “method” occurs on almost every line, but it is used in a different sense in each case: referring now to techniques, now to observation, and now to the inductive process. In the last sense it is substituted by the word “principle” at one stage of the argument, and we are finally told that “method” and “principle” are two distinct objectives. The final impression left by this important paragraph is one of incoherence, and the reader feels that these significant words have been used rather as detonators, creating an impression on the reader, but conveying no information because they embody no clearly thought out notions in the minds of the authors.

Now, the distinction between the theoretical and vocational elements in a medical training is one not universally appreciated, and it was therefore the more essential that the report should have been clear and explicit about them, that it should define its terms, use them consistently, and exemplify them adequately. All these the report signally fails to do, and thus may be said not to have risen to the height of what should be a vital occasion in the history of medical education. No one seeking to learn what are the principles and method in which the medical student should be grounded will find the answer in the report.

As a clinical teacher I have been impressed by the ignorance betrayed by the medical student coming to hospital fresh from his pre-clinical studies of what may be called the general principles of scientific thought; those we speak of as natural laws, and the processes by which we can know anything—that is, the structure of experience. I have yet to meet such a student who has a clear idea of what is meant by a natural law or how it is defined, who realizes that all science comes from the meeting of the observational and conceptual orders of experience, appreciates the distinctions between the two, what notions belong to the one and what to the other, or who has any idea of the limitations of the observational order. Yet most of them are bursting with facts about the most recondite chemistry of the vitamins and the most recent techniques of electrophysiology, which have burdened their memories to little purpose. I suggest that this is because the teachers of the pre-clinical subjects are themselves bogged in their own techniques, and entertain nothing more general in the way of ideas than unrelated snippets of theory belonging to these techniques. They do not teach the general principles that underlie and should unite all scientific disciplines. Yet surely we have the right to expect that, after three years at least devoted to scientific studies, the student should know the rudiments of the principles involved in scientific thought and method. Nothing is clearer than that he does not, and by the time he reaches the clinical teacher it is already too late to change his entire way of thought. If the new medical graduate emerges finally from his tutelage merely the incomplete master of a number of unrelated techniques the clinical teacher is neither wholly nor primarily to blame. Reform must begin at the beginning of the medical course.

Finally, it may be permitted to doubt whether intelligence tests will solve the difficult problem of selecting students for the medical course. These assess only an arbitrarily chosen fraction of the human mind, and are carried out by wholly unstandardized performers. It is an odd commentary on current opinion on this subject that we should be so ready

to accept, as adequate tests, procedures carried out by uncalibrated human instruments. When shall we test our intelligence testers? Students of Whitehead's *Modes of Thought* and *Adventures of Ideas* will appreciate the inadequacy of current ideas among scientists as to the nature and mode of action of intelligence, and the sources from which the structure of experience is built. Trotter, also, in his lecture, “Has the Intellect a Function?” has indicated that more realistic ideas on the subject are a necessary preliminary to any satisfactory calibration of the intellect.—I am, etc.,

London, W.1.

F. M. R. WALSHIE.

### Medical Education: Need for Staff College

SIR,—One's first reaction to the Report of the Planning Committee of the Royal College of Physicians is a feeling that the College might have done something about it sooner. For generations the influence of the two Colleges over the medical course has been paramount. Nearly all the students in England and Wales have taken their examinations as their first qualification, and these examinations have largely, if not entirely, determined the scope and type of the teaching given in the schools. The officials and examiners of the Colleges have all themselves been teachers. The College of Physicians, therefore, cannot evade its share of blame for perpetuating a system which it now condemns in such vigorous terms. But not a moan of contrition, not a sob of remorse can be heard from Pall Mall East.

The committee has taken as its model Karl Pearson's dictum that “the true aim of the teacher should be to impart an appreciation of method”; surely the most narrow-minded definition ever proposed. In consequence, although it set out with the avowed object of improving the course as an education it has merely succeeded in suggesting improvements in technical instruction. One searches in vain for a vision of the problem from the broad philosophic point of view, of the kind which has been outlined by Sir Thomas Lewis and Dr. F. M. R. Walshe.

Many of the recommendations were well within the power of the schools to carry out on their own initiative. Pre-clinical teachers, says the report, should make use of clinical material. But clinical material has been theirs for the asking; they have not wanted it. Pre-clinical teachers, says the report, should be attached to clinical departments. But for years clinicians have been begging pre-clinical teachers to go into the wards; and still they don't go for the simple reason that they don't want to go. These and similar recommendations will never overcome the tremendous strength of tradition and of the centrifugal force of departmentalism unless their advantages are conclusively demonstrated. They will merely be adopted in a perfunctory manner and quietly allowed to sink into oblivion.

However attractive the recommendations may look on paper there is no guarantee that they would stand the test of experience. The curriculum has grown up haphazard on expediency and opportunism, lacking natural cohesive elements and having little basis in the fundamental principles of education, and its reform must be undertaken not by adjustments of the existing structure but by building a new structure on more solid foundations. This task can only be accomplished by the experimental method. We hear enough about the need for research into the causes of disease, but barely a word about the need for research into the teaching of disease.

The report totally ignores the crux of the problem—the training of teachers. While rightly anxious to protect the public from inefficient doctors it suggests no means to protect students from inefficient instructors. The committee is under the illusion that when satisfactory conditions have been provided skilled teachers will drop from the sky. It is an astonishing fact that the training of teachers is most intensive at the lowest level of education and non-existent at the top. Elementary school teachers spend two years in acquiring proficiency learning the principles and psychology of education, studying the works of Spencer and others, and the theories underlying the various methods in vogue—such as the Froebel and “project” method—and receiving practical instruction in teaching. Yet although medicine is at least as difficult to undergraduates as the alphabet is to infants no attention has

ever been paid to ensuring the competence of its teachers as teachers. No system of teaching medicine based on fundamental principles has ever been formulated and tested.

The solution of the problem lies in the creation of a staff college. A medical school attached to a university should be set aside for the purpose. It should have a normal complement of undergraduate students, and its staff should include an experienced lay educationist. Its functions would be to build up a system of medical education and to train clinical teachers. The staff would study the curriculum as a whole and the modification and co-ordination of its component parts. Disease would be studied from its educational aspect by clinical and pre-clinical teachers, including teachers of the basic sciences. Plans decided upon would be tried out on the students and modified according to experience. The staff would also frame the most suitable manuals of instruction, explore the possibilities of special methods such as the use of working models and the cinematograph, and they should establish contact with the Dominions and the United States for the exchange of ideas and teachers.

Courses of instruction would be provided for men aspiring to staff appointments at other schools. These would learn the principles and psychology of general education from the lay educationist, the history of medicine, and the theory underlying the system adopted at the staff college, how it had been arrived at, and what modifications were under consideration. They would learn the art of teaching medicine by listening to the staff and by giving lectures themselves under supervision. They would also learn the difficult art of examining candidates. There would be no need to give the staff college powers to enforce its system on other schools. It would be open to suggestions from outside, but by virtue of the attention it had given to the problem it could not fail to exert a considerable influence on the schools, and it would play a conspicuous part in improving existing schools and creating new ones throughout the Empire.

Any plan to reform the curriculum from the standpoint of medicine alone is doomed to failure. The problem must be approached from the standpoints of medicine and of education combined.—I am, etc.,

Cambridge.

FF ROBERTS.

### Character and Personality in the Medical Student

SIR,—“In future Mrs. Smith's son of Back Alley, Anywhere, may be a doctor”; thus one of the leading daily papers reports the Planning Committee of the College of Physicians. In these days of the social conscience extraordinary indeed are the lengths to which the apotheosis of the so-called under-dog is carried; and, by inference, also the belittlement not merely of wealth and position but of eminence of almost every kind, including wisdom, learning, and refinement. The committee, of which Lord Moran is chairman, point quite rightly to the importance of personality and character in the medical student, traits which they discover to be lacking at the present time. They conclude that the reason for this is that the field of selection is too narrow, and recommend that it should be widened by making all university education free. It is true that a widening of the field will result in all probability in an increased number of candidates for the medical profession, but it by no means follows that it will improve the quality in the direction of character and personality. Indeed it is arguable that the indiscriminate widening of the field with no attempt to sort the wheat from the tares, which has been the trend of the past thirty years, is itself responsible for the deterioration. If that is so, then yet another learned body has added its quota to the general bemusement.

The trouble here, as with other problems of sociology, arises from a failure to grasp at fundamentals. Instead of digging for the root, reformers trim the stem with this or that placebo, and the effect as often as not is a dozen more problems and aggravations in place of one. In this case, as in many others, the fundamental is to be sought in the influence of heredity and of early home life. Millions of pounds are wasted annually in an effort to inculcate traits of character which are hereditarily non-existent, and to germinate ethics of civilization which are promptly and effectively annulled in any home where ignorance, stupidity, idleness, dirt, and vice are the pattern.

Taking the broadest view without prejudice and allowing for the accidents of good and bad fortune, of good and ill health, and, above all, for the waywardness of Nature, it is fair to assume that those who have attained a certain high standard of living have done so by virtue of either their own character or that of their forebears; and, if the laws of heredity have any validity at all, it may be expected that a not inconsiderable proportion of them will pass on those traits to their successors. On the other hand, though it would be wrong to exclude all resources, the most fruitful field of higher civilization is little likely to be found in the worst types of home. Yet that is the conclusion to be formed from the outpourings of some of our social reformers, and the Government, in obedience to the loudest clamour, gives almost direct encouragement to the least worthy to reproduce themselves in the greatest numbers and a corresponding discouragement to their betters. Where can such a policy end but in the deterioration of the race? The laws of heredity and the breeding of the best stock are recognized and practised by man. They are ignored and Nature flouted by man himself solely in relation to himself.

Wealth and position are dangerous side-issues. They are the concomitants as they are often the downfall of eminence. They are not, however, evil in themselves; indeed, they often foster the very best and highest of human characteristics; they are bad only when they become stagnant, unproductive, and surfeited with plenty. Eminent men not infrequently marry empty-headed women, and succeeding generations deteriorate. The Government spends more and more on so-called social reforms, and enters more and more into the control of human lives. As State control, over-industrialization, and over-population increase, so individuality, personality, and character are being ironed out and gradually we become a race of automatons. How can it be wondered at if the medical schools are crowded with men with brains but no character, with precepts but no principles? Decent living, refinement of speech and of conduct, love of poetry or the arts, of good conversation, of wisdom, of learning—all these have been at a discount and have even been scoffed at in the physical and mental squalor of the years between the wars. And now lest any doctor should retain a trace of spirit or of individuality the medical profession is to be centrally controlled and directed; and, harnessed to the Civil Service, is to become the chattel of politics. Where among our leaders are the honest thinkers, outspoken and fearless of unpopularity, who will bear witness to truth, which is as old as the world and as solid and as plain to see.—I am, etc.,

Derby

E. D. BROSTER.

### Eugenic Value of Goitre Elimination

SIR,—The recent memorandum of the Medical Research Council on “Endemic Goitre in England” demonstrates clearly the very marked prevalence of goitre in our community at large. For many years I have been endeavouring to direct attention to this obvious indication of a great and increasing iodine deficiency in our people, and have stressed its deleterious effects upon the general health.

Our future depends upon the health of the nation's mothers and their children, and one must bear in mind that the great majority of our expectant mothers are suffering from iodine deficiency, and in addition to the ill effects this condition may have upon them it is apparent that their offspring are apt to be handicapped even from conception in both their physical and mental development and to be born into a new environment with suboptimal preparation to face the exigencies thereof; in fact, they are not *eugenic* (well-born). I have been urging that no expectant mother should continue to suffer from iodine deficiency, and the same, of course, applies to the community in general.—I am, etc.,

Penarth.

W. MITCHELL STEVENS.

### Water and Population

SIR,—With reference to Prof. D. B. Blacklock's article (Dec. 25, 1943, p. 805) on the population of India, it recalls a discussion I had in Egypt with the Engineer of Water Supply. He gave me the population of Egypt, and said, “If I can provide more water there will be an increase, I think, of about two million people.” I naturally asked, “What happens then?” The reply was, “I know of no solution.”

The same thing is now occurring in India. Sooner or later we must face an insoluble problem. All the hygienic measures may and probably will defer the impasse but cannot prevent overcrowding. The international problem which will arise can be serious enough in all conscience.

So far the only great country with no immediate trouble and with very great resources is Russia. Even the United States, owning, according to Siegfried, half the wealth of the world, will feel it ultimately. It is one of the world's problems which must be faced.

The vast areas in Australia are very sparsely populated because of the lack of water and no means so far of increasing it. They can grow merino sheep, but cannot carry a large population, though the sheep can supply other countries with wool and a certain amount of food. On the coastal fringe where there is water the population can and does increase, but, like the east end of Java and the Sunda Islands, where the climate is similar to Northern Australia, the same trouble occurs, except near the volcanoes, which provide perennial water. Volcanoes in the centre of Australia would make all the difference, but these do not exist. The statesmen of the future will have much to think about.—I am, etc.,

Melbourne.

JAMES W. BARRETT.

### Immersion Foot and Cold Therapy

SIR,—In his letter (*Journal*, Feb. 26) Mr. Norman Lake criticizes certain points in the article written by Major Corbett and myself (*Journal*, Feb. 12). He thinks we imply that frost-bite and trench foot are synonymous terms, but we state clearly in our paper that trench foot is probably the same as immersion foot so long as freezing-point is not reached; at some point below this frost-bite could be superadded. We clearly drew the distinction between frost-bite on the one hand and the probably identical conditions of immersion foot and trench foot on the other hand. We were unaware that he had drawn this distinction in 1915. But evidently our article (written in December, 1942) did no harm in stressing the point, since in 1941 two such authorities as Raymond Greene and Hamilton Bailey (*Surgery of Modern Warfare*) stated that frost-bite and trench foot were probably identical. It is only fair to add that in later publications they stress the distinction. One purpose was to indicate clearly, apart from all theories, what this difference is; we stated that within the area subject to frost-bite all tissues are dead and look dead, and that in the area subject to immersion trauma there is a gradation of injury—nerve tissue suffering most, but the part as a whole is alive and looks alive.

I was impressed by the experiments of Mr. Lake in which tissue cultures were kept alive at the critical temperature of  $-5^{\circ}\text{C}.$ ; they demand no oxygen because their metabolism has been arrested. These experiments give a firmer basis for the view expressed in our article: "Warmth raises the metabolism to a point beyond the capacity of the feeble circulation to supply it. Thus the tissues are brought to a state of metabolic bankruptcy." We claim no special originality for this. Capt. Bigelow and Lanyon in the *B.M.J.* of the same date also express this opinion.

We must agree with Mr. Lake that a cold limb requires a minimal blood supply and that great dangers are involved in bringing back a normal circulation. But nevertheless we have got to bring back the blood supply to normal because we are dealing with a man's foot and not merely a tissue culture, and the circulation must be brought back sooner or later. Certainly local warmth must not be used to increase circulation, because it raises the local metabolic demands of the tissues beyond the capacity of the circulation. Certainly we must not bring back the circulation too fast, because we would only create a barrier of oedema between the tissues and their oxygen supply. Mr. Lake suggests that local vasoconstriction should be used on the affected part, but the trend of modern therapy (and not merely our view) is to produce gentle local arteriolar dilatation reflexly by allowing distant parts to become warm; this is combined with dry cold locally to reduce the metabolic needs to the capacity of the subnormal circulation. This idea is well expressed by Ungley and Blackwood (*Lancet*, Oct. 17, 1942).

All the arguments in this letter are available in our original article, as I think Mr. Lake would agree if he reads it again. He has based his criticism chiefly upon points which are a side-issue to our main thesis—this is the conception that, in immersion foot, there is a wide gradation of trauma within the injured part; we have suggested a reason for this gradation.

The delays in the publication of the original paper and of this letter are inevitable under conditions of active service.—I am, etc.,

B. W. GOLDSTONE.

### Sulphaguanidine in Flexner Dysentery

SIR,—I am grateful to those who have written regarding my article on the above subject. It is apparent that we have not reached the stage when dosage of sulphaguanidine can be precisely stated. However, as the blood levels in my series of cases showed, there is a considerable absorption of the drug. This seems to constitute substantial grounds for exercising restraint in the administration of very large doses to patients who may well be dehydrated.

The extremely high incidence of sensitization rashes in my cases also seems to provide sufficient reason for due care regarding dosage. Criticism has been directed against this chiefly on the ground that such a high incidence has not been the experience of other workers. I can only speak from my own experience. I feel, however, that some of the rashes might have been missed but for the vigilance of the nursing staff. That there were reasons, other than high dosage, to account for the unusual finding is surely too problematical for serious discussion. The importance to be attached to the occurrence of the rashes is a matter of opinion. In view of the severe effects after administration of a test dose of sulphaguanidine in patients thus sensitized, I cannot regard their occurrence with the same complacency as Brig. Bulmer. In any case, assuming that massive dosage is responsible for such toxic manifestations, their imposition on patients is not justified if an adequate lower dosage of this expensive drug can be reached.—I am, etc.,

Glasgow.

H. G. SMITH.

### Kala-azar in Malta

SIR,—Having served as a specialist sanitary officer in Malta during the last war (1915-18), I would like to support the suggestion made by Dr. R. J. Lytle (May 13, p. 670) that kala-azar was probably of more common occurrence in British adults in Malta than was generally realized.

I remember a case not previously referred to in this correspondence: that of Sister B., a member of the staff at St. George's Hospital, Malta, who contracted the infection there. The onset of her illness was insidious—gradually increasing lassitude and weakness, with loss of weight and anaemia. Apart from the increasing severity of the symptoms the only indication of an infection were a suggestive white cell change in the blood and slight enlargement of the spleen. When all other examinations had proved unavailing, splenic puncture was performed and the presence of Leishman-Donovan bodies demonstrated. Although the patient had by that time become very weak and dangerously ill, intravenous injection of antimony led to a complete recovery.—I am, etc.,

JOHN M. GIBSON,

Medical Officer of Health, Huddersfield.

### Marriage and Parenthood

SIR,—The prejudice against definite preparation for marriage which is brought out by Dr. Wrathall Rowe (May 6, p. 636) is felt acutely by all who strive to work on the lines suggested by Dr. Edward Griffith (April 15, p. 540). Such bodies as the Marriage Guidance Council, of which he is a member along with not only other medical men and women but also with progressive clergy and social workers, find their effort to spread information and advice blocked by views that are to our minds, irrational and merely emotional.

I write to suggest that the family doctor could help in dispelling ignorance much more effectively than Dr. Rowe in a fit of depression, believes. Let the value of honest simple teaching about sex be persistently urged upon parents, beginning when the first child first asks questions, and surely they will

demand, not avoid, adequate preparation for marriage when the time comes. Though ideally the family doctor should undertake the premarital examination, the fact remains that young people often find it easier to talk to a stranger. They are shy with the one who knows all about them as they often are with their parents on the deeply emotional matters connected with sex.

I must add that in my experience the outlook of the younger generation is already changing. That all girls should have good talk with a doctor before marrying is an idea frequently and warmly expressed by modern-minded girls. Some come to one for the purpose, or by women who deeply regret having married in ignorance. There is, I am convinced, a growing perception, which we ought to foster, that knowledge does not ruin romance in marriage any more than does the study of technique spoil the artist's joy in self-expression. But we do need to advise with delicacy and sympathy, and with a perception of the values beyond those expressed through the physical and psychological relationships.

The great thing at the moment, I repeat, is to back up the pioneers in insisting upon the value of adequate preparation for life's greatest adventure—that of matrimony—I am, etc.

Hove.

LILIAN M. BLACKETT JEFFRIES

### Anaesthesia in School Dental Clinics

SIR,—We have read with interest the article by Dr. K. B. Pinson on this subject (April 29, p. 588). While agreeing as will, we are sure, all school dental officers of experience, that the figure of 65% of acceptances is unduly low and would be raised, we would suggest that the use of an anaesthetic agent which so often causes nausea and vomiting is likely to delay this improvement, whatever may be the other advantages. Further, the complication of vomiting may cause considerable trouble and delay in the working of the clinic, as well as distress to parent and child.

In our clinic we have for long used nitrous oxide and administered with a Trewby nasal inhaler and commencing with pure gas; except in occasional mouth-breathers we have had very little trouble. Induction is swift, anaesthesia is seldom taken deep, and at the end of the operation the children open their eyes, walk from the chair and rinse in the recovery room. Sickness is so rare as to be practically non-existent, and the good general condition of the children is, we believe, partly due to their being ordered to have a light breakfast two hours before attending. This procedure may now appear old-fashioned, but it has given complete satisfaction to all concerned in what is by now a very large number of cases.—We are, etc.

FIFTEEN ASHWORTH AVE

Surrey County Council Clinic, Morden

E. CLAUSEN, L.D.S.

### Administration of Pentothal

SIR,—There has been much correspondence and controversy over the use and dangers of pentothal anaesthesia. In the coming months many thousand intravenous anaesthetics will have to be administered by practitioners who may not be familiar with their use. While no rule of thumb can ever be devised in medicine which will cover all cases and relieve the doctor of the duty of using his judgment in the individual case, yet general rules can be of great value if adhered to with proper discrimination. To the occasional anaesthetist a following rule seems to me of great value as it allows for a considerable margin of safety, even if the whole dose is injected fairly rapidly: always use the small ampoule (0.5 g.) of pentothal. Forget that the large ampoule (1 g.) exists—I am, etc.

E. MONTUSCHI  
E.M.S. Anaesth. Section

### Tumour of the Breast treated with Stilboestrol

SIR,—The remarkable improvement in a case of scirrhus treated by stilboestrol has encouraged me to send you some notes on the case.

The patient, Mrs. X., aged 90, first noticed a lump in the outer segment of her left breast in April, 1940. When I saw it at this time it was about the size of a golf-ball, hard and irregular in shape, and devoid of pain. A chain of enlarged and hard glands

ran along the outer border of the pectoralis major muscle and merged into a similar clump in the axilla.

It was not considered desirable, on account of her heart condition and her age, to resort to any surgical treatment, and until Dec., 1943, little or no notice was taken of the lump. About this time the patient noticed that she experienced some "soreness" on pressing her arm into her side, and on examination I found a slight enlargement in the size of the tumour, and, although the skin was not involved, there was a dark purplish mushroom-shaped patch of discoloration over the tumour.

On Christmas Day, 1943, treatment by stilboestrol was begun. The dose was one tablet of 0.5 mg. thrice daily. In five days the pain caused by the pressure of her arm had disappeared and the lump itself gradually became smaller. Her general health has improved, and to-day the tumour is about the size of a small walnut, and, with the exception of a solitary gland the size of a nutmeg at the apex of the axilla, this region is free of glands.—I am, etc.

Edinburgh

I. DOUGLAS BROWN, M.D.

### Metatarsalgia

SIR—In these days when millions of men and women are standing and walking more than they ever did before, the treatment of such a disabling complaint as metatarsalgia is of great importance. So far as standard works of medicine are "surgery" go, the teaching on aetiology and treatment has not changed materially in the last twenty years. The condition is supposed to be due to a neuritis of the digital nerves brought about by their being rendered vulnerable to pressure through the collapse of the anterior transverse arch of the foot.

Treatment is directed towards strengthening the muscles that are supposed to brace the transverse arch of the foot, strapping and taping the metatarsals for the same purpose or by a metatarsal bar which carries the weight further back. All who have had to employ these methods must have found them singularly ineffective. The reason for this is that the existence of an anterior transverse arch of the foot is a piece of anatomical fiction, based on the study of compressed and distorted shoes. It is not apparent in young children, nor, indeed, in any adult who habitually goes about in shoes. Study of the foot and method of walking of the barefooted African brings to light the following points:

(1) The foot at the line of the heads of the metatarsals is flat in pronation.

(2) All the toes are capable of doing plantar flexion so that the knuckles stand out prominently. This is most marked in the hallux, and is only slightly less so in the 2nd, 3rd, and 4th toes.

(3) In walking the foot does not passively roll forward on the metatarsal pad, but, as the body passes the vertical, the toes flex strongly, taking much of the weight off the metatarsals so that the pad which bears the thrust of the stride includes the pads of all the toes, particularly the 1st, 2nd, and 3rd, as well as the metatarsal pad.

(4) A study of the tracks of a barefooted walker in soft ground shows by the deep impression of the toes how strongly they engage in the act of thrusting the body forward.

In every case of metatarsalgia that I have examined, plantar flexion of the toes is absent or greatly diminished. When the condition is unilateral the power of flexion on the sound side is always markedly greater than on the affected side. When a step is taken off the affected foot the whole thrust of the stride is borne by the metatarsal heads and the overlying pad. It is not surprising that the nerves suffer from pressure, particularly as the weighted foot rolls forward on the metatarsal heads, contributing a grinding action to the weight effect. As in all foot deformities, the tolerance of the individual to an abnormal state differs widely, so that metatarsalgia appears in one individual when the condition is only slightly developed, while another will tolerate a much greater degree of deformity.

**Treatment.**—From what has already been said it will be clear that the treatment of metatarsalgia should be directed towards recovering the power of flexion in the toes and towards re-education in the proper use of the toes in walking. (1) The patient should be directed to plantar-flex his toes repeatedly at the metatarsal heads in such a manner that the heads are lifted clear of the ground; this simple exercise can and should be done at any odd moment such as when standing waiting for a bus. (2) He should be instructed to kick off with his toes at each stride and not let the toes bend up passively; this has to be done consciously at first, but becomes a habit later. The metatarsal bar is contraindicated because it leaves



the toes more helpless than ever, and other pads and straps have a similar adverse effect. Fortunately it is possible for the toes to recover their mobility after a great many years, and I have had successes in cases of 10 and 15 years' standing where the patient was intelligent and persistent.

I have no doubt that I shall be accused of over-simplifying this problem, and of failing to take into account the factor of the short and mobile first metatarsal (J. D. Morton, 1935); but here I am concerned only with aetiology in its relation to treatment, and treatment based on this simple aetiology works.—I am, etc.,

Luanshya, N. Rhodesia.

A. C. FISHER, M.D., F.R.C.S.

### The Colonial Medical Service

SIR.—I have read with appreciation the spirited reply of Dr. J. B. Davey (May 6, p. 636) to the uncomplimentary and unwarranted statement made by Dr. H. B. Morgan in the House of Commons on the Colonial Medical Service. Coming at such a time, when a large proportion of its members are, or have been, serving their country and our cause, these accusations would seem singularly ill-timed and inappropriate. Several, like those fine investigators Dr. E. C. Smith of Lagos and Dr. N. A. Dyce Sharp, have lost their lives by enemy action, and many others have been maimed in health as the result of this war. I myself feel such accusation keenly, for both my sons entered for this career and subsequently saw service in East Africa and Abyssinia. Perhaps it is not generally appreciated that Sir Patrick Manson played a great part in the development of the Colonial Medical Service, and took justifiable pride in its achievements. The medical world well knows that his great discoveries in tropical medicine some forty years ago were made with the willing co-operation of Dr. Ozzard, Dr. C. W. Daniels, and the late Sir Thomas Stanton, all of whom were members of this service.

More recent achievements in the field of medical science deserve mention: the pioneer work of Dyce Sharp in Nigeria on the transmission of the filaria (*Acanthocheilonea perstans*) through the minute midge *Culicoides*; the self-sacrifice of J. F. Corson in experiments during which he inoculated himself more than once with the deadly *Trypanosoma rhodesiense* in Tanganyika; the entirely British work on the control of sleeping sickness in West and East Africa from the time of Sir David Bruce onwards culminating in the large-scale preventive measures by Dr. H. M. O. Lester and Col. G. Maclean; work on the ecology of trypanosomiasis in East Africa and its relation to animals by Dr. Lyndhurst Duke; the classical researches of Drs. N. Kingsbury and R. Lewthwaite on tropical typhus in Malaya; investigations on yellow fever on the Gold Coast, which resulted in the death of Dr. W. A. Young from that dire infection in 1929. These are but a few examples among many which go to demonstrate that the Colonial Medical Service is not lacking in enthusiasm, energy, and originality. Like other medical services, it looks forward after the war to reorganization and expansion of its scientific activities, but popular attitude towards this noble service would be fortified by better-informed appreciation of Colonial policy in general. This would prove a source of satisfaction to many locally appointed medical officers and nurses, whose loyalty is unquestioned, to whom such damaging statements must be extremely baffling and discouraging.—I am, etc.,

London W 1

PHILIP MANSON-BAHR.

### Service Medicine and State Medicine

SIR.—The proposals for a State medical service before us and the possibility that an attempt may be considered to model any new civilian service on that existing in one of the Services make this lively and topical question of Service efficiency, or lack of it, of paramount importance to all sections of the profession. From recent discussions at medical gatherings, correspondence in the Press (lay and medical), and personal communications received, it is evident that widespread interest has been aroused, and it seems only just that this subject should be fairly and honestly examined from all angles. Might I therefore ask for the hospitality of your already overtaxed columns to touch briefly on some of the salient points as they appear to me.

Quite recently it has been stated that "Service patients... get better medical attention and after-care than do individuals even in peacetime." Doubtless a controversial statement, immediately open to criticism, but cannot be fully examined here. It would seem fair, however, to say that after almost five years of war the standard should at least be equal to that found in civil practice. In fact, if it was not so, surely it would be a grave reflection on the efficiency of our civil medical practitioners, who, after all, as civilians in uniform, now constitute the greater part of the personnel of the three fighting medical Services, and, further, many of these to-day hold some of the key administrative posts in these Services. Since the outbreak of war the Services have acquired the necessary equipment, and now also possess the administrative organization, but those of us who have spent some time in uniform know only too well how initiative and ambition are cramped and how the regular officer with his acquired "Service mind" is decried. Many now serving will be only too glad when they can return to civil practice. On the other hand, there are quite a number of both junior and senior officers who will prefer to return to some form of State service run on military lines, in which they can, for a time at least, find a haven of rest with freedom from care and want.

Certain officers in the R.A.F. Medical Service have found it necessary to repudiate criticism of efficiency in the Services as presented in the Press, and at some length have defended what they appear to regard as the Utopia of medical organization. To those who may not agree (and there are many) the inference is that they should stand aside and remain outside the new State service when it arrives. Now this view may have a large measure of truth in it regarding conditions to-day, but for my present purpose I cannot fully analyse it here. Personally I have the highest respect for the present direction of the R.A.F. Medical Service, and acknowledge the high qualities of the new Director-General, his abilities of organization and administration, with that laudable quality of approachability that has been extended to even the most junior ranks in the Service when some suggestion or criticism receives sympathetic consideration. Nevertheless, there must have been a great reversal of policy, planning, and thinking within recent times, since the policy of a few years ago in the R.A.F. was, "No more specialists in the R.A.F." It is common knowledge that certain officers have preferred to leave this Service on a variety of pretexts and return to civil life during the present war.

As one of those who voluntarily resigned from this Service after some months of duty I have first-hand knowledge of some of the inconsistencies and misdirection of talent that existed at that time, and it seems proper at such a time as the present that these irregularities should be made known, so that a balanced opinion concerning Service organization can be reached. Chief of the anomalies was that as consultant radiologist and specialist in radiology (in uniform) I was detailed to sit on medical boards as president or as a member to assess other people's diagnoses, including that of senior consultants and surgeons. There was no real shortage of general medical officers at that time, nor lack of x-ray investigations, but the latter had to be deferred until after board duty time. It was even suggested that the administration of anaesthetics came within the province of the radiologist, and some had to be given, but when warned of the possibility of performing an appendix operation the authorities were informed quite firmly that "all the wild horses," etc., would never induce even a radiologist to adopt such homicidal procedure. My original recommendations for the introduction of mass miniature radiography into the Service in 1939 were only just saved from the pigeon-hole by the timely gift of a motor mobile mass radiographic unit (the first in the country) from the British Red Cross.

Therefore it would appear highly important when we are thinking in terms of a new comprehensive medical service that those who were responsible for such chaos of administration and misdirection (some now retired) as I have touched upon are never allowed to drift on to such committees as the proposed Central or Local Health Services Councils, Joint Authority, or other bodies. Further, it becomes equally important that the Minister of Health shall not have the sole right

in the selection of his entire personnel for these committees, but that the voice of the doctor, consultant, and specialist must be heard and the profession seek the right to nominate and elect at least half or more of the members who shall serve on these committees.—I am, etc.,

London, W.1.

NORMAN P. HENDERSON

### Work of M.R.C. Committees

SIR.—The excellent account of the work of the Therapeutic Trials Committee of the Medical Research Council which is given in the current number of the *British Medical Bulletin* by a member of the staff of the M.R.C. arouses some important reflexions. First, it is not so clearly admitted, as would be both generous and relevant, that in this country drugs have been accurately tested by doctors and others for centuries before the Therapeutic Trials Committee was instituted, recent examples being the value of insulin, of liver extract, and of antipneumococcal serum, so far as their use in this country is concerned. Perhaps it is this bashful attitude towards the work of other people that is the cause of the misleading sentence with which the *Times* (May 11) commenced its leading article on this matter. "In this country," says the *Times*, "machinery for establishing, independently of the manufacturers, that a drug is free from danger and effective for the purpose for which it is designed has only been set up within recent years." Machinery in the form of semi-Governmental committees may have been lacking, but very good means for the same end were most demonstrably not, and the real advantages of the new machinery must not hide from us some of the risks which have already (though perhaps unknown to its historian) come to light.

For example, in an unofficial correspondence with a senior medical administrator it was stated to me that certain instructions on treatment were issued to doctors on the authority of a committee of the M.R.C. In replying to this dangerous form of excuse I stated that "findings of the M.R.C. committees can have no more authority than is given to them after they have been compared with all other sources of information available to the profession." The committee concerned was not the Therapeutic Trials Committee, but this shows the danger that exists of bureaucrats using committees of the M.R.C. as supports for what they want to do or obstructions to what they want to prevent. It would help to preserve the well-merited high reputation of the M.R.C. if it would tell the profession that it will welcome exposure of any effort to misuse its reports in such a way.

Another way in which committees of the M.R.C. can unintentionally do harm is if it becomes the habit, in subjects which they are known to be studying, "to leave it to the M.R.C." Groups of people who work together by written correspondence and occasional meetings, as members of such committees do, frequently miss the side-turnings in a subject that lead to new territory, and for this reason alone it should be very clearly acted upon that the M.R.C. adds to the effort for studying any subject, but its activities do not restrict the right of any other person to work on the same subject in any way available.

My contention, then, is that the M.R.C. committees can remain the useful and respected bodies that they are so long as there is no risk of their acquiring exclusiveness or of their results being misused by medical administrators.—I am, etc.,

London, W.1.

J. M. ALSTON

### Dental Hygienists

SIR.—In an article of mine in another journal, ("Teeth and Indigestion," *Practitioner*, April, 1944) I advocated the use of dental hygienists as an integral part of an efficient dental service. In this article I referred to the successful scheme of dental hygiene now being carried on in the Royal Air Force as well as to my part in an attempt to introduce this service in civil (charitable) practice in 1929. My remarks have brought many inquiries respecting the training of dental hygienists, their uses, and the objections to them. I wonder if you could possibly find space for the replies to some of these questions?

1. Dental hygienists (in comparatively small numbers, however) have been used in the U.S.A. for many years in private as well as

public health practice. They were recommended as indispensable by Fones as long ago as 1905. I have no record of their having been used in Great Britain or other European countries.

2. The Dentists Act of 1921 permits the employment of dental nurses for giving minor dental treatment in the public services, but forbids it in private practice.

3. Board of Education Circular No. 1279, 1922, prescribes how such dental nurses shall be used in the school dental service.

4. In 1930, upon the assumption that the term dental nurse might properly be regarded to include women trained essentially for administering prophylactic treatment—i.e., scaling, polishing, and examining for caries—and for instruction in oral hygiene, a dozen women were trained in University College Dental School, according to a syllabus which was drawn up for the purpose. The course occupied one year, and those who finished were employed in one or another form of public service.

5. So much objection was raised by dental practitioners, who feared that without more defined control there was a risk that unqualified dental practice might again creep in, that no further hygienists were trained.

6. A more selfish objection still sometimes voiced by uninformed members of the dental profession that dental hygienists would take away their practice is silly and untenable. For 16 years I have employed as hygienist in my private practice a qualified woman dental surgeon (as by law I cannot use anyone not fully qualified). I can only say that far from taking practice away she has invariably kept me very busy, while at the same time taking over a good deal of straightforward cleaning which many patients regard as somewhat minor in degree, though of recognized importance.

7. The experience of every busy dental practitioner is that his time is totally absorbed in fillings, extractions, and other major work, and that he has very little time left for prophylactic attention. Furthermore, the public generally is not yet sufficiently educated in preventive medicine to be willing to pay for advice only. "He did nothing, he only talked," is often the discouraging dismissal of invaluable instruction.

8. Those competent to judge suggest that in civil life, and in the case of women not previously experienced in dental work, one year or even eighteen months would be required for the training, especially if the hygienists were required for the care of children, thereby necessitating adequate instruction in diet and nutrition.

9. The present grave shortage of dental practitioners has given an opportunity for the Royal Air Force as I have explained in my article, to test the value of hygienists in their already very efficient dental service. Great credit is due to the Director-General of Medical Services, the Director of Dental Services, the Consulting Dental Surgeon, and the other dental officers who have made this successful experiment, which has now been in practice for the past 18 months and is being extended.

10. Everyone who has seen these hygienists giving treatment and instruction has been greatly impressed with the assured touch, the astonishing results of the technique, and the wisdom of the advice which they give to their patients.—I am, etc.,

London, W.1.

C. BOWDLER HENRY.

## Obituary

NORMAN HOWARD PIKE, who died at 6, Charlton Park Gate, Cheltenham, on Mar. 12, was consulting ophthalmic surgeon to the Herefordshire General Hospital, the Cheltenham Children's Hospital, and the eye department of the Cheltenham General and Eye Hospital, and was educated at Dulwich College and Guy's Hospital. He graduated M.B., B.S. in 1896 with honours in medicine and obstetrics, and then held the posts of house-physician and obstetric resident at Guy's. For ten years he was in general practice at Heckmondwike in Yorkshire, but as his interest in ophthalmic and oto-laryngological cases increased he gave it up and went to Vienna to work under Prof. Urbantschitsch in his clinic. On his return he was appointed surgeon to the eye, ear, nose and throat department of the Cheltenham General Hospital and continued so until he retired in 1942. He was a member of the B.M.A. for nearly 45 years. He was very much liked and respected by his colleagues, who regarded him as a most efficient and conscientious consultant whose advice could be relied upon: no operation, they knew, would be advised by him unless it was in the real interest of the patient, for medical men had become somewhat suspicious that the prevailing practice of wholesale tonsillectomies had not on the whole produced the results promised. Extremely careful in his examination he had a fine judgment and was a neat and deft operator. Always gentle and considerate in his treatment of hospital patients he was greatly missed by them when he retired. He had a pawky humour, with a Pikeian flavour of its own.

which was much appreciated by his friends. His favourite recreations were golf and cricket. He leaves a widow, two sons, and three daughters to mourn his loss; one of his sons is Cmdr B. Pike, R.N.

Dr. JOHN ARCHIBALD VALENTINE of Southsea, who died on March 27 aged 70, was consulting ophthalmic surgeon to the Portsmouth and Southern Counties Eye and Ear Hospital. Educated at Trinity College, Dublin, he had a brilliant career in classics and in medicine, and after taking his B.A., graduated M.B., B.Ch., B.A.O. in 1902, later proceeding to the M.D. and gaining the Cambridge diploma in tropical medicine and hygiene. For many years he was medical officer to tea plantations in India, where he acquired an intimate knowledge of tropical medicine and of ophthalmic work. In the last war he served with the R.A.M.C. in Salonika, and after the armistice returned to Southsea to devote himself solely to ophthalmology; he was on the visiting staffs of all the local hospitals as well as the Royal West Sussex Hospital, Chichester, and the Alexandra Hospital, Cosham, under the Ministry of Pensions. At the Annual Meeting of the B.M.A. at Portsmouth in 1923 he was secretary of the Section of Ophthalmology. His junior partner was mobilized in the R.N.V.R. on the outbreak of this war, and owing to the shortage of ophthalmic surgeons in the Portsmouth area Dr. Valentine immediately resumed full duty, and was in active practice till a few hours before his death. He had a wide knowledge of men and affairs. Outside his family and his professional work the great love of his life was sailing, and at the time of his death he was vice-commodore of the Portsmouth Sailing Club and rear-commodore of the Royal Portsmouth Corinthian Yacht Club. He is survived by his wife, the daughter of a well-known Dublin medical teacher, Prof. Walter Smith, and by two daughters. In the words of a colleague: "By the death of 'Archie' Valentine Portsmouth has lost a skilful ophthalmic surgeon and the medical profession a most valuable friend and colleague. . . . To those who knew him intimately the outstanding feature of his character was courage, at no time more marked than when he lost his only son near the end of a promising career at Sherborne."

News has just been received of the death in Singapore, in December last, of CUTHBERT STANLEY. Stanley joined the medical school of St. Thomas's Hospital in 1921 and qualified five years later, graduating M.B., B.S.Lond. in 1928. His early interest in ophthalmology he never lost, and he held the posts of ophthalmic house-surgeon at his parent hospital and at Moorfields. Following on a decision to work abroad he took the D.T.M.&H. and joined the Malayan Medical Service, in which from all accounts he served with considerable distinction. Stanley was always of a most cheery disposition. His heart was in his work, but he never would give himself credit for any good he might have done. He was a good doctor for he understood his patients, and it is typical of him that we heard that of his own free will he elected to stay behind to look after his sick countrymen rather than to try to make his escape. His many friends will lament his going.—A. J. W.

News has reached his daughter in this country, through the Red Cross, of the death in April, 1944, of Dr. FRANÇOIS CALOT at his home in France, Château de Miramont, par Pierrefitte-Nestalas, Hautes-Pyrénées, aged 82. Dr. Calot was a leading figure in the world of orthopaedic surgery and for many years carried on his work in hospitals at No. 69, Quai d'Orsay, Paris, and at Berck-Plage, Pas de Calais. His famous book *Orthopédie Indispensable* was translated into English by H. A. Robinson under the title *Indispensable Orthopaedics*, and ran into several editions.

## The Services

### CASUALTIES IN THE MEDICAL SERVICES

Wounded.—Major R. P. Howard, R.C.A.M.C.

Died of wounds in Burma.—Capt. C. J. Gannon, R.A.M.C.

### DEATHS IN THE SERVICES

Wing-Comdr. GEORGE WILLIAM PATON died on April 24, aged 43. He studied medicine at Liverpool University and qualified M.B., B.Ch. in 1926. After holding house posts at the Northern Hospital, Liverpool, he was appointed to a commission in the Medical Branch of the Royal Air Force on Oct. 2, 1928. He was serving as deputy principal medical officer (hygiene) at an R.A.F. headquarters overseas.

## Medical Notes in Parliament

### Vitamins to Occupied Europe

On May 9 Mr. HARVEY asked the Parliamentary Secretary to the Ministry of Economic Warfare whether the additional vitamins, for which permission had been given by the Allied authorities, were now reaching the civilian sufferers in the countries occupied by Germany. Mr. FOOT said that the first consignment of vitamin D preparations, the gift of the British and the Dominions Red Cross Societies, was now on its way to Geneva.

On the same day Mr. FOOT informed Mr. Hutchinson that he had considered the copy of a resolution, passed by a number of ministers of the Free Churches in Ilford, urging the Government to reconsider their policy concerning the supply of limited quantities of vitamins and milk concentrate for children and nursing mothers in certain countries, subject to the requisit assurances on control being obtainable. While the Government had every sympathy with the desire to relieve distress in enemy occupied countries, they remained of opinion that the advantage, direct or indirect, which the enemy would derive from any relaxation of the blockade would outweigh the advantage to our friends. Moreover, there would in the near future be strong operational objections to projects of this kind.

### Malaria Control Measures in West Africa

In the House of Lords on May 16 the DUKE OF DEVONSHIRE informed Lord Teviot that the prosecution of antimalarial work was constantly being undertaken by the West African Governments, but war conditions necessarily involved a substantial reinforcement of this work, particularly in regard to shipping and Service personnel. At the request of the Colonial Secretary, Prof. Blacklock, of the Liverpool School of Tropical Medicine, visited Freetown in 1940 to examine and advise generally on the adequacy of the antimalarial measures being undertaken there. The Liverpool School had a special interest in this work, and at one time Prof. Blacklock was in charge of the Sir Alfred Jones Research Laboratory at Freetown. He reported to the Colonial Secretary in 1941, but many of the recommendations he then made had already been acted upon. Prof. Blacklock had recently returned from a second visit to West Africa, where he had again surveyed the antimalarial measures in progress, and had examined the work which had been carried out since his previous visit. Although it had not yet been possible for him to submit a report he was understood to be satisfied that a great deal had been done by both the civil and military authorities, and that the position in regard to the occurrence of malaria had much improved. Dr. Bruce Wilson, of the Rockefeller Foundation, was also at present visiting West Africa, and would be given every opportunity of seeing and commenting on the antimalarial measures in force there in the light of his own experience as chief officer in the Foundation's recent campaign in Brazil to eliminate the anopheles mosquito, which was also the predominant species in West Africa. For nearly two years a special investigation, financed by a grant from United Kingdom funds, had been proceeding in regard to this mosquito in British Tropical Africa, with particular reference to methods of control.

**Experiments on Animals.**—Mr. HERBERT MORRISON, replying to Mr. Viant on May 9, said that the published return for 1939 showed that the total number of experiments performed on living animals in that year was 954,691. A large number were almost wholly simple inoculations and similar procedures performed either on behalf of official bodies with a view to the preservation of the public health or directly for the diagnosis and treatment of disease. The figures for the next three years were: 1940, 889,677; 1941, 764,013; and 1942, 932,448. The figures for 1943 were not yet available.

**Drug and Vaccine Needs of India.**—On May 11 Mr. AMERY stated that India produced her own requirements of cholera and typhoid vaccine. Between Nov. 1, 1943, and April 1, 1944, 6,900,000 cholera inoculations were given in Bengal. All demands of the Government of India for mepacrine, sulphonamides, and emetine for civil purposes had been met. Mepacrine was used in hospitals and dispensaries, releasing quinine for general use. Sulphonamides and emetine were similarly available in hospitals and dispensaries. Prices measures had been taken to deal with

**Silicosis Medical Board Examinations.**—Mr. HERBERT MORRISON said on May 11 that applications from miners in West Wales to the Silicosis Medical Board for certificates between Jan. 1, 1943, and April 30, 1944, were 2,440. The number of certificates issued was 625 and of those refused 663. At the end of April 1,152 cases

awaited examination or decision. Everything was done by the staff of the Medical Board to deal with cases expeditiously, but the claims on the medical profession at present made it very difficult to secure qualified men who could devote time to this work.

**Smallpox Vaccination in Dorset.**—On May 16 Mr. LEACH asked the Minister of Health whether he was aware that people in the Sherborne and other areas of Dorset had suffered from vaccination urged on the public by medical officials in consequence of the alleged case of smallpox, the diagnosis of which had not been confirmed; and whether he would issue to all medical officers of health a copy of his statement of policy under which he had recommended that school children and young adults should not be primarily vaccinated unless they had been in personal contact with virulent smallpox. Mr. WILLINK replied that he was aware that persons who were vaccinated did not in all cases escape ill effects; but he could not adopt the suggestion in the second part of the question. The statement to which Mr. LEACH referred, contained in a circular issued to qualified the recommendation alluded to smallpox prevalent in this country retains which did not apply to the most recent.

Mr. LEACH also asked the date on which reported to be suffering from smallpox entered hospital; whether she was still there and, if not, the date on which she left the hospital; how long she had spots before the investigation was made; how many doctors were engaged in the investigation; whether they made the diagnosis of smallpox which was not confirmed; and whether doctors from his Ministry examined the case. Mr. WILLINK said that the patient was admitted to hospital on April 1, and was discharged on April 20. She had spots on March 28 but was not able to visit her doctor until two days later. Nine doctors were concerned in the investigation of the case, including three of his medical officers. The opinion reached by six of them that it was a case of smallpox was not shared by two of his officers; but the precaution was taken of treating it as a case of smallpox. Occasionally the diagnosis of smallpox presented great difficulties and there was ample room for differences of medical opinion. At least three of the local doctors who judged this case to be one of smallpox were practitioners with substantial experience of the disease.

#### Notes in Brief

Mr. Willink stated in the House of Commons on April 18 that 16,319 doctors were under agreement with the insurance committees in England and Wales on January 1 last.

The Medical Research Council, to which Mr. Willink referred the claim made for "H 11" in the treatment of cancer, takes the view that as this preparation has been available to the medical profession and has been widely tried no action on its part is necessary.

Dr. C. H. Hampshire has been added to the members of the Penicillin Clinical Trials Committee appointed by the Medical Research Council.

In the first 12 weeks of this year approximately 13,350 cases of tuberculosis were notified in England and Wales. Figures for equivalent periods in 1943 and 1942 were approximately 13,000 and 12,100.

Mr. Churchill states that since Oct. 1941, £3,047,725 has been spent through British charitable organizations on surgical and medical items for Russia and on clothing. The public has contributed some of the funds for these supplies. In addition His Majesty's Government has made a grant of £2,500,000 for clothing.

It is estimated that about 30% of the population of rural districts live in houses which are not connected to or within easy access of a water main.

Mr. Johnston has stated that he does not intend to introduce legislation to amend the Milk and Dairies (Scotland) Act, 1914. He is satisfied with the present legislation under the Act.

## Medical News

The following have been elected Honorary Fellows of the Royal Society of Medicine: Prof. E. D. Adrian, O.M., F.R.S., Sir Farquhar Buzzard, and Sir Walter Langdon-Brown (Great Britain); Major-General Paul Hawley, Col. J. C. Kimbrough, Col. Elliott C. Cutler, Prof. E. B. Krumbhaar, and Dr. D. P. O'Brien (U.S.A.); Sir Ali Ibrahim Pasha, Hon. F.R.C.S. (Egypt); Médecin Général Inspecteur Adolphe Sicé (France); and Col. Johan Holst (Norway).

Prof. L. P. Garrod will give a lecture, arranged by the Polish Medical Association in the United Kingdom, on "The Principles of Modern Chemotherapy, with Special Reference to Penicillin" on Tuesday, May 30, at 5 p.m. at B.M.A. House. Visitors, including senior students of all London medical schools, will be welcome. The lecture will be followed by a discussion.

At the Royal Institution, 21, Albemarle Street, W., on June 2, at 5 p.m., Sir J. C. Drummond, D.Sc., F.R.S., will give a Friday evening discourse on the Hot Springs Conference and its bearing on nutrition in Great Britain.

The British Institute of Philosophy announces that Prof. H. H. Price (Wykeham professor of logic in the University of Oxford) will give a lecture entitled "Two Theories of Perception" at University Hall, 14, Gordon Square, London, W.C., on Friday, June 2, at 5 p.m. Cards of admission may be obtained free of charge from the Director of Studies at University Hall.

Prof. R. J. A. Berry, M.D., F.R.S.E., is to address the Royal Society of Edinburgh on Monday, June 5, on "Some Recent Advances in the Study of the Brain as the Implement of Mind."

The Harveian Lecture will be delivered before the Harveian Society of London on Monday, June 5, at 4 p.m., at the Royal College of Surgeons, Lincoln's Inn Fields, by Surgeon Vice-Admiral Sir Sheldon Dudley, Medical Director-General of the Navy. His subject is "State Medical Service Problems in the Light of Royal Naval Experience."

At the next meeting of the History of Medicine Section of the Royal Society of Medicine, on Wednesday, June 7, at 2.30 p.m., the following will speak: (1) Sir Arthur MacNalty, paper on "Edward Bancroft, M.D., F.R.S., and the War of American Independence"; (2) Dr. H. P. Bayon, note on "John Zephaniah Holwell (1711-98) and the Black Hole of Calcutta."

By arrangement with the University of Cambridge the Medical Research Council has established a Unit for Research in Applied Psychology at Cambridge. The unit is located in the University Psychological Laboratory, the head of which is Prof. F. C. Bartlett, F.R.S. Dr. K. J. W. Craik has been appointed to the Council's staff as director of the unit, and will have the collaboration or assistance of other workers there in the Council's service. The members of the unit will undertake work elsewhere than at Cambridge when required, including investigations within the field of the Council's Industrial Health Research Board.

Dr. Robert Ellis, who for three years has been vice-chairman of the Cambridgeshire County Council, has recently been elected chairman. Dr. Ellis has been chairman of the Cambridgeshire Insurance Committee, and from 1939-43 was president of the Cambridgeshire and Hunts Branch of the B.M.A.

Dr. Mary S. Stuart has been mentioned in dispatches in recognition of gallant and distinguished services in the Middle East.

The Pharmaceutical Society of Great Britain announces that five pharmaceutical manufacturers have each agreed to give scholarships to enable pharmaceutical graduates from China to take a two-years course at the University of London. They would then return to China to help to train the 50,000 pharmacists whom General Chiang Kai-shek requires for his ten-year plan for public health services. The donors of the scholarships are Allen and Hanburys Ltd., London; Boots Pure Drug Co. Ltd., Nottingham; Evans Sons Lescher and Webb Ltd., Speke, Liverpool; The Wellcome Foundation Ltd., London; and May and Baker Ltd., Dagenham. The idea of the scholarships was brought to this country by Mr. A. H. Bentley, son of the Mayor of Bolton, a pharmacist who escaped from the Japanese in Hong Kong. It is expected that the cost of each scholarship will be £1,400.

Nurses and domestic workers are to be medically examined before taking up duties in a tuberculosis institution, and generally the examination will be carried out by the staff of the M.O.H. for the area in which the candidate is living at the time. It will be a full clinical examination and include x-ray investigation and a Mantoux or similar tuberculin test. If there is any medical reason why the candidate should not be employed in a sanatorium the Ministry of Labour officer concerned will be informed. (Ministry of Health Circular 33/44.)

## Universities and Colleges

### UNIVERSITY OF CAMBRIDGE

As announced in a note in the adjoining column, the Medical Research Council has offered to establish a Research Unit in Applied Psychology in the University Department of Experimental Psychology. The department will benefit greatly from the establishment of such a research unit, and on the proposal of the Council of the Senate the Vice-Chancellor has been authorized to convey the thanks of the University to the Medical Research Council.

### ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At a meeting of the President and Fellows of the College held on May 5 the following Members were elected Fellows of the College: T. D. O'C. Donelan, J. G. Gallagher, W. J. E. Jessop, J. K. McCollum, C. F. McConn, E. B. McEntee, M. J. O'Neill, Agnes Savill, S. Simms, R. C. Sutton.

A clinical meeting of the Whipp's Cross Hospital Medical Society was held at the hospital on May 12. After Dr. Goodhart and Dr. Sutton had read papers on diabetic coma and on appendicitis, Dr. Joseph presented seven cases to show the excellent results obtained by his modification of the Hey Groves operation for intracapsular fracture of the femoral neck. The patients were all between 65 and 75 years of age, and as a result of the operation showed no disability whatever. Dr. Joseph also demonstrated a case of burns due to methyl bromide vapour, and Dr. Sharp and Dr. Blond respectively showed cases of tabetic gastric crises and (?) blastomycosis improved by intensive potassium iodide therapy. Some 60 local doctors attended the meeting. At the next meeting, on Friday, June 2, at 8.30 p.m., Prof. S. P. Bedson, F.R.S., will address the Society on "Some Recent Work on Viruses."

The Central Midwives Board has re-elected Sir Comyns Berkeley as its chairman for the year ending March 31, 1945.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In England and Wales during the week notifications of scarlet fever fell by 118, and those of diphtheria by 80. Dysentery notifications rose by 41.

Scarlet fever was less prevalent everywhere except in the Midlands. Yorks West Riding reported 58 fewer cases than last week. The figures for diphtheria were the lowest since last August. Whooping-cough notifications were 35 more than last week, the total being the highest for a twelvemonth. Although Hertfordshire reported a rise of 31 over last week's total, Yorks West Riding and Derbyshire had respectively 29 and 28 cases fewer. The notifications of measles were 20 fewer than in the preceding week, the total for the Isle of Wight mounting by 74. Kent and Durham, on the other hand, each reported 44 fewer cases.

For the fourth successive week there was a rise in the notifications of dysentery. The most important of the outbreaks were Shropshire, Atcham R.D. 45; Cumberland, Penrith U.D. 25; Derbyshire, Heanor U.D. 22; Northumberland, Newcastle-upon-Tyne C.B. 13; Warwickshire, Birmingham C.B. 11. There were 30 cases in London (Wandsworth 14), and 22 in Lancashire.

In Scotland measles notifications dropped by 105, those of whooping-cough by 54, and those of scarlet fever by 22. The total cases of dysentery were 12 higher than last week, and those of diphtheria 8. Argyll County reported 31 cases of this disease, and the cities of Edinburgh 20, and Glasgow 14.

In Eire the notifications of measles rose by 52 cases. The largest returns were Dublin C.B. 54; Dublin, Rathdown No. 1 R.D. 41; Cork C.B. 37; Waterford C.B. 34. Measles and whooping-cough are both said to be prevalent in Roscommon, but no figures are given.

In Northern Ireland scarlet fever notifications showed a rise of 16 over last week's total; 36 of the 82 cases were notified in Belfast C.B.

### Week Ending May 13

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,791, whooping-cough 2,548, diphtheria 584, measles 2,132, acute pneumonia 704, cerebrospinal fever 70, dysentery 280, paratyphoid 10, typhoid 8. One case of smallpox (a woman) was notified in Cheshire, Birkenhead C.B.

### Tuberculosis in America

The report issued by the New York Tuberculosis and Health Association shows that, despite a year of war, an improvement was registered in tuberculosis mortality in America between 1941 and 1942. The deaths in 1942 were 57,002, compared with 59,251 in 1941, and the equivalent death rates per 100,000 were 43.5 and 44.5. It will be remembered that in England and Wales a rise in tuberculosis followed the outbreak of war, the numbers of deaths for the years 1938-41 being 25,539, 25,623, 28,151, 28,667. The corresponding figures for Scotland were 3,432, 3,526, 4,003, 4,174. In New York City the death rate fell from 49.4 per 100,000 in 1941 to 46.2 in 1942, but there was an increase in incidence—9,834 new cases of tuberculosis were registered in 1942, compared with 9,222 in 1941. A gradual rise in notifications has occurred in England and Wales during the war, and both in America and in this country the upward trend is partly due to the earlier discovery of the disease by radiography. The coloured population of New York City had a mortality five times as high as the white population; the rates for 1942 were 194 and 42 per 100,000 respectively. The death rates in 1942 for the other American cities with a population of over a million were Detroit 45.0, Chicago 49.2, Los Angeles 54.4, Philadelphia 58.7, the differences from the 1941 rates being +3.8, -4.1, +0.2, +0.3, respectively.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 6.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	72	6	25	2	1	61	2	32	5	1
Deaths .. ..	2	—	—	—	—	—	—	3	—	—
Diphtheria .. ..	548	25	171	85	22	643	35	154	70	20
Deaths .. ..	12	2	1	1	—	12	—	2	4	—
Dysentery .. ..	259	30	91	—	—	193	11	36	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	4	—	1	—	—	2	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	35	7	2	—	1	40	10	2
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	7	—	—	—	—	46	—
Deaths .. ..	36	8	9	10	4	45	3	7	11	5
Measles .. ..	2,035	213	454	266	11	10,090	605	657	42	88
Deaths .. ..	2	—	1	1	—	7	—	1	—	1
Ophthalmia neonatorum .. ..	98	3	23	—	—	101	9	14	1	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever ..	4	1	14(B)	2(B)	—	7	—	—	—	—
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenzal* ..	680	49	2	4	2	745	9	12	4	2
Deaths (from influenza) ..	13	1	1	1	—	15	1	1	—	—
Pneumonia, primary ..	—	—	198	26	8	—	27	189	21	7
Deaths .. ..	27	—	10	—	—	—	—	11	—	—
Polio-encephalitis, acute ..	2	—	—	—	—	1	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Poliomyelitis, acute ..	12	1	1	—	—	3	—	1	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	3	18	—	—	—	1	11	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† ..	151	11	12	1	3	138	11	14	2	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,646	115	191	25	82	1,458	137	226	32	37
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	5	—	3	19	2	12	2	10	9	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,432	249	187	43	13	2,225	142	350	31	28
Deaths .. ..	16	5	1	2	1	16	2	3	—	1
Deaths (0-1 year) ..	359	47	66	37	24	341	46	64	29	22
Infant mortality rate (per 1,000 live births) ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) ..	4,233	635	571	183	133	4,261	623	590	205	127
Annual death rate (per 1,000 persons living) ..	—	—	13.1	11.9	—	—	13.3	13.5	—	—
Live births .. ..	7,211	869	1,002	563	294	6,887	802	982	390	320
Annual rate per 1,000 persons living ..	—	—	20.4	—	—	—	20.0	25.6	—	—
Stillbirths .. ..	234	26	32	—	—	221	20	34	—	—
Rate per 1,000 total births (including stillborn) ..	—	—	31	—	—	—	—	33	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.



## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Anaesthesia*. *Westcent*, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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### ANY QUESTIONS?

#### Coitus during Pregnancy

**Q.**—Is there any scientific evidence as a basis for giving advice on the harmlessness or otherwise of intercourse during pregnancy? Is there a risk of abortion in the early and/or late months? Authors seem to disagree, or give nebulous advice obviously not based on real evidence.

**A.**—It is obvious that coitus in the later months of pregnancy carries with it the risk of introducing pyogenic organisms into the birth canal. I know of no statistics bearing on the question of the possible influence of coitus on the incidence of abortion, nor is it likely that reliable figures could be easily obtained. Most gynaecologists suppose that, although in the majority of women no harm results, in a minority coitus will, directly or indirectly, irritate the uterus and so favour abortion: this is especially so in the first three months of gestation. As one famous teacher of a previous generation used to say: "One woman will go through a railway accident and suffer no harm, while her sister will abort at the smell of a badly snuffed candle."

#### Vaginal Discharge after Delivery

**Q.**—A patient aged 25 was confined 9 months ago. Since then she has had a profuse brown vaginal discharge. The puerperium was normal save that she was unable to feed her baby on account of scanty lactation. There was no obvious cervical damage and she has no other symptoms usually associated with retained placenta and chronic endometritis, etc. She has not yet menstruated again, she has always been irregular. General health is very good. It has been suggested that this discharge is due to an endometrial upset. If so, could you suggest any possible treatment?

**A.**—This type of discharge is not very suggestive of an endocrine upset. There are several more likely causes, and infection of the endocervix, cellular tissue, or even tubes is not necessarily excluded by the history of a normal puerperium. Other possibilities are erosion of the cervix, delayed involution with or without uterine retroflexion, uterine polypus, trichomonas vaginitis, and retained products of conception. I have recently seen a similar case in which the diagnosis proved to be tuberculous endometritis. The diagnosis can be established only by investigation. Determine first whether the discharge is really brown—i.e., blood-stained—or whether it is mucoid or purulent when fresh but dries leaving a brown stain on clothing. The discharge should be examined microscopically. If bimanual examination reveals no gross abnormality, inspect the cervix and vagina, using a well-lighted speculum. If the findings are still negative, the patient should be examined under general anaesthesia, the cervix dilated, and the uterus curetted. If there is any evidence of cervical infection, treatment with diathermy or cautery can be carried out at the same time. It is important to examine microscopically all material removed from the uterus; the diagnosis may ultimately depend on this examination. If there is any endocrine disturbance the sections should help to determine its nature and the appropriate treatment.

#### Points about Trilene

**Q.**—Is nitrous oxide-oxygen-trilene a safe anaesthetic to employ when the diathermy is in use in the neighbourhood of the face as, for example, in the operation for cure of detachment of the retina? Is there any danger of decomposition of trilene when kept over a period of weeks in a coloured bottle, as, for example, in the chloroform bottle of a Boyle's apparatus, in the operating theatre? Does any change occur in trilene when nitrous oxide and oxygen are passed through it?

**A.**—Trilene and oxygen can form an explosive mixture in certain circumstances; but these conditions are never likely to arise during

the administration of an anaesthetic. Nitrous oxide-oxygen-trilene may therefore be considered a safe anaesthetic to employ when the diathermy is in use. There is no danger of decomposition of trilene when kept in a coloured bottle over a period of weeks. The decomposition so far reported has been related to trilene passing over soda-lime. Two other factors are involved. First, the soda-lime had a high content of sodium hydroxide—11.5% as against 2.5% or less in some soda-limes. This allows the formation of heat, and a temperature over 60° C. accelerates the process. Secondly, economy was exercised and the soda-lime was kept, instead of fresh material being used for each anaesthetic. This allows time for the chemical reaction to continue. No change occurs when nitrous oxide and oxygen are passed through trilene.

#### Splitting of Finger Nails

**Q.**—What is the cause of the splitting in layers of the finger nails? Suggestions for the treatment of this condition would be welcomed.

**A.**—Splitting of the finger nails is sometimes due to nail varnish or to one of the skin hazards met with in ordinary housework. It may also be met with in systemic disorders such as hypothyroidism. Not infrequently no recognizable cause can be discovered.

#### Generalized Vaccinia

**Q.**—Two days after the successful vaccination on the arm of a baby aged six weeks, several vesicles appeared on different parts of the child's body, face, fingers, penis, sole of foot, etc. These vesicles had an inflamed base, contained turbid fluid, and closely resembled the original vaccination vesicle. What is their cause? Have they any connexion with the vaccination? Are they likely to leave scars?

**A.**—Although generalized vaccinia due to systemic spread of the virus is a very rare complication of vaccination, the description given here would conform to that diagnosis. Rashes after vaccination are not so uncommon, but they usually fall into the allergic group—e.g., papular or circinate urticaria, eczematoid eruptions, and erythema multiforme. All of them may be accompanied by much constitutional upset. Secondary vaccinal lesions due to auto-inoculation or to the contaminated fingers of an attendant may also occur, particularly if the patient is already suffering from some skin disease, and it may be difficult to distinguish auto-inoculation from generalized vaccinia. However, typical lesions appearing on inaccessible parts of a healthy skin would support a diagnosis of generalized vaccinia. The rash evolves in the same way as the primary vaccinal lesion and is likely to leave small pock marks.

#### Byssinosis

**Q.**—Could you instruct me as to the clinical features of byssinosis, together with treatment and prognosis of the condition? Should a workman who has had byssinosis continue to work in a woolen mill, and what effect would this have on his compensation rights?

**A.**—Clinically the physical and radiological signs of byssinosis are identical with those that occur in chronic bronchitis with emphysema; but in a case of byssinosis there is often a very suggestive history—namely, that a man previously free from chest symptoms, after working in a card-room for a number of years, complains of cough and shortness of breath which are always most marked on Mondays and improve as the week goes on; and by the end of the week he is tolerably comfortable. At first this cycle goes on week after week, until in the later stages he is affected almost equally on all days. There is no specific treatment for the condition, but some cases are benefited by breathing exercises. A man so affected should be advised to change his occupation before he is totally incapacitated.

Compensation for byssinosis is for total disablement for any gainful occupation, but before such compensation is granted the worker must have been employed in a card-room for 20 years or more. If at the end of this period he is admittedly suffering from byssinosis, employment in some other work would not interfere with the man's future rights to compensation. It would, however, on health grounds be inadvisable for him to work in a dusty atmosphere such as might be present in certain departments of a woollen mill.

#### Oestrogens and Cancer

**Q.**—I was taught as a student that oestrogenic hormones, if administered to a case of leucoplakia vulvae, would usually aggravate the condition and might precipitate a carcinomatous change in the lesion. Assuming this to be correct, I find it difficult to understand the rationale of the treatment of mammary and prostatic carcinoma with stilboestrol. Con the fact that, whereas oestradiol is a naturally occurring substance, stilboestrol is a synthetic product have any bearing on the subject?

**A.**—Leucoplakia vulvae should not be treated with oestrogens. Though there is no definite evidence that such treatment does harm it certainly does no good and may result in a dangerous delay before proper treatment is instituted. There is no rationale at present for



the treatment of mammary carcinoma with oestrogens. In fact in susceptible strains of mice oestrogenic treatment increases the incidence of carcinoma even in males. It makes no difference whether natural or synthetic oestrogens are used. This effect can be diminished or delayed by androgenic treatment. The carcinogenic principle is conveyed in the mother's milk, the function of the oestrogens being in all probability the development of the breast to an anatomical state in which it is susceptible to the carcinogenic substance. This is a colloid of high molecular weight, perhaps a virus. Thus in mammary cancer it is probable that the role of oestrogens is not strictly carcinogenic. On the other hand it seems likely that in other organs oestrogens may be carcinogenic. Malignant tumours of the uterus have been induced in mice in which the milk factor is absent. There is no definite evidence that oestrogenic treatment has ever induced malignant disease in humans.

The rationale of the treatment of prostatic carcinoma rests in the fact that the growth occurs in that part of the prostate which enlarges under androgenic treatment and decreases under oestrogenic treatment, and that prostatic cancer tissue strongly resembles normal tissue, especially in its function of producing acid phosphatase. The growth of both normal and cancerous prostatic tissue is inhibited by oestrogens, whether natural or synthetic. It does not follow, of course, that oestrogens are of use in senile enlargement, which does not affect true prostatic tissue but is confined to tissue which is vestigially female and is therefore increased in size by oestrogens.

#### Leeches and Malaria

**Q.**—Is there any truth in the belief that leeches can act as carriers of malaria in malarial districts?

**A.**—There is no evidence even suggesting that leeches can act as carriers of malaria, and it is extremely unlikely that they should do so. There is, however, the possibility that a leech might in special circumstances transmit infection by direct inoculation. It is well known that malaria can be conveyed artificially by inoculating infected blood, and instances are known where malaria has been transmitted by the use of a common syringe when inoculating a series of individuals with a drug intravenously. It has also been recorded in the case of drug addicts using a common syringe. It is therefore just within the bounds of possibility that a leech which has fed on a malaria-infected person might by direct transmission infect a second person. A much more probable origin of the belief referred to is that where there are leeches there are likely to be anophelids, and that attacks of malaria have been ascribed to the more obvious and spectacular attacks by leeches when in reality they have been contracted in the usual manner by the bites of anophelids of which the victim has taken little note.

#### Multiple Exostoses

**Q.**—A man aged 28 has suffered from exostoses all his life. Six large ones have been removed from his femurs and feet during the last eight years, and he is slowly developing two new ones on one femur and two on one arm. Can you suggest a suitable treatment?

**A.**—In view of the fact that the underlying pathology of multiple exostoses starts in infancy, there is clearly no radical prevention possible in adult life. The exostoses must be dealt with locally if they cause trouble. At the age of 28 no further growth of any extent is likely, though calcification of pre-existing chondromata may occur.

#### A Patient's Dilemma

**Q.**—A patient aged 40 has suffered since childhood from nervous diarrhoea which almost invariably affected him when he went to church. My request for advice may sound peculiar, but my patient is soon going to get married in church, and is extremely worried about "holding out" for the duration of the ceremony. What drugs are likely to be most effective in immobilizing the gut?

**A.**—This psychoneurotic symptom, apparently almost entirely limited to occasions of church-going, could very probably be eliminated by a short course of psychotherapy. However, as time is short, if recourse must be had to drugs I suggest the following: Tinct. opii 10 minims, ext. hyoscyam. liq. 6 minims, sod. phenobarb. 1/2 gr., cret. praep. 30 gr., mucilag. tragacanth. q.s., aq. chloroform. ad half ounce. to be taken on retiring the night before the wedding and after breakfast on the day of the wedding. If the marriage is arranged for the afternoon, a further dose must be taken about one hour before going to church. The mixture may do the trick but cannot be guaranteed to combat the effects of high-grade anxiety. The subsequent depression arising from these drugs might in a neurotic man lead to impotence, which would then be perpetuated by fear. This warning is necessary, because should such an event occur the patient's wrath would be visited on the doctor. Without the phenobarbitone it is doubtful whether the other drugs would act as sufficient check, but it is quite likely that they would do so and no appreciable effect on spinal nerve reflex would be produced.

## INCOME TAX

### "Pay as you Earn"

"BETA" occasionally does locum work for his former partners and for a local practitioner.

\*\* Presumably the earnings of "Beta" are assessed under Schedule D as professional profits, and the pay-as-you-earn system would be inconvenient. It cannot be said to be legally wrong to apply it, but it is thought that in general it will not be applied to locumtenents. It might be advisable in "Beta's" case, seeing that he knows for whom he is likely to act, for him to ask the inspector of taxes to authorize the practitioners concerned not to deduct tax from him, thereby removing any doubt there may be.

### Retiring Partner's Liability

A and B are partners on an equal share basis. A is retiring from the partnership on June 30, 1944, and B is taking in an assistant. How is the income tax due on July 1, 1944, apportioned?

\*\* The tax due on July 1, 1944, is the second instalment of the tax assessed for the year to April 5, 1944. As A was a partner during the whole of that year no apportionment is due. In fact A will be liable to account, in addition, for his share of the tax in respect of the period from April 5, 1944, to June 30, 1944, but that tax will not be due to the Revenue until the January and July instalments for 1945 become payable.

## LETTERS, NOTES, ETC.

### High Birth Weights

Dr. WALTER CALVERT (Stoekport) writes: Your contributor's answer under the above heading (April 8, p. 510) is the type which invites "I can beat that" letter. I have a patient in hospital now whose twins weighed 8 lb. 4 oz. and 8 lb. at birth. Both are breast-fed and both are well above their birth weights on the 12th day.

Dr. W. M. PENNY (London) writes: Several years ago I attended a lady who had twins weighing respectively 8 lb. and 9 lb. Fortunately it was her second confinement, so the births were not difficult. The first was a vertex, the second a breech.

### A Swallowed Button

Mr. E. J. WILKINS, editor of *British Plastics*, writes: My attention has been drawn to a letter from Dr. J. A. Stevens in your issue of April 29 (p. 610) regarding the detection of a plastic button by x rays. This is a very interesting case, but I think the inference drawn by Dr. Stevens in the last two lines of his letter is entirely wrong, and that the radiographer and not the composition of the button is responsible for the valueless x-ray examination. So far as I am aware, if the x rays are adjusted correctly there is no plastics material that will not show its presence. The fault seems to be with the radiographer who, it is admitted, showed no interest in the buttons on the coat given to him by the mother. I am writing merely to correct the inference of Dr. Stevens that plastics buttons may be dangerous on babies' clothing because if they are swallowed they cannot be detected.

### The Blocked Eustachian Tube

Dr. OCTAVIA LEWIN writes: The emphasis that Dr. Hilton Brown of Edinburgh (May 6, p. 635) lays on the fact that ear troubles are mostly due to infection from the pharynx stresses the need for close attention to the Eustachian tube and the danger of letting the opening get blocked. It is the only entrance for germs, and it is normally permanently open and so ensures no interruption in the sense of hearing. The exception to this is during the act of yawning, which causes its closure, but this is never more than momentary. The common cause for Eustachian deafness is the nasal obstruction that necessitates mouth breathing. Careful attention to the nasal toilet is therefore the best preventive against ear troubles.

### Osteo-arthritis of Hip

Dr. A. GORDON WATSON (Bath) writes: Your answer in the "Any Questions?" section under the above heading (April 29, p. 608) omits the value of treatment in hot mineral-water baths, especially of the pool variety. We find at the Royal National Hospital for Rheumatic Diseases that a large percentage of working men and women (miners, navvies, housewives, etc.) return to their work, and can continue working, for a year or more without further treatment, even when the x-ray films show marked osteo-arthritis of one or both hip-joints. If the improvement is not maintained for six or eight months the patient is advised to return at once for a further course of balneological treatment, and this method suffices for the majority. In some recalcitrant cases with severe pain, deep x-ray therapy is combined with balneological treatment, and is found to be successful in relieving pain in a considerable proportion of cases. The patient is often advised to continue remedial exercises at home plus a course of iodine internally in some form or other.

LONDON SATURDAY JUNE 3 1944

## SOME PROBLEMS OF INFECTIVE HEPATITIS

BY

L. J. WITIS, M.D., F.R.C.P.

*Nuffield Professor of Clinical Medicine, University of Oxford*

We might begin by asking ourselves what justification there is for regarding infective hepatitis as an infection at all, or for using this name in place of synonyms such as simple jaundice, catarrhal jaundice, or epidemic jaundice. Certainly none of Koeh's postulates has been fulfilled, and the history of nutritional deficiencies such as ergotism and scurvy shows that epidemicity is no criterion of infection. There is, however, the well-authenticated fact that people often go down with infective hepatitis approximately a month after contact with a case—often quite a brief contact; and the transmission experiments of Voegt (1942) and Cameron (1943) are hard to explain except by some sort of virus. Nevertheless, although infective hepatitis seems to be an infection, it has not been possible to transmit it to any experimental animal in spite of numerous attempts and modifications. There are no characteristic histological lesions such as inclusion bodies, and tissue culture has given no assistance. We are unable to recognize the virus except by human transmission, and there is no laboratory test for the pre-icteric or subclinical forms of the disease. Compare the position with Weil's disease, in which there is a visible organism, an animal host, and a sensitive serological test, and in which, as a result, the frequency of non-icteric and subclinical infection has been revealed, and it will be seen under what a disadvantage we labour.

It is important to consider this question whether "catarrhal jaundice" occurring sporadically or epidemically is an infection, because jaundice sometimes occurs after the injection of human serum or plasma, or during the course of treatment of syphilis with organic compounds of arsenic. The symptoms, biochemical alterations, and morbid anatomy of this homologous serum jaundice and of post-arsenical jaundice are very similar to those of infective hepatitis. In all three illnesses there is an acute hepatitis and the microscopical picture of the liver is identical. (In parenthesis it may be added that jaundice proved to be due to catarrh of the duodenum or bile ducts is excessively rare.) Nevertheless, it is doubtful whether homologous serum jaundice and post-arsenical jaundice are infectious or contagious, or transmissible in any way except by deliberate inoculation.

The incubation period of infective hepatitis is approximately 30 days, while that of homologous serum jaundice and post-arsenical jaundice is usually 60 to 90 days. It is possible that homologous serum jaundice and post-arsenical jaundice are one and the same disease, small quantities of serum being passed from one patient to another in the syringes used for the injection of the arsenic. The incidence of post-arsenical jaundice can be greatly reduced by scrupulous precautions to prevent transfer of material from patient to patient (Salaman,

1944). It seems improbable that the virus of infective hepatitis is the factor which is transmitted in inoculation jaundice. A virus should not require a longer period of incubation with injection than with natural infection. Moreover, homologous serum jaundice does not protect the individual from contracting infective hepatitis; in fact, it appears to increase his susceptibility to this disease (Gordon, personal communication, 1944). Although second attacks of infective hepatitis do occur, they are uncommon enough to suggest that an attack of infective hepatitis itself is usually followed by the development of immunity. Finally, there is no evidence that patients with homologous serum jaundice or post-arsenical jaundice ever infect their neighbours. This is not for want of opportunity, because both diseases have occurred on an unprecedented scale during this war. On the other hand, homologous serum jaundice can be transmitted to further subjects by inoculation, both during the incubation period and for at least a week after the onset of the jaundice (Oliphant, Gilliam, and Larson, 1943). These observations suggest that infective hepatitis is a different disease from homologous serum jaundice or post-arsenical jaundice, but they are not conclusive.

Obviously infective hepatitis is not a disease one would choose to study if one was out for quick results. Unfortunately it has proved one of the three most important diseases in the Mediterranean theatre of operations, the others being malaria and venereal disease. Disturbing features of infective hepatitis are the relatively long stay in hospital, the absence of any method of prophylaxis, and the steady rise in incidence in the four successive autumns of the war. On occasion it has interfered with military operations, and it has disproportionately affected key personnel such as officers and air crews. Coming at a time of year when malaria and battle casualties are also likely to be frequent, it imposes a heavy strain on medical facilities. The military authorities may well wonder what the incidence is likely to be next season, and public-health administrators are troubled by the risk of epidemics among the civilian population.

## Clinical Features

Infective hepatitis is characterized by a pre-icteric and an icteric stage. During the epidemics abroad a surprisingly high proportion of the patients have been admitted to hospital during the pre-icteric stage. The symptoms in this stage are quite unlike the picture of "catarrhal jaundice" which many of us had formed. The onset of the illness may be sudden, with high fever. Respiratory catarrh occurs in a small proportion of cases, though it is not certain whether this is part of the symptomatology of infective hepatitis or is due to a coexistent respiratory disorder. In other cases adenopathy is a feature, and the blood picture in the early stage may resemble that of glandular fever. More commonly, anorexia and alimentary symptoms are in the foreground. The dissimilarity between our mental image of infective hepatitis and its real appearance may have two effects: it may cause the observer abroad to

wonder whether the disease he is seeing is the same as occurs at home; or he may be tempted to try to classify infective hepatitis into different types. I shall not anticipate unpublished work further than to say that there is little doubt that it is all one and the same disease.

A major difficulty in the pre-icteric stage is the differentiation from clinical malaria—that is to say, an attack of malaria in which the parasites are found only with difficulty and after a prolonged search. There is sometimes a lull between the pre-icteric and icteric stages of infective hepatitis, and the patient is then apt to be discharged from hospital with the diagnosis of clinical malaria, only to return a few days later with jaundice. In general, anorexia suggests infective hepatitis and splenomegaly suggests malaria, but it is impossible to make the differentiation with certainty at the bedside, and a simple laboratory test for infective hepatitis would be an immense help. A further difficulty lies in the fact that a patient may suffer simultaneously from malaria and infective hepatitis, as is only to be expected from their frequency and their occurrence at the same time of year. Finally, jaundice may occur as a complication of malaria itself when the blood or the liver is damaged by the plasmodium. For all these reasons it is wise to play for safety and to treat the patient for malaria when the diagnosis is in doubt. The importance of early treatment of malaria is great. Many pre-icteric cases of infective hepatitis have been treated with quinine and mepacrine and have taken no harm thereby. Pamaquin, however, is probably undesirable if there is any suspicion of disease of the liver.

Little need be said about the icteric stage, for when jaundice appears both patient and doctor are usually out of the wood. It is of interest to mention that arthritis, skin rashes, urticaria, and conjunctivitis have all been noted in infective hepatitis, and we therefore cannot regard these symptoms as peculiar to homologous serum jaundice, though they are probably more common in that condition. An uncommon but even more interesting symptom is neuritis, either localized or generalized. It must be remembered that both mononeuritis and polyneuropathy are not infrequent in the Mediterranean theatre of war, and that there are few illnesses, medical or surgical, with which infective hepatitis has not at times been associated. We may therefore merely be dealing with the coexistence of two diseases. Nevertheless, similar nervous complications have been seen in this country, and we cannot avoid the suspicion that the virus of infective hepatitis may at times attack the nervous system.

Recurrences of jaundice are not infrequent, appearing in about 2% of cases. In most cases the relapse occurs within four weeks; of 21 relapsing cases, 2 relapsed a second time. The average stay in hospital in British troops is about 15 days, with another four weeks at a convalescent home. Only a very small percentage of cases have been ill enough to evacuate to the United Kingdom. The mortality among cases admitted to hospital is less than 1 per 1,000, and it is probable that a number of subclinical cases never reach hospital.

#### Duration and Treatment

There is no specific treatment of infective hepatitis. There is good reason to believe that recovery is accelerated by rest in bed and retarded by premature activity, and there is a strong conviction that patients take little harm from the amount of fat in the wartime diet, if they eat according to appetite. It may not be possible to provide special diets in the field, and the strict prescription of a fat-free diet may mean actual undernourishment of the patient.

It will probably be extremely difficult to prove the value of any special treatment, as the death rate is so low and the length of illness so variable. In a series of cases admitted to a military general hospital the urine was free from bile within seven days after admission in 15%, within ten days in 55% and within fifteen days in 75%. The coefficient of variation is therefore high even when an objective criterion of this kind is used. It is probably even higher when merely the duration of stay in hospital is measured. Stocks (1944) has analysed the records of 808 patients admitted from the Services to E.M.S. hospitals on account of jaundice. Although the commonest length of stay in hospital (including convalescent home or depot) was 14 days, the range of variation was very wide. A rough calculation from his figures shows that the

mean duration of illness was 40 days, with a standard deviation of 27 days.

To obtain convincing results from therapeutic trials it is necessary to treat a series of alternate cases and controls and to submit the figures to statistical analysis. A calculation based on Stocks's figures indicates that a treatment which shortened the mean duration of the illness from 40 to 30 days would require a series of 117 cases for the results to be barely significant and 263 cases for them to be highly significant. If, however, the treatment shortened the illness by one-half—i.e., from 40 to 20 days—the corresponding number of cases would be only 29 and 66. Carefully controlled studies of this kind are rarely possible under conditions of warfare, when staff is short and patients are liable to be transferred at short notice. On the other hand, it is hard to get enough cases to carry out preliminary trials of this order at home.

At present we do not know what is the amount of time lost from this illness in our Forces. It is possible that it may be unduly high among troops in an operational area, who may be transferred from one hospital to another owing to pressure on beds and may eventually land up far from their own unit. It should not be difficult to discover the facts by an appropriate statistical study, and, if the time lost proved to be excessive, consideration might be given to the formation of special units for the treatment of jaundice close behind the line, such as have been formed for the treatment of venereal disease. Such units would also enable us to get more accurate information than we have at present about the effect of treatment and rehabilitation on the length of stay in hospital and convalescent home and on the rate of relapse. There is evidence that the enemy keeps men with jaundice in the line as long as they are not completely incapacitated.

#### Predisposing Factors

There must be reasons why jaundice is more common in war than in peace and why epidemics occur in the autumn. These, however, can only be predisposing factors, for there have been many epidemics of jaundice in peacetime and in all seasons of the year. The agents commonly invoked are cold, strain, dietary changes, and intestinal infection. So far as cold is concerned, "chill on the liver" is a familiar if vague synonym for infective hepatitis, and I have commented on the coexistence of respiratory catarrh in some cases of infective hepatitis. There is a high incidence of jaundice in British air crews, who may be exposed to the cold of high altitude and in British officers, who, unlike the men, undress at night and sleep in pyjamas. Nevertheless the last epidemic began in the hot weather and declined sharply after the first frost of December. Neither American officers nor American flying personnel show an incidence above the normal, and in our own Air Force steps had been taken to prevent chilling when air crews had to fly at unaccustomed heights over Europe. Men of one armoured division, which had a high incidence of jaundice, were sleeping on camp beds in comfortable barns. Strain also appears an unlikely factor, for this particular division had been resting for three months, and the disease has occurred quite commonly in the back areas during this last year. The high incidence in certain combat troops may be a matter of place rather than of strain.

There is no evidence of any dietary or drug predisposition. It has been suggested that officers, who have had a much higher incidence of jaundice than the ordinary ranks, eat less carbohydrate than the men, but it would be ludicrous to pretend that the officers are suffering from carbohydrate deprivation. Suggestions of a deficiency of vitamins appear equally unfounded. Prophylactic mepacrine was administered on a large scale during the summer and autumn of 1943. Mepacrine is a potentially toxic substance, and there was some difficulty in securing tolerance for the drug when it was first administered but there is nothing to suggest that it had anything to do with the incidence of infective hepatitis. Large epidemics have occurred among troops who were not taking antimalarial drugs in Malta and the Western Desert, and there has been a high incidence among British air crews, who take quinine instead.

\* I am indebted to Major Arthur Jordan, R.A.M.C., for suggesting this calculation.

of mepacrine because it is believed to have less effect on altitude tolerance. There is no evidence that alcohol, arsenic, or sulphonamides play any part, and it is stated that there has been no corresponding seasonal variation in the incidence of post-arsenical jaundice. As for diarrhoea and dysentery, they have been unusually mild in the present war, and they are not more frequent than normal in the history of cases of infective hepatitis.

### Epidemiology

In discussing the epidemiology of jaundice there are two pitfalls to avoid. It is dangerous, when studying statistics from a large body of men such as a division, to assume that the experience of all its members has been uniform. If the statistics are analysed it will be found that no such uniformity exists, owing to the diverse movements and contacts of the individuals, and the losses and replacements of personnel. A unit which has been in a theatre of war for a year may contain less than half its original members; the remainder may be new-comers to the area. It is equally dangerous to assume that the epidemic of 1943 was a kind of influence or process which began in the middle of August and ended in January. Such influences may indeed exist, and it is true that the collected figures for a whole area or army form a smooth curve which extends over such a period. But when we break down the statistics into their component parts we find that the major epidemic is really the sum of a number of minor epidemics, which were by no means contemporaneous. In the present state of knowledge it would seem wise to base our opinions first on accurate study of these individual small epidemics.

Unpublished studies of this kind have now been made by a number of observers (Kirk, 1943; Spooner, 1943; Mallory, 1943). When a single unit is studied, such as a squadron of an air force or a body of troops living and working together, the pattern of the epidemic is not very different from outbreaks of jaundice in schools and similar communities at home. A herald case, then perhaps another at an interval of 1 to 3 weeks, usually 10 to 13 days; a similar interval, and then the epidemic, which rarely may be almost explosive in its intensity. The great bulk of the cases may occur within 14 days of each other, though usually they are spread over a longer period. I am not going to pretend that observers have agreed in their interpretation of these phenomena. The argument is whether they can be explained by the orthodox hypothesis of droplet infection or whether we must invoke some other mode of spread. To my mind the orthodox hypothesis is quite adequate. But my point at the moment is that this kind of analysis of concrete situations is the proper method of approach, and we should exercise great caution in drawing conclusions from crude data such as the general incidence of jaundice, flies, temperatures, etc.

Infective hepatitis may be localized in place as well as in time. The localization may sometimes be very precise, as in a series of cases occurring at approximately monthly intervals among people working in the operating theatre at a general hospital. Such an attenuated epidemic could very easily be explained by droplet infection, though it had also raised the possibility of infection via blood-contaminated hands. Commonly, however, localization is on a broader scale. In 1942 the Eighth Army bore the brunt of the attack of jaundice, and the incidence was heaviest in troops who had actually spent a week or more in the Alamein battle area. Though the incidence of the disease in Egypt rose considerably in Oct., 1943, it soon fell, and never reached the high levels of 1942 when the troops were in the Western Desert. The Americans believe that there has been less liability to jaundice in the Casablanca area than in Oran and Sicily.

There is no doubt, however, that the disease is endemic throughout the whole Mediterranean area. Cameron (1943) has already shown this for Palestine. Several better-class Egyptians with whom I talked spoke of their children having had jaundice. Dr. A. F. Zanaty told me that not only did he see the disease in private practice in Cairo but that there had been a small outbreak among Egyptians attending the King-Fuad Hospital towards the end of 1943; the age of the patients was 15 to 30, and the disease began with slight fever and respiratory catarrh. Moreover, severe cirrhosis which is

not due to bilharzia is not very uncommon in Egyptian children about 7 to 10 years old; some of this may be the sequel to infective hepatitis. In North Africa infective hepatitis is not infrequent in the French and Italian colonists. There is no information about its occurrence in the Arab-Berber population, but all that can be concluded from this is that there has probably been no major epidemic among them.

Although there is a local reservoir of infection, there have been some curious differences in the incidence of the disease in different elements of the Allied forces which have come to the Mediterranean area. The relative immunity of Indian and Maori troops has already been established. It has since been discovered that the relative incidence in white and coloured troops in the American forces is 10 to 1, though there is no difference in work or feeding habits. A contrast is provided by native Belgian Colonial troops brought to the M.E. Among these there were 216 cases of infective hepatitis, with 9 deaths. They are a primitive people who had previously mixed little with other races, and they have also suffered severely from mumps and chicken-pox. It is hard to imagine that a people could have an inborn susceptibility to three different infectious diseases, and these variations in racial susceptibility may well be acquired characteristics.

There is another variation in incidence which can hardly be explained by any inborn difference in susceptibility. This is the fact that officers in the British Army and flying personnel in the R.A.F. are four times as often affected as ordinary ranks and ground staff. The most popular explanation of this phenomenon is that it is due to a difference in feeding habits. The ordinary soldier lines up to receive his food in his individual mess tin, whereas officers and flying crews mess together and share crockery in common. It is therefore easier for infected crockery to circulate among officers and air-crews than among ordinary ranks.

A number of facts support this explanation. Officers and men were equally attacked last year in the New Zealand forces who were in the battle area, where officers may eat under the same conditions as the men. There is no difference in the incidence of infective hepatitis in officers, air-crews, enlisted men, and ground staff in the American forces. American officers more often eat with their men than do ours, using their own personal mess tin or can of food. Moreover, American dish-washing facilities have hitherto been better than ours, and officers' messes have followed the standard procedure, in which the utensils are dipped in water which is actually boiling, so that the risk of transferring infection by this route is minimized. In the British Army officers' cook-houses have not always been as strictly supervised as those of the men, and the level of hygiene has sometimes been inversely proportional to the rank of the mess.

Measures to improve the hygiene of washing-up should of course be encouraged. Too often the water is cold, greasy, and dirty, and the towels far from clean; soap is often in short supply, and however carefully the crockery is rinsed a film of grease remains on it. There is evidence that units who wash up with soapy water have less jaundice than those who do not, but I am not convinced that communal crockery is the essential cause of the high incidence of jaundice in British officers and air-crews. The Service man's knife, fork, spoon, and mug may well be contaminated during washing-up in the communal bucket, and the use of communal plates is very common, especially in more static units. Again, it is odd that warrant-officers and sergeants, who also have their own mess and communal crockery, do not have a high incidence like the officers. It is said, too, that officers are unduly prone even when they are living and eating in their own homes or billets, though I do not know of any figures to support this statement. Like so many dramatic events in epidemiology, the high officer incidence of hepatitis seems on analysis to be due not to a single decisive factor but to a concatenation of circumstances: not only to communal crockery but perhaps to a higher susceptibility of the officer class, a greater opportunity for contact with strangers, the relative youth of flying personnel, and other unrecognized factors. It is a pity that a clue which at first sight seemed so promising has led in the end to no definite conviction.

Even if we accept the hypothesis of infection by eating-utensils it should be noted that it does not imply an excremental spread of infection. Similar precautions have to be taken in anatoria for tuberculosis to prevent the infection of crockery with tubercle bacilli in the sputum. This point is made because of a hypothesis that the disease may be spread by the excreta rather than by droplet infection. It is certainly surprising that in spite of the frequent admission of cases to hospital in the pre-icteric stage, which is often regarded as the most infectious period, several hospitals have had not a single case of cross-infection in the wards or of transmission to hospital staff. But this could be paralleled in pneumonia and cerebrospinal fever, which are certainly air-borne. The place localization and the seasonal incidence may be more suggestive of transmission by excreta, and it has been stated that on taking up position on a clean site there is no jaundice and on a dirty site there is jaundice, though little evidence is advanced for his statement.

It was noted this year in North Africa that jaundice declined sharply after the first December frosts. This is reminiscent of poliomyelitis, in the spread of which flies are now believed to take part. The curve of the fly population figures in North Africa and Egypt has peaks in May and October and a trough in August, when it is too hot for the flies to breed. The curve of the incidence of dysentery, which is largely a fly-borne disease, has the same bimodal outline. The jaundice curve, on the other hand, is monophasic, with a single peak about October and November. This has been used as an argument against transmission by flies, but it is only fair to the hypothesis of transmission by flies to point out that gonococcal ophthalmia in Egypt, which is almost certainly transmitted by flies, has the same monophasic autumnal incidence (Wilson, 1936). It is only in autumn that the temperature and humidity are high enough to allow the gonococcus to survive during transfer, and the same might be true of the virus of infective hepatitis. Finally, it has been noted that jaundice occurs at a time when culicine mosquitoes are prevalent. There is no conclusive evidence that insects or excreta spread infective hepatitis, but here is enough to make experimental work in this connexion desirable, and indeed rather urgent.

### Discussion

Some people are of the opinion that we already have more aets about the epidemiology of infective hepatitis than we an digest and that little more can be learned from field studies until techniques are invented for the detection of the virus or the discovery of latent or subclinical infection. Certainly such techniques would constitute an enormous advance, but it is doubtful whether we do yet possess all the data which could be secured about infective hepatitis as it is now occurring in an epidemic scale. There is still need for intensive study of the incubation period and mode of spread at the actual time and place of the outbreak. Only the man on the spot knows what people are actually doing; whether, for example, men listed as flying personnel are actually flying and, if so, how often, how long, on what types of machine, whether on operations or not, and so on. Again, cases of jaundice in different ranks may actually be occurring in the same place. Other factors, such as movements, replacements, and contacts of troops, incidence of jaundice in the civil population, topographical distribution in units, cook-house hygiene, sanitary discipline, flies, and exposure to cold or to strain, must obviously be studied at the time if information about them is to be accurate. There is also still much to be learned from the analysis of data already collected. We ought to be able to answer the following questions, but I do not think we can.

1. To what extent and for how long is the individual protected against infective hepatitis by a previous attack of infective hepatitis, serum jaundice, or post-arsenical jaundice? Lieut.-Col. H. L. Wallace found that 4% of a series of patients with infective hepatitis have a previous history of jaundice. I have already mentioned that an attack of serum jaundice seems to make people more susceptible to infective hepatitis.

2. To what extent is the herd protected by a previous epidemic of jaundice or by experience of a batch of icterogenic yellow fever vaccine?

3. To what extent is such protection, if any, influenced by replacements and additions to the herd?

4. Does the seasonal incidence vary in different places and countries, and, if so, can it be correlated with temperature, humidity, flies, etc.?

5. Is there a similar seasonal variation in the incidence of post-arsenical jaundice?

But although we may agree that epidemiological study of infective hepatitis in the field is still worth while, we can hardly begin to exercise rational measures of control until we can answer questions like the following: (a) What are the vehicles of infection—nasal secretions, urine, faeces, food, eating-utensils, fomites, etc.? (b) What is the normal route of infection? (c) Can flies, mosquitoes, or other insects transmit the disease? (d) How can the virus be inactivated, with special reference to camp hygiene? (e) How early in its course and how late is the disease infectious? (f) What are the factors which affect susceptibility to infective hepatitis?

These questions cannot be answered without experiment. Laboratory workers will doubtless continue to try to infect animals in the hope that eventually an animal or a strain of jaundice will be found that will take. At the present moment however, no immediate line of advance seems open, except transmission to human volunteers. This is not an encouraging outlook; for knowledge rarely increases rapidly when a disease can only be studied by human experiment, as the history of leprosy, trachoma, and pernicious anaemia shows. In the case of homologous serum jaundice we might well quail at the risks of human experiment; for of the 109 recipients of K. 60 the notorious batch of pooled measles convalescent serum 41 sickened—37 with jaundice—and 8 died (Memorandum by Ministry of Health, 1943). Fortunately this seems to have been a most unusual serum, and where homologous serum jaundice has developed after yellow fever vaccine the mortality has been of the order of 1 per 1,000. We have no reason to believe that when infective jaundice is deliberately induced the mortality will be higher than that of the spontaneous infection; and that again is probably less than 1 per 1,000. Nor need we believe that the incubation period will be longer than the usual 30 days, though Cameron's experiments suggest that it might be. Nevertheless, the number of subjects who may be encouraged to volunteer for experiments on the human transmission of infective hepatitis is clearly limited, particularly in time of total war, and a similar limitation must be placed on the circumstances under which it may be permissible to propagate the infection in the community. I am sorry it is not possible to be more optimistic about the prospects of research on infective hepatitis, and I repeat that the prospect might change overnight if we discovered a suitable animal. But at present it is a hard problem. If it had been easy it would have been solved years ago.

### Conclusion

Much of the information in this article is derived from confidential papers and reports, and from conversations during a recent brief visit to North Africa. It is not an official pronouncement, and I may well have made mistakes in reporting what I have heard and seen. In one matter, however, I think I shall not be contradicted. The volume and the quality of the work of physicians serving with the Forces over-seas are of a very high order, and they are perhaps not sufficiently appreciated by those of us who have remained to practise medicine at home. A military general hospital in the field may admit more than three times as many patients a year as a teaching hospital in Great Britain. This has been a physicians' war so far, and many more men in the Forces have been treated for sickness than for injury. In the first half of the war civilian surgeons in this country treated more casualties from enemy action than their opposite numbers in the Services. On the other hand, physicians at home have had no experience to compare with the epidemics of venereal disease, malaria, and jaundice, and the outbreaks of diphtheria and poliomyelitis, with which their colleagues in the Service have so brilliantly contended.

### Summary

Infective hepatitis is one of the three most important diseases in the Mediterranean theatre of operations and one of the major medical problems of the war.



Orthodox opinion is that the rate of progress in knowledge and technology is expected to be rapid, but useful knowledge is expected to be slow and human progress is expected to be slow.

In the absence of a susceptible animal, progress in knowledge and control of the disease cannot be expected to be rapid, but useful information might be derived from carefully planned human transmission studies.

## REFERENCES

- mission studies.
- REFERENCES
- Cameron, J. D. S. (1943). *Quart. J. Med.* 12, 119
- Gordon, J. E. (1944). Personal communication.
- Kirk, R. (1943). Unpublished report
- Mallory, T. B. (1943). Unpublished report
- Memorandum by Medical Officers of the Ministry of Health (1944)
- 1, 83.
- Olinphart, J. W., Gilliam, A. G., and Larson, C. L. (1943). *Pub. H. Wash.*, 58, 1233.
- Salaman, M. H. C. (1944). *Proc. roy. Soc. Med.* (In the press.)
- Spooner, E. C. (1943). Unpublished report
- Stocks, P. (1944). *Bull. Min. of Health & P. H. S.*, 3, 22.
- Voegt, H. (1942). *Munch. med. Wschr.* 89, 76.
- Wilson, R. P. (1936). *Rep. Int. Ass. for Preven Blindness and Im. O.*
- against Trachoma.

WITH THE EIGHTH BY  
Brigadier CHARLES DONALD, O.B.E., Ch.M., F.R.C.S.  
Consulting Surgeon Army Medical Service

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**EVACUATION AND EVACUATION SURGERY**

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### EVACUATION AND EVACUATION SURGERY

The post-operative transference of the patient to the base, with its strains, vicissitudes, and delays, is a factor which influences treatment to an extent requiring further consideration. Already some idea has been given of a few of the difficulties.

— campaigns the surgeon often had only a very rough idea of the nature of the further evacuation, and consequently

In these campaigns the surgeon often had only a very rough idea, occasionally he had none, of the nature of the further journey of his patient, in terms of time, distance, and conveniences. While he knew that patients would be scrutinized at every halting-point, he appreciated that the less they or their dressings required to be disturbed on the way the better.

Road, rail, air, and sea, all were used. Road evacuation undoubtedly does more harm to patients and their wounds than do the other forms. An ambulance speeding along the wide smooth roads of England gives an impression of comfort and rest that is misleading. The roads in the countries of these campaigns, apart from a few main highways in Italy, do not compare, and by the time an army—or rather two armies—the retreating and the pursuing—have passed over them with the juggernauts of modern war the best become pock-marked and irregularly crumbled at the edges. That is putting the matter at its best. In the desert tracks became furrowed and, when the sand was soft, vehicles floundered like small craft in a choppy sea. In country cultivated but not populous, roads were narrow and unsurfaced. Wide vehicles forced one another into side ditches. As the cookery books say, add a little water.

If he lie inside recumbent on a stretcher it is an education for a surgeon to make an ambulance journey of some 50 miles over rough roads. Because of the swaying and jolting it is a nauseating affair, however careful the driver may be. What, then, of the less fortunate patients? There are some to whom a road journey of a mile or two, even less, would be fatal. To others the risk may be considerable; to none is it beneficial. The appreciation of the value of general rest for injuries comes, therefore, to a young surgeon. He is apt, in a moment of enthusiasm, to say such things in terms of local

Appreciation of the value of a young surgeon. I think, a little slow to calculate overmuch in terms of plaster-of-Paris age, to splint is not necessarily a patient's rest. A limb well splinted naturally also leads to local results by the lowering of resistance to infection. When undertaken as described, when undertaken by patients, there may be given

What happened to patients and their wounds on and after such road journeys as have been described, when undertaken a day or two after operation? Some examples may be given.

In cases of compound fracture due to road accidents in civilian experience as forward consulting surgeon, M.E.F., 1943, and January, 1943, to

practice limbs are frequently put, after operation, in skin-tight  
plasters and the patient is retained in hospital. Splitting of the  
cast is often done as a routine for safety, and certainly is fairly  
often required. If similar patients in these campaigns were  
sent on a road journey of several days' duration, not only was  
it found that splitting of all such castings was essential, but  
that splitting was not enough and that a split padded plaster  
was required. Otherwise circulatory risks and disasters occurred.  
In abdominal cases the journey, if undertaken much before the  
tenth day, frequently produced an intractable ileus. Patients  
with chest wounds who were still showing some dyspnoea or  
cyanosis while at rest became acutely embarrassed. Shocked  
patients had their shock increased. Patients with early infection  
had their resistance undermined.

Thus the clinical needs clashed with the administrative necessities. Theoretically there could be a multitude of holding units close to the line. That is the ideal of the medical service. In actuality, however, the medical units were few and far between. They were not to be fought with hospitals instead of tanks, or with

Thus the chain of command was maintained. Theoretically there could be no compromise. That is the ideal of the medical units close to the line. That is the ideal of the services. But wars are not to be fought with hospitals instead of artillery dumps, with ambulances instead of tanks, or with savings instead of rifles. Compromise, then, was required. The serious cases had to be held. Half alive in the field is better than dead at the base. The proportion of casualties detained where they were operated upon varied between 3 and 5. All else had to start down the chain. The chain itself had to be reasonably clear. Along it occurred what might be called evacuation surgery. This, in spite of the term "coffee-milling," was a skilled business and had never to have a casual air about it. Vigilance and ability were required to deteriorate and retain and treat those whose condition had deteriorated on the way, to note any overlightness of plaster casings, to renew, when necessary, dressings and casings, to spot and treat secondary haemorrhages, and to be helpful in the many little but important ways that made for the patients' comfort on their further travels.

### Air Evacuation

**Air Evacuation**

Air evacuation prevents attractive possibilities and has often provided a magic carpet to transfer patients to a base expeditiously in a few hours, on a journey that would otherwise necessitate days, even weeks. Many thousands of sick and wounded in these campaigns were so transferred.

On rare occasions when the plane brings wounded patients home, and dealing only with post-operative patients, the air evacuation has been a

Onmuting rare occasions when the plane brings wounded or injured men to the surgeon, and dealing only with post-operative transfers, it must be observed that air evacuation has limitations that are not apparent at first sight. To the popular imagination the idea of the seriously wounded being operated upon quickly, and immediately transferred to the base by air, is a fascinating one. But these seriously ill patients, operated upon well forward, would necessarily have to make a road journey to an aerodrome and another road transport to explain end. Enough has been said about road transport. Occasionally in why such journeys should be avoided. Occasionally in the desert a landing strip could be made alongside a casualty clearing station. In closer country that ideal will not be possible until planes can land with the uncertainty of the planes. Except was another drawback—the uncertainty of the planes. Except for a few special ambulance planes in the desert, casualties were always removed in freight planes which brought up fighting stores and were fitted with stretcher racks for the return journey. There was, due to war exigencies, always some uncertainty as to what planes might be coming and whither they would be returning. While this was a difficulty that was got over in part by special sections of field ambulances sited on the aerodrome, the latter was no place to keep the serious casualties hanging around. The saying that no one is fit for the air who is not fit for the road became more than a saying, it became a rule.

The highest values of post-operative air evacuation were two. The first was to transfer certain patients who, though fit for road evacuation, were liable to special dangers if the journey were protracted. For example, a patient with a fractured femur might, without air evacuation, be some weeks in a Tobruk plaster. In this the limb is not so much "set" as made comfortable for transport. Any malposition might therefore be well organized before more adequate traction methods could be applied. A second example is that of a patient with a penetrating brain wound, where the routine daily treatment

\* Based upon experience as forward consulting surgeon, M.E.F. and A.F.H.Q., in October-November, 1943, and January, 1943, to February, 1944.



and observation to avoid and detect the onset of meningitis or brain abscess are of prime importance. The second high-value of air transfer was the less spectacular one—the removal of large numbers of both sick and wounded from the front areas. Such air removal lessened road congestion, it saved petrol, it avoided using up medical stores and food and the so many other things that had to be brought up, and it lessened the work for nurses and orderlies, who were now freed to give the retained patients more attention.

Air evacuation undoubtedly will prove in time a still more powerful aid. In these campaigns it had necessarily always something of an *ad hoc* air about it. But war calls for such arrangements. *Ad hoc* meant very often *ad astra*.

Rail and sea evacuation need little consideration. Their advantages over road transport are obvious. The retreating enemy never failed to blow up any railway bridge. There was always, therefore, a delay before the line was ready and a railhead established. Once that had been done, both administrator and surgeon were considerably relieved.

### THE FIELD SURGEON

With the intermittency of the fighting the field surgeon's professional life alternated between idleness and activity, between boredom and gusto, between rest and exertion. The quiet periods, when of any duration, were far the most trying. Probably it is less irksome to have no patients than to have very few. Not always are there many casualties; not everyone can be in the forefront at the same time. Efforts were continuously being made to give all their share of each level of work. Those at the back, it should be noted, were always at the service of the local population, now returning pathetically after the tide of battle had passed. The mines which bestrewed their land found many victims. The attractive highly coloured little booby-traps, simulating fountain pens, shaving sticks, and the like, were eagerly picked up by children.

The surgeon had, of course, a regimental life as well. He and his team had to be adroit at quick setting up and taking down of their gear, at neat and economical lorry-loading, at tent-pitching and tent-striking, at finding the next site by a map reference without mistake or delay. The surgeon had his stocks to watch and maintain. He had to look after and train his orderlies. The labours of the latter do not finish with the operation, and it is fair to say that to them their work is more exacting than is the surgery to the surgeon.

It has been said, and often repeated, that war surgery is the worst possible training for the young surgeon. What, of course, is meant is that it is the worst possible training for civil surgery. The view is, I think, both unfair and thoughtless. It disparages, in its narrow outlook, a type of surgery devoted to the care and preservation of the flower of the nation's manhood, a manhood which has shown itself no less resolute than its forebears. Military surgery, from a broad viewpoint, ranks as high a form of surgery as any, and considerably higher than much of the "officially keeping alive" of the aged or already doomed. In the early days of the war many young men sacrificed much, in career and prospects, to help their fellow men. Let it not be forgotten.

War wounds and field conditions certainly provide work of a rougher nature than is to be met with in times of peace. But field surgery has educational and other values that are not to be despised. There is development of clinical and operative judgment in many directions and of quick decision and self-reliance in times of crisis. There is, because of the frequent daily need for personal supervision, an invaluable education in post-operative treatment. There are resuscitation and transfusion, and all their details, to be performed on a huge scale. There is an appreciation of infections that would take long to acquire in civil life. There is the necessity for clear and concise note-making so that a patient's wounds and treatment can be readily appreciated on his further journeys.

The drawbacks are those of relatively coarse manipulations and of an association with a lower standard of asepsis that may dull the surgeon's sensibilities. In rush periods the stench of stale blood and the reek of primus stoves, the continued sight of blood- and mud-stained clothing and dressings and of his own streaked apron, the depression perhaps of the

necessity for several amputations, all these may well at times make a weary surgeon wistfully recall other theatres he has known and doubt if it is surgery he is practising. But such periods fortunately are infrequent and do not last long. In the quieter intervals he can achieve an orderliness and a cleanliness of very high standard. Provided, therefore, that the young surgeon is not kept overlong in the field, the drawbacks may be discounted. It was the rule in these campaigns not to allow him to remain in the field longer than 12 months. Thereafter he returned to a base hospital, invariably against his will. But it was thought best for his own future that it should be so, and the change over allowed of a greater number being trained in forward work.

The necessary proper introduction of strangers to field surgery cannot, alas, always be provided. The exigencies of war do not always permit of it. That proper introduction, however, was achieved in the Italian campaign, when no newcomer to the field treated fresh casualties without having had an apprenticeship comprising periods at a base-hospital in the fighting zone and at a staging post on the lines of communication. Without these experiences, with their wealth of demonstrations of the effects of travel upon the recently operated and their wounds, he was likely to make many initial mistakes.

What are as much wanted of a surgeon in the field as skill are character, physical fitness, and adaptability. There are required a zest and a capacity to go on doing a good job for many consecutive hours, perhaps for several consecutive days, to be up and about at all hours, to take the rough with the smooth, to think in terms not only of technique but of humanity, to perform the little kindnesses as well as the big operations.

Of the need for adaptability little may be said. The different tents and buildings, the need for modifications of apparatus far from an instrument shop, the improvisations necessary to meet this or that emergency, all these difficulties had to be surmounted by the surgeon's ingenuity, aided by the ever-helpful engineer workshops.

Of character and adaptability and skill it may be said there was abundance in the surgeons in these campaigns. What some lacked in experience was readily made good by character and application. Their work was marked by high endeavour and a sense of pride. Thomas Atkins ahead was doing a fine job; the surgeon behind would not suffer in comparison. The rigours of the field further expanded and developed native character and adaptability. Who shall gainsay that these are not unworthy attributes of a surgeon?

### SOME TRENDS IN TREATMENT

Excellent articles have already been written by some of the field surgeons, general and special, and more will doubtless appear. Such are to be hoped for, as only by multiple presentations will a comprehensive picture be obtained. Some notable differences in practice and results will be observed in these papers. They should not be taken as necessarily implying different abilities or even always different opinions. Much depended upon the period in the campaigns, at what level the surgeon was working, the presence or absence of special teams, the pressure of casualties, and the distance from base hospitals. Individual statistics are thus apt to be misleading. Some of the best surgeons had long forward periods among the most unpromising material, and may be tempted to remain mute.

Accordingly much is to be hoped for from the continued insistence that routine field reports would furnish details of all deaths and of interesting cases, including all abdominal ones. (The records of specialized teams were more easily kept.) The number and name of the casualty had always to be included. The follow-up of these should provide wonderful statistical material after the war, in combination with the similar but more comprehensive record demanded of surgeon at base hospitals, entailing like notes on all abdominal, chest joint, and vascular cases.

Here I propose to limit myself to brief consideration of some of the trends of treatment, and to a very few personal observations. In some branches, such as the neurosurgical and maxillo-facial specialties, changes have been more towards quicker

contiguity with the casualty than in technical procedures, permitting the latter to be more often ideally performed. Exploitation of the sulphonamide series and penicillin has, of course, in these specialties as in others, provided scope for comparison.

"We learn from history that we do not learn from history." Some lessons, it must be admitted, have had to be relearned. Every war and every campaign in every war provide differences from the last. It would be foolish to teach surgeons strictly on the lessons of these campaigns. But great principles are common to all; it is the details which change, and details in the field approach principles in importance.

While the transfusion service operated under the directorate of pathology, it is only right to precede any surgical considerations with a tribute to its magnificent organization and achievement, just as its aid to the patient precedes that of the surgeon. Resuscitation naturally plays a considerable part in field surgery. The transfusion element of this was developed in these campaigns to an extent never previously attempted or achieved. While at first sight it would seem likely that, to an army often so far from its base, plasma and serum would have been more forthcoming than blood, in the event there occurred the paradox of whole blood being employed in greater proportion to plasma or serum than some other authorities think advisable or necessary.

The difference is one that must be left to be thrashed out between transfusionists and between surgeons with wide experience of both methods. It is difficult for those brought up, so to speak, on whole blood, to argue. What the surgeons saw was good and they sought no change.

The early initial view that transfusion was perhaps a little overdone came to be modified. There was a fear that surgeons were perhaps delaying overlong, waiting for transfusion to bring about always the same high degree of improvement. With time, however, the transfusion officer was quickly ready to speak when he felt that further transfusion was unlikely to be beneficial. The transfusion officers developed a fine clinical instinct. All statistical comparisons between this and the last war will be misleading if the influence of the more highly developed transfusion services is not taken into account.

### General Wound Treatment

It had been realized long before these campaigns that treatises on war surgery written just before or during the early part of this war had placed over-emphasis and displayed over-optimism on the possibilities of wound closure after excision. Much of the argument was based upon civil and last-war experience in France. Conditions in the latter were mostly static, the wounded were promptly received, and lines of communication were short. More important still, the patients were usually retained if so treated—a point hardly clearly enough pointed out. It is one thing to excise and suture a wound if the patient is retained under scrutiny; it is a very different matter so to do and send the patient immediately on a journey of several stages.

Immediate suture after excision had no place in these campaigns. (I except head and abdominal wounds and the rare favourable opportunity in an outlying unit which could retain patients until the stitches were due for removal.) The time lag, which averaged well over 12 hours, was too long and the necessity for early further transmission was too great. Occasionally a large flap wound was obviously the better to be tacked at a point or two; but that did not entail closure, and the fact that such stitches were in position was made prominent on the field medical card. Attempts at closure in earlier campaigns, and by new-comers later, met with disaster. What were unfortunately largely precluded by the long lines of evacuation were delayed primary and early secondary suture, procedures always to be borne in mind as time-saving where the retaining base is only a few days distant. The advanced base hospitals were always too strained to permit much of this. In the desert, because of the long time lag and because of the absence of severe infections, excision of wounds became modified in degree. More emphasis was required on decompression of the wound, the laying open and freeing of tension, rather than on the removal of much possibly

soiled tissue. Damage in the deeper layers is usually much more extensive than to the surface. In Sicily, and especially in Italy, however, a more radical excision was required to guard against severe infections, particularly gas gangrene, which occurs largely in direct ratio to two factors—the time lag and the thoroughness of the initial treatment.

The practice of excision of skin dies hard. There seems to be a fascination in removing skin that is entirely unjustified pathologically if the wound is not to be sutured. Skin is very resistant to infection, and superficial cellulitis rarely develops in a wound which has been thoroughly opened up. Dead skin is rightly removed; all else is best retained for a possible late primary or secondary suture, when edges have to be pared anyhow.

There are over-tendencies in some quarters to minimize the value of x rays in forward areas and to frown upon anything more than a rapid look for foreign bodies. Certainly these procedures add to the burden in times of pressure. But repeated travel up and down the line convinced me that these are dangerous attitudes. Many of the most serious complications of infection, particularly secondary haemorrhage, can be traced to retained foreign bodies and the contaminated clothing around them.

Not myself a surgeon in the last war, I am content to believe competent observers who assert that the general appearance and condition of patients in the immediate few weeks after wounding contrast favourably nowadays as against 26 years ago. This they attribute in large measure to the oral sulphonamide therapy which is instituted at once and carried on as a routine throughout travel to the base. In these campaigns movements were at a pace which prevented reliable large-scale observations on the effects of administration of this type of drug by local and other routes. But the drugs were given. While it may be hoped from a scientific viewpoint, that opportunities for such research will occur, who would not rather wish that all future campaigns will be as swift-moving? No new therapy, however, has altered in any degree the fundamental necessity for adequate initial surgery.

### Burns

The proportion of burned to wounded was at one time as high as 1 to 10. It may no longer be so high, but it will always be considerable in modern warfare. Tanning procedures in the field had, before these campaigns, proved to be unsatisfactory and dangerous. It was a pity, since painful and time-consuming dressings might have been dispensed with. But the difficulty of asepsis in the field and the strain of the subsequent journey combined to produce a lamentable infection under the tan. Sulphanilamide-vaselined-gauze dressings had taken their place, and still seem the best. Their messiness and their frequent need for reapplication call aloud for something better.

A personal impression has persisted that in the treatment of burns perhaps too much emphasis has been put on the danger of infection. Not that these are not great. But there has been a tendency to be over-impulsive in the early cleansing of severe burns. The patient is admitted, given plasma to restore his pressure to some 90–100 mm. Hg. and is then anaesthetized and cleansed. This cleansing proves almost always more lengthy than is anticipated, and its effects, combined with those of the anaesthetic, are not infrequently followed by a quick morbid result. While the plasma had done much, the patient was still not enough on the right side of life as to be easily pulled back. A policy of withholding anaesthesia, retaining the patient, and doing his extensive dressings in stages under morphine over a period of even three or four days seemed in these severe cases worth trying, and it was my impression that some striking recoveries were obtained.

Due care was taken of the other general considerations in burns, such as plasma administration and control. It may not be out of place here to record that "plasma for burns" has tended to become a slogan, inducing forgetfulness that whole blood may be needed at a later stage.

### Immobilization

The supremacy of plaster-of-Paris casings over other forms of splintage was clearly demonstrated on the testing lines of

communication. There was, of course, no doubt of the issue, but the contrast could be well observed where for reasons of quick access and scrutiny a limb had been splinted otherwise for the journey. (Generally such quick access can be obtained with adaptations of plaster technique.) The necessity for both padding and splitting the cast has already been noted: limb casts for compound fractures between front and base are primarily for comfort; the position of the fracture, within reason, is a secondary matter.

The Tobruk plaster, evolved for the fractured-femur patient (spicas had been discarded) but suitable for other lower-limb injuries, underwent several changes. It started off as a modification of a method used in the last war, in which the bent Thomas splint, with the fixed extended leg within it, had two cuffs of plaster round both it and limb. The first "Tobruk" was an encirclement of the whole length of the splint-and-strapping-extended limb with plaster, adequate padding intervening between limb and casing. The next type incorporated a supporting posterior slab as well. A further development was first to apply a split padded plaster cast to the limb, including the foot, bringing out the extension tapes through holes in the casing, then applying the Thomas splint with cuffs of plaster round splint and cast at thigh and midleg level. There is probably little to choose between the types; all can be done well or badly. My own preference is for the first type, provided plenty of padding is inserted. There is certainly a difficulty with it of preventing some outward rotation of the limb below the fracture; control with the independent foot-piece is more difficult to achieve. But it can be done. A valuable feature of this type over the last described is that it takes half the time and consumes half the bandages. But it was also more favoured, as more comfortable, at the receiving end of the line.

If, as a refinement, the plaster bandages be applied very loosely round splint and well-padded limb, and fingers be kept running up and down the side bars of the Thomas splint, then the centre part of the cast forms a roughly circular tunnel for the limb.

While the "Tobruk" was a satisfactory method, none of the various types of immobilization for compound humeral lesions proved quite as efficient. Thoraco-brachial casings were applied with various little modifications. In general this patient was not as comfortable during transportation as was the fractured-femur patient. Were he fit enough to sit up on the journey then he rarely had any complaint.

The thoraco-brachial plaster is to be thought of for more than a fractured humerus. Shoulder-girdle conditions, such as a compound fracture of the clavicle, need similar support on a long journey.

#### Wounds of Joints

The practice of closure of joints after cleansing (omitting skin closure) where enough tissue is available has followed that of the last war. What was as important, and what was aimed at although not always practicable, was the retention of such patients in the field. They were of a type which generally could reach a casualty clearing station, and it was important they should, because their detention under the supervision of the surgeon who performed the excision was most desirable and was at this level more practicable. However adequate was the plaster immobilization it could never be as absolute in transit as in total rest. Nor was the surgeon at staging posts so informed as the original operator, however good the notes. But, naturally, where there was pressure from in front, these patients could not be regarded as being in the same class of urgency for detention as some others.

#### Amputations

The practice of saving all that was possible where amputation was required was well worked out before these campaigns. No elaboration is required here, since the merit is obvious. It is to be hoped that any suggested methods tried out at general hospitals, whereby primary or near primary closure at sites of election seem assured by small changes of technique, will be tried very cautiously in the field. The standard of asepsis and the rigours of the journey are likely, in this as in many other ways, to upset post-operative healing.

The approximation of flaps without tension by no more than three or four stitches tied over a thin roll of sulph-anilamide-vaselined or dry gauze became general practice. Guillotine amputations were regarded with ill favour, but rapid disarticulation through the knee-joint, as a less shock-producing measure than thigh amputation, was resorted to on occasion with a probably increased chance of survival in critical cases.

The exception to conservation is the compound fracture of the tarsus. Experience showed that practically all of these required a foot amputation sooner or later. It was therefore better in my opinion to do this at once, save in the mildest cases. The immediate performance ruled out a long period of ill-health from osteomyelitis and eliminated the mental woes of patients over whom hung the inevitable loss.

#### Chests

There had been, before el Alamein, a distinct swing over from the radical practices in this specialty advocated in the last war. A much more conservative attitude had been established—perhaps ultra-conservative, since it suggested that, apart from cases in which pressure symptoms were present, aspiration of a haemothorax was better delayed until the patient reached the base, even if that took as long as seven days. With routine sulphonamide therapy the risk of infection was deemed likely to be less than if repeated aspiration were carried out in the field.

This policy was soon dropped. Most patients with a haemothorax reached a casualty clearing station for their surgical treatment, and it became one of the chief interests of its medical specialist to share in their after-treatment and to perform aspiration routinely, starting usually some 48 hours after the time of wounding. The practice of air replacement, which had also been advocated, was discarded as unnecessary from the viewpoint of possible recurrent haemorrhage and as somewhat likely, if infection were present, to favour a total empyema. Generally speaking, chest cases were fit to be evacuated to the chest centre before the onset of a degree of infection requiring drainage.

While, by and large, conservative measures were in the circumstances undoubtedly right, they may be carried too far by forward surgeons and insufficient débridement performed, particularly as regards clearing of broken rib spicules which may introduce infection. With an experienced chest team close behind him, and with often much more work on his hands, the field surgeon, unless he had special training and interest, was, however, probably erring on the safe side.

One real danger to be noted in these patients was the circulatory embarrassment resulting from overmuch transfusion. Transfusion officers were soon aware of this, and did not give more than was sufficient to raise the blood pressure to some 90-100 mm. Hg.

#### Abdominal Wounds

By the time of el Alamein standardization in traumatic abdominal surgery was taking shape. What remained was its more general adoption both in operative technique and in the equally important after-treatment. It was still to be realized by some that the time lag since wounding was not as important a factor as had been held out. Not only time but the nature of the lesion is to be considered. One man may have several large apertures in his bowel and be bleeding appreciably; another may have only a tiny perforation and have bled little. The idea that it was of no avail to operate after 12 hours was still rather prevalent. Patients with colonic tears have been successfully dealt with even after 48 hours. In the desert particularly, the large-bowel content was frequently solid and pollution of the peritoneal cavity relatively slow.

In one invasion where surgeons received casualties within an hour or two of wounding there was an impression that such patients had not done as well as previously when there had been a greater time lag. This is in keeping with last-war experience, that one can be too hasty in operative approach to the abdominally wounded.

Among the operative measures routine exteriorization of colonic wounds, whether intra- or retro-peritoneal, was probably the greatest change from last-war practice. The results of resections of bowel confirmed previous opinion of the hazards

of this sometimes necessary proceeding. The almost routine institution of continuous post-operative gastric suction undoubtedly time and again saved lives by averting the ileus which so commonly occurs whether bowel be injured or not. It matters little how many layers of stitches are inserted to close a bowel aperture if distension is allowed to occur; one layer of Lambert stitching suffices if the bowel wall be kept flat. The restoration of lost fluid by intravenous administration of a sufficient quantity kept pace with the withdrawal.

There was early realization that abdominal patients had to be worked for and fought for, and that even in some of the apparently unfavourable cases a good result can be got with such care. By the excellence of the transfusion services and by the greater exploitation of forward teams probably many more desperate cases reached an operating table than did in the last war. These two factors will invalidate any real statistical comparison. These desperate cases included not only patients with abdominal wounds but also those with both abdominal and other severe injuries such as compound fractures of the long bones. The combination is not uncommon, and is fought with more than fourfold risks.

With the above practices thoroughly carried out, with routine four-hourly post-operative morphine, and with the retention of the patient for ten days where he was operated upon, it is likely that the end-results did not at least fall lower, despite the more desperate cases, than in past wars.

In order to make this paper comprehensive and yet bring it into the limits of an article I have had to omit much. Particularly do I regret omitting the names of individuals. To have mentioned some and not all would have been contrary to the spirit of the Eighth Army, in which brotherhood, kindness, and helpfulness abounded.

Acknowledgments to my seniors I make with gratitude. To Major-General W. H. Ogilvie and Brigadier J. Weddell, the chief consulting surgeons of M.E.F. and A.F.H.Q. respectively, I owe much for opportunity, advice, and support.

Consulting surgeons cannot, however, exercise their full abilities without the sympathetic co-operation at their administrative heads. The successive D.D.M.S. of the Eighth Army during this period, Brigadiers J. Walker, C.B.E., M.C. and E. Phillips, C.B.E. D.S.O. M.C.—were both out to be helpful in any and every way, and the more longer association with the latter, many of the principles of organization described above were worked out. In advanced battle areas and on the west side of Italy there was the same teamwork liaison with another D.D.M.S., Brigadier R. W. Gallowsay, C.B.E. D.S.O.

A good general values his medical services. In his appreciation of their administrative needs and difficulties and in his ready sympathy for the wounded, as displayed by numerous visits to medical units in the field, General Montgomery showed himself no less lacking in humanity than in strategical genius.

## SOME DANGERS OF SULPHONAMIDES IN EAR INFECTIONS

BY

A. R. DINGLEY, F.R.C.S.

Surgeon, Royal National Ear, Nose and Throat Hospital

The use of the sulphonamide drugs in otitic infections is not without its dangers, and it appears to be insufficiently realized that their administration at the wrong time or in inadequate dosage may so mask symptoms, distort the clinical picture, or interfere with the acquisition of immunity that the patient's life may be jeopardized as a result. A distinguished otologist of conservative surgical outlook recently said that he was now opening more mastoids than in pre-sulphonamide days, and this he attributed solely to the increased incidence of these atypical and sulphonamide-distorted types. It is not going too far to state that some otologists are swinging round to the view that these drugs may be so dangerous as to be contraindicated in the treatment of otitic infections unless certain criteria are observed and followed. Too often has sulphonamide been used as a substitute for surgical drainage: too often has it been given in ignorance of the nature of the micro-organism present; too often has its use been applied at a stage of the infection when its administration could only mislead and confuse.

Acute suppurative otitis media usually begins with intense earache, fever, and deafness, and on examination the drum-head is bulging, pulsating, and usually of a purple colour. Such a picture calls for immediate myringotomy, and no amount of

sulphonamide can ever take the place of this necessary step. After drainage is established and the micro-organism isolated, treatment with the most appropriate sulphonamide may be instituted, particularly if the fever persists, and its use may hurry on the resolution of the infection.

Again, after two or three weeks of otorrhoea have passed and subsidence of discharge or fever has not been achieved, the danger of continuing sulphonamides as a substitute for mastoid drainage is a very real one. At this stage of the infection the problem is likely to become one of early osteitis with decalcification of bony trabeculae, destruction of mucoperiosteal cell lining, and thrombosis of vessels in the mastoid cavity. Quite apart from the fact that sulphonamides will not reach the local area owing to inadequate blood supply in the breaking-down tissues, it is unwise, by introducing the masking effect of sulphonamide, to deprive oneself of the presence of signs and symptoms which would indicate the need for surgical drainage.

### Three Illustrative Cases

The following three cases may help to illustrate some of the dangers which may be encountered:

**Case 1.**—A boy aged 10 had an attack of earache at his preparatory school; this was treated with sulphonamides, apparently got better, and the aural condition was subsequently disregarded. His general health remained unsatisfactory and he lost weight—signs which should have been given greater consideration. On arriving home for the holidays one month later the parents were alarmed at his appearance, and noticed that he complained of vague headaches. He suddenly became ill with signs of meningitis. A pneumococcus (Type 1) was isolated, and after four or five days an otologist was asked to see the boy in order to exclude possible "ear trouble" which, however, was not suspected by the medical attendant. The membrane was congested, but no other sign of abnormality was noted. It was felt certain that the mastoid was involved, and this was proved to be the case, both by x-ray and at the operation, which unfortunately was too late to save the boy's life.

**Case 2.**—A doctor aged 43 was taken ill with severe earache, fever, and some deafness; these indications should have suggested immediate myringotomy, but he dosed himself erratically with tablets of sulphapyridine instead. There was an improvement in the symptoms, and until the next bout of pain nothing much was thought of the matter; further tablets of sulphapyridine were sufficient to quiet the condition down so as to make it bearable, but on the fourth morning the pain became intense, and was accompanied by severe headache. The membrane was bulging, and the middle ear obviously contained pus. By this time the meninges were involved, and paralysis and loss of sensation in the contralateral face, arm, and leg manifested themselves. After a most stormy three weeks with turbid C.S.F. (Type 3 pneumococcus), periods of coma, and incontinence, recovery eventually took place after large doses of sulphonamide, Type 3 pneumococcus serum, and penicillin; but the recovery was, to say the least of it, unexpected. A subdural abscess over the greater part of the right hemisphere was found; this was rendered sterile and was absorbed as a result of penicillin treatment. In this case an early myringotomy would in all probability have cured the infection without complication.

**Case 3.**—A call was received to visit a boy aged 10 with a mastoiditis. On inquiry as to the length of history, the curious answer was received that the duration of the ear involvement was four days; this appeared to exclude the possibility of surgical mastoiditis altogether, and the diagnosis was assumed to be incorrect. On examination, however, the mastoid process was swollen and extremely tender to the touch; the ear-drum was oedematous and bulging, and the boy deaf. Realizing that such a condition could not possibly have come about in four days, inquiry was made as to any previous earache, and this resulted in the admission that five weeks earlier there had been an attack of earache on the same side, which was treated with a sulphonamide, had "cleared up," and had since been quite forgotten. It is obvious that a silent necrosis had been taking place in the mastoid process all this time, and that owing to the influence of the sulphonamide the drum had not perforated. The usual signs and symptoms were masked, and it was fortunate that the ultimate state of the ear was easily treated by surgical drainage, and that, unlike Case 1, an invasion of the meninges or the lateral sinus did not present itself as evidence that the ear was still involved. (Infection was with a haemolytic streptococcus.)

### Some Points for Guidance

To summarize, it would seem pertinent to draw up a few points for guidance in treatment of otitic infections by sulphonamides.

1. Sulphonamides will never take the place of necessary surgical drainage, and should not be expected to do so.

2. Treatment of acute suppurative otitis media by a sulphonamide should be reserved for the period after incision of the membrane and bacteriological investigation. If the fever is maintained, the appropriate sulphonamide may be used in full dosage (day and night), but not after the end of the second week.

3. After two, three, or four weeks the condition of the ear, if still actively suppurating, is again becoming one that potentially requires surgical drainage, this time of the mastoid; and signs and symptoms justifying intervention must not be masked by the administration of sulphonamides, which at best will rarely reach the local area but will distort the clinical picture as a whole.

4. Wholesale use of sulphonamides in otitic infections is to be deprecated.

5. If a sulphonamide has been given before drainage, the most valuable help in assessing the beneficial effect of the drug is gained by examining the drum-head frequently. If this continues to bulge myringotomy should not be delayed, because the condition, which otherwise appears to be improving, is in reality becoming more perilous. Persistence of deafness is also a strong indication that all is not well.

6. Patients taking sulphonamide drugs sometimes do not acquire any resistance of their own to the infection with which they are contending, and it would seem that recurrences are more likely in these cases, which, in addition to developing no immunity to the infection, may find the micro-organism has become sulphonamide-resistant. Recently a schoolboy had five extremely severe and prolonged attacks of tonsillitis (haemolytic streptococci) over a period of three and a half months; each attack lasted at least a fortnight, with high fever. All attacks, except the last, were treated with sulphonamides, and it was assumed that, in addition to developing no individual immunity, the micro-organism had become sulphonamide-resistant. Tonsillectomy was uneventful, and has resulted in freedom from any further trouble.

7. It is needless to emphasize the uselessness and danger of giving inadequate or erratic dosage of sulphonamides. If given at all, full doses at four-hourly intervals, day and night, are required for the full period, and the drug should be continued for a time after complete subsidence of fever.

#### General Comment

It would seem, then, that the chief dangers to be met with in cases of otitis treated with sulphonamides are found in those in which this has been the sole treatment. Such cases appear to the unwary to have been completely relieved, and no further anxiety is felt about the ear condition—and there may be much to support such an attitude. Sometimes the middle ear may return to normal, with recovery of hearing; more often the tympanic membrane, still intact, will remain oedematous, the middle ear congested, and with much loss of hearing. Mastoid tenderness is frequently absent. In such a case it is difficult to know what has been happening in the three or four weeks following the initial infection and apparent subsidence, but such signs and symptoms as pallor, loss of weight, dirty tongue, vague headaches, and (probably most important of all) congestion of the unperforated drum-head, with deafness, should give rise to the suspicion that a slow, latent, and insidious infective process which will not undergo resolution is going on all the time. Such masking is the origin of greater potential dangers than those seen in pre-sulphonamide days, in which the course of the infective process could be clearly followed.

Some help can be gained by radiography, and this should always be used in doubtful cases. Mastoid tenderness and swelling in these atypical cases usually manifest themselves late, about the fifth or sixth week, but not before a critical latent phase has passed, in which the lateral sinus, the meninges, or the brain might just as easily have provided the first sites for an extension of the original infection.

In cases, or suspected cases, of thrombophlebitis of the lateral sinus and brain abscess, reliance should not be placed on sulphonamide drugs, which (a) will fail to eliminate the infection and so lead to catastrophe, and (b) will mask the indications which would suggest the necessity for surgical intervention.

One must remember that sulphonamides bring about a condition of bacteriostasis; unless the patient's immunity is sufficiently raised, either artificially by appropriate serum or naturally by his own efforts, the micro-organism will be capable of regaining its activity. This was well seen in Case 2, in which large doses of sulphadiazine (60 g. in 8 days) brought about such a great improvement that the hemiparesis and hemianaesthesia were almost eliminated and the signs of meningitis had practically cleared; within a few hours of stopping the

drug, however, the patient relapsed into coma, with turbid C.S.F. and incontinence, and was only restored to consciousness with the greatest difficulty by means of intravenous sulphapyridine. Large doses of intravenous serum and penicillin intrathecally and intramuscularly led to eventual recovery. I would appear possible that, in the future, it will be proved that penicillin is capable of bringing about sterilization and absorption of purulent foci, and so dispense with the need for surgical drainage in these cases; this is a feat which it is beyond the power of sulphonamides to achieve.

## BONE-MARROW TRANSFUSION IN INFANTS AND CHILDREN

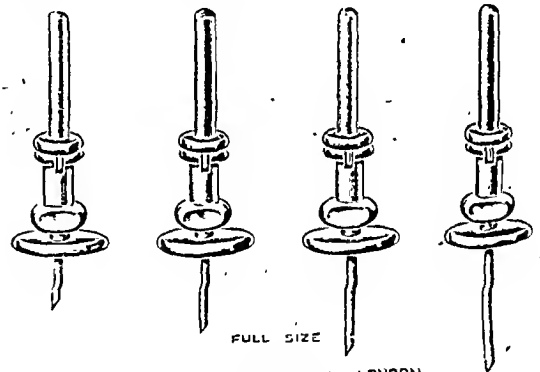
### INTRODUCING A SPECIALLY DESIGNED NEEDLE

BY

JANET D. GIMSON, M.B., B.S., D.C.H.

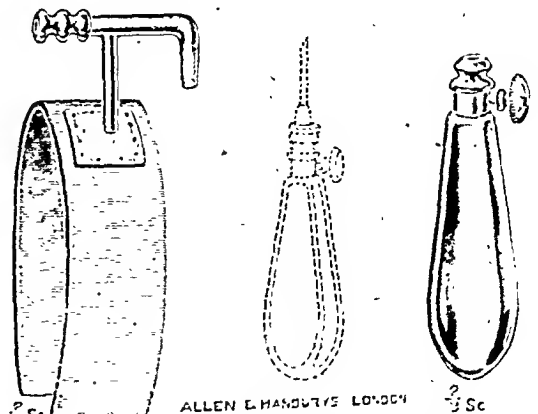
Resident Assistant Physician, the Hospital for Sick Children,  
Great Ormond Street

Some skill and experience are required to insert a needle or cannula by the cut-down technique into a vein of the ankle, cubital fossa, wrist, or scalp of premature and small infants. These, however, are a group of patients who not infrequently need parenteral fluid. An attempt has therefore been made to develop a more simple method than the intravenous, and one which would be at least as safe and sure. The bone marrow of the tibia was the site elected. The marrow cavity in the sternum of infants, and in fact of considerably older children, is not large enough for this to be a practicable place for the reception of transfusion agents. Hamilton Bailey (1944) has reviewed the present position with regard to bone marrow for this purpose, and is favourably impressed. He mentions the winged Witts sternal-puncture needle as admirable for cannulization of the sternum in adults. In my opinion, however, a Witts needle or a Tocantins needle leaves much to be desired in use for an infant.



ALLEN & HANBURY'S LONDON

FIG. 1



ALLEN & HANBURY'S LONDON

FIG. 2

The needle illustrated (Figs. 1 and 2) was designed for transfusions into the tibial marrow of infants and children. The following features may be noted:



- (a) The needle is light.
- (b) The distance between the mount and the flange is short.
- (c) The flange is immovable, and so the extra weight of a screw mechanism is avoided. The least possible movement of the needle in the cortical bone is thus allowed and this junction remains firm.
- (d) Four different lengths of needle below the flange have been made: 1/4 in., 3/8 in., 1/2 in., and 5/8 in. Size 18 s.w.g. is suggested for the two smaller; size 16 or 17 s.w.g. for the larger. The 1/4-in. size is suitable for premature infants and neonates, the 1/2-in. and 5/8-in. for about 5-year-old children or over. But the length of needle used should be according to the size of the child and the amount of subcutaneous fat.
- (e) Each needle has its own stylet.
- (f) There is one handle for the set, which can be screwed on to the stylet in order to get a good grip during insertion of the needle.
- (g) The right-angled adaptor, with the strut to keep it firmly in position, leads the tubing along parallel to the limb. The rubber strip attached to the base of the strut is strapped round the limb. Occasionally, owing to fat or oedema or some other irregularity of contour, the strut on the adaptor seems too long and will not sit on the leg and in the needle satisfactorily. An adaptor without a strut is therefore supplied in each set. The tubing should be fixed in two places with strapping—to the limb and to the splint. The splint should extend 4 in. to 6 in. beyond the foot.

### Technique of Insertion

The place chosen on the tibia is the flat subcutaneous plate of bone inferior and medial to the anterior tibial tuberosity. This area is well below the epiphyseal line, above the nutrient artery, and there are no important anatomical structures to which damage might be done between the skin and bone. It will be remembered that a cross-section of the tibia is roughly triangular. A non-touch technique is maintained so far as is possible, as during any operation involving bone.

1. The limb is splinted in a semi-externally rotated position (as for cutting down on to the internal saphenous vein at the ankle).
  2. The skin is cleaned. Local anaesthesia of the skin, subcutaneous tissue, and periosteum is given with 1% novocain. The area is massaged to disperse the anaesthetic, and the anterior and medial borders of the tibia are palpated.
  3. The needle and stylet, with the handle attached, are taken and with the needle at right angles to the plate of bone—i.e., pointing postero-laterally with reference to the leg itself—are inserted with a firm twisting motion as when using a bradawl. The needle passes through the cortical bone with a crisp crunch. The flange rests lightly on the skin.
  4. When the stylet is withdrawn a small amount of marrow may well up or be sucked up into a syringe; it seldom flows out freely.
  5. The adaptor, filled with the transfusion fluid and attached to the tubing from the dripper and bottle (which has already had air bubbles excluded), is fitted to the needle and the flow started.
- Fig. 3 shows the arrangement for transfusion through the bone marrow of the tibia.

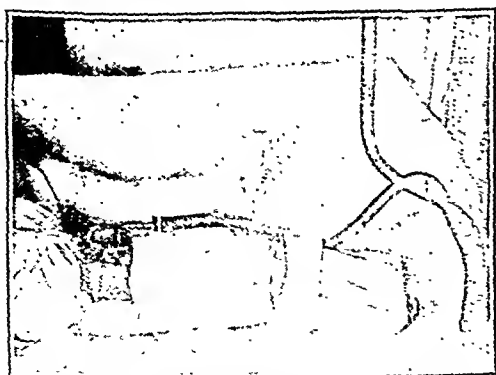
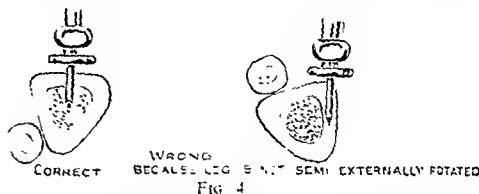


FIG. 3.—Close-up of the arrangement for transfusing through the tibia in the case of a 3-months-old boy with bilateral mastoiditis.

Any of the usual transfusion fluids may be given in this way—saline, Hartmann's solution, blood, serum, or plasma. When using blood it is often necessary to increase the pressure by raising the bottle as much as six feet above the needle; or, alternatively, the blood may be diluted. The constant rate

of drip which can be maintained is usually remarkable; the rate required is adjustable by a screw clip on the tubing. The older the child the larger the marrow cavity and therefore the faster the flow can be. The longest time one transfusion has been maintained was six days. When the needle was taken out it was still firmly held in the bone, and there was no reason to suppose that the transfusion could not have been continued had it been necessary.

Particular attention might be paid to the following points: Emphasis is laid on the necessity for inserting the needle at right angles to the surface of the tibia. This is facilitated by the position of semi-external rotation of the limb. The diagram (Fig. 4) shows the error of attempting to insert the



needle in the antero-posterior direction of the limb, as might happen if the leg were not fixed in the correct position. It is probably wise to inject a small amount of saline through the needle as soon as it has been inserted, to ensure that the marrow has been entered satisfactorily. The adaptor can then be securely connected.

If the needle does work loose, fluid will leak back into the subcutaneous tissues and the limb will become oedematous; the transfusion must then be stopped. A careful watch for oedema should be kept during the first hour or two of the transfusion, because, if oedema is allowed to develop, a pressure necrosis of the skin beneath the flange might result.

Dislodging by kicking with the other leg can be prevented by anchoring it with a handkerchief round the ankle. A small cradle will prevent disturbance by the bed-clothes.

If a second transfusion is required soon after the first has been discontinued the other tibia must of course be employed, as leakage back through the original hole will make that leg impracticable.

It would seem wise to reiterate the need for strict asepsis, since osteomyelitis, though it remains theoretical, is the haunting danger.

The procedure can be facilitated by giving a feed or an appropriate dose of chloral hydrate; these will quiet the baby and often surprisingly help the initial stages of the transfusion.

I want to thank Dr. Donald Paterson and Mr. T. Twistington Higgins for their interest, and Dr. King Lewis for his encouragement and suggestions. The needle and attachments have been made by Messrs. Allen and Hanburys Ltd.

### REFERENCE

Bailey, Hamilton (1944). *British Medical Journal*, 1, 181.

## "CELLOPHANE" FOR THE TREATMENT OF BURNS

BY

JOHN FARR, M.D., F.R.C.S.E.  
Major, R.A.M.C.

Since Davidson's communication in 1925 many other observers have contributed to the literature on the treatment of burns. Usually their methods have had at least two factors in common: first, the exclusion of air, to promote the patient's comfort and to diminish shock and infection; secondly, to allow epithelization to proceed undisturbed by frequent and painful dressings. Within the last three years some observers have emphasized the similarity between the pathology of a burn and that of other wounds, and have reiterated the harm of tissue irritants in the toilet of the burn and demonstrated the value of firm pressure upon the area to support the damaged vascular bed. In the American literature the application of these principles has come to be known as the "cleansing, rest, and compression" treatment of burns. The



work of Allen and Koch (1942) and Siler (1942) has been especially convincing, and their results compel a trial of their methods.

A modification of this form of treatment has been employed in 10 consecutive admissions to a general hospital. The modification advocated is the use of an occlusive dressing medicated with sulphanilamide through which the burned area may be easily inspected. This is achieved by the use of "cellophane" and unguentum sulphanilamidi. The number of cases is unfortunately very small, and there has been no investigation of the blood chemistry or viscosity in the cases studied. All the burns were of the second degree, the average stay in hospital was about 21 days, and all the patients returned to duty. The results have been so uniformly successful that it is thought that a description of this form of treatment will be of value, especially now when the transportation of burned Service personnel presents such problems in the prevention of shock and infection. The use of "cellophane" as a splint for Thiersch grafts has been described by Poth (1942); Ellis (1943) recommends using this material as a dressing for tropical ulcer; but in the literature at my disposal it has not been mentioned as a dressing for burns.

#### Local Treatment of the Burned Area

Using general anaesthesia, the intact skin surrounding the burned area is thoroughly cleaned with white soap and water, and then the toilet of the actual burned area is meticulously carried out. The importance of gentleness and the use of normal saline in irrigating the burned area has been sufficiently stressed in the original papers, but it is well always to remember that "in any burn the vascular bed of the area has been seriously affected."

The medicated sheets of "cellophane" are then applied so that each overlaps the other for about an inch. These sheets adhere to one another and to the intact skin, and the entire burn is embraced in an envelope that permits of easy inspection and prevents contamination. Next, perforated oiled silk is wrapped around the "cellophane." This is not essential, but does help to prevent the wool (which is what we have had to use for compression) from adhering to the dressing and tearing it when removed. The use of sea sponges for compression would probably make such a precaution unnecessary. A firm bandage completes the dressing. After 48 hours the burn is inspected. The "cellophane" may be in some parts blistered by collections of serum. Any such bullae are trimmed away with scissors, and the area affected gently cleaned with saline swabs and another sheet of "cellophane" applied. This transparent dressing adheres lightly to healed burned areas, but if carefully removed does not damage the delicate new epithelium. However, no attempt at removal should be made until it begins to separate itself. The "cellophane" does not adhere to the unhealed areas, so that damage to the tissue, if the dressing must be changed, is minimal.

If the case is received so late that the burn is already frankly infected, a nicety of surgical judgment is demanded. One may try to convert an infected wound into a relatively clean one by prolonged and gentle irrigation (Bisgard *et al.*, 1942) and then rely on the bacteriostatic action of the sulphanilamide to keep the burn clean. Or saline compresses or a Bunyan-Stannard envelope (if available) may be used for 48 hours and the burn then again closed in the "cellophane" envelope.

Some of the patients in this series have arrived many hours after the burn was received and after a prolonged journey in a motor-lorry. In such cases I have usually applied the "cellophane" for 48 hours to avoid the trauma and distress of frequent dressings in an already exhausted patient. If on inspection there is a collection of pus in any one part, the overlying dressing is cut away and saline compresses are applied. The "cellophane" in the uncontaminated areas is left undisturbed and is in no way harmed or made soggy. Usually after 24 or 48 hours these infected areas are clean enough for the "cellophane" to be reapplied, and healing then occurs uneventfully.

#### Preparation of the Dressings

The "cellophane" sheets may be medicated, sterilized, and read for immediate use when needed, or the unguentum

sulphanilamidi (sulphathiazole has not been available to me) may be spread on the sterile sheets of "cellophane" just before their application. All types of transparent wood-pulp tissue have been used, and have all been salvage. The paper is sterilized by first dusting with talc and then autoclaving for 20 minutes at 15 lb. The talc is then dusted off and the "cellophane" is placed flat on a sterile towel and a thin layer of unguentum sulphanilamidi 10% is spread on. It is then folded four times, with the non-medicated surface to the outside. Several such pieces are sealed in a conveniently sized tin and are always available for immediate use.

#### First-aid Measure

It is suggested that the application of a powdered sulphonamide to the burn or wound, followed by the immediate application of "cellophane" sterilized by boiling, offers many advantages. It permits of easy and painless inspection of the burn when the patient reaches the centre and the ultimate treatment has to be decided, and does not in any way prejudice the form of treatment to be adopted. It would prevent contamination and be bacteriostatic to infection already present in the burn. A dressing of this type is available almost anywhere.

An even more simple measure which could be applied in very forward areas when no medical equipment is available should be considered. In such circumstances the "cellophane" wrapping of a cigarette package could be applied to the burn, for its inner surface is almost certainly sterile; such a dressing would be comfortable and adequate until the patient was able to receive further treatment.

The satisfactory results achieved in this series were, as stated, all in second-degree burns. In third-degree burns, as always, treatment should be directed to preparing the burned area for skin-grafting, and the dressing would be of temporary value only.

This paper is published with the kind permission of my officer commanding, Col. David Bell, O.B.E., E.A.A.M.C.

#### REFERENCES

- Allen, H. S., and Koch, S. L. (1942). *Surg. Gynec. Obstet.*, 74, 914.  
Bisgard, J., Dewey, and Baker, Charles P. (1942). *Ibid.*, 74, 20.  
Davidson, E. C. (1925). *Ibid.*, 41, 202.  
Ellis, M. (1943). *British Medical Journal*, 1, 697.  
Poth, E. J. (1942). *Surg. Gynec. Obstet.*, 75, 779.  
Siler, V. E. (1942). *Ibid.*, 75, 161.

## SYMPTOMLESS ENLARGEMENT OF THE OESOPHAGUS

BY

JOHN L. D'SILVA, D.Sc., M.R.C.P.

Assistant Physician, E.M.S.; Chief Assistant, St. Bartholomew's Hospital

Many cases of enlargement of the oesophagus are on record, but these have all been associated with symptoms which led directly to the investigation of the oesophagus. The condition occurs over a wide range of age groups, and is believed to be secondary to achalasia of the cardia or to organic obstruction of the lower end of the oesophagus. In the case now to be described there were no symptoms, and the condition was discovered as a result of the usual routine examination of the chest.

#### Case History

A commercial traveller aged 57 was admitted to hospital on Aug. 29, 1941, complaining of pain in the joints; a diagnosis of rheumatoid arthritis was made. He did not complain of gastro-intestinal symptoms and had never had dysphagia, unexplained vomiting, regurgitation of food, or pain behind the xiphoid. There were no respiratory symptoms and he had not lost weight.

On examination of the chest the only abnormality found anteriorly was slightly increased vocal resonance in the right midzone. Posteriorly, abnormal signs were confined to the right base, where vocal fremitus was lessened, the percussion note impaired, breath sounds vesicular but diminished in intensity, and vocal resonance reduced. Movements of both sides of the chest were equal and there was no evidence of displacement of the mediastinum. The blood pressure was 118/68.

A plain radiograph of the lung fields showed a triangular shadow extending to the right of the right border of the sternum from above the level of the aortic knuckle to the convexity of the right dome of the diaphragm. A barium swallow revealed a grossly enlarged oesophagus (see Fig.). The shape of the lower end of the organ



could be seen only in an oblique view. The oesophagus was grossly elongated so that it was obliged to kink, the kink resting on the right cupola of the diaphragm. The terminal portion of the tube narrowed gradually to pass to the cardia by a fairly narrow channel which appeared to offer considerable resistance to the passage of barium. Three-quarters of a cupful of barium emulsion passed into the stomach within 30 minutes, and peristaltic waves were observed emptying emulsion from the oesophagus into the stomach. In an hour a trace of barium remained in the lower end of the oesophagus.

The radiological appearances did not alter over a period of 15 months, and now, two years after the condition was diagnosed, the patient is symptom-free. A barium follow-through showed no abnormality of the stomach or colon (cf. Etzel, 1937).

### Discussion

Cases of dilated oesophagus described in the literature have usually been associated with achalasia of the cardia, a condition thought by Hurst (Hurst, 1914-15; Hurst and Rake, 1929-30), and also Rolleston (1896), to be due to an upset in the neuro-muscular mechanism in the region of the cardia. Hurst visualized food being propelled down the oesophagus to be held up at the cardia, which did not relax. In consequence the oesophagus dilated to accommodate the food, and in time this resulted in a permanent dilatation of the organ. There was no question of paralytic dilatation, because violent, frequent, and ineffectual peristaltic movements were observed in the oesophagus.

All cases of achalasia of the cardia which have been examined histologically have shown inflammatory changes and fibrosis affecting the ganglion cells of Auerbach's plexus (Rake 1927, and others). Many cases of achalasia are on record in which no histological examinations have been reported; but they are all cases which showed symptoms of obstruction, and there is no good reason to separate them from the above group.

It has been assumed hitherto that dilatation of the oesophagus in these cases was a consequence of the functional defect at the cardia, supporting evidence being some diminution in size following surgical relief of the functional obstruction. There is no record of an oesophagus normal in size before the onset of symptoms. This point is important because of the present case.

Apart from those cases with marked symptoms in which the diagnosis seemed probable on clinical examination alone, cases have been described with slight symptoms of obstruction but with well-marked radiographic changes (Shelburne, 1934; Belot and Nahan, 1936; Becquet, 1938); and a similar condition in children may be associated with considerable oesophageal dilatation (Rolleston, 1896; Cameron, 1927; Negus, 1936). Besides, there appears to be no direct relationship between the degree

of obstruction and the extent of oesophageal dilatation (Brown Kelly, 1912), and oesophageal stenosis due to a neoplasm or fibrous stricture may not be associated with gross dilatation.

In the case here described there is delay in the emptying of the oesophagus, but some barium entered the stomach very rapidly and each peristaltic wave was associated with the passage of barium. The degree of achalasia, if any exists, must be minimal; more probably the delay should be attributed to the tortuous course followed by the oesophagus.

In the absence of histological material for study it is difficult to assign this case to a definite group, but it differs from what has been described as achalasia of the cardia, in the absence of symptoms, the absence of any evidence of spasm, and the abnormal shape and length of the oesophagus. It is difficult to make a reasonable suggestion as to its cause unless the issue be evaded by ascribing it to a "congenital defect." Experimental evidence which might have a bearing on the aetiology of this condition is meagre, but the following observations should be mentioned:

(a) McCarrison (1919) has described the effects of chronic hypovitaminosis-B on pigeons. The changes in Auerbach's plexus resemble those found in achalasia. The state of vitamin-B saturation of this patient has not been determined, but he exhibited no signs of vitamin-B lack.

(b) Experimentally, in animals, bilateral vagotomy led only to a temporary absence of peristalsis (and hence delayed emptying) in the oesophagus (Cannon, 1906-7), but when the longitudinal muscle coat was stripped from the subdiaphragmatic portion enlargement of the oesophagus resulted (cf. Netto and Etzel, 1934). The latter operation always resulted in the simultaneous removal of Auerbach's plexus, thus providing some direct evidence that enlargement of the oesophagus can follow damage to this plexus.

The cause of the oesophageal enlargement in this case is therefore obscure; there is no direct evidence as to its aetiology, but a congenital defect of the longitudinal muscle fibres is possible.

I am indebted to Prof. R. V. Christie for permission to publish this case, and for his helpful criticisms of this paper.

### REFERENCES

- Becquet, R. (1938). *Arch. Mal. App. Digest.* 28, 388.  
Belot, J., and Nahan, L. (1936). *Pres. med.* 44, 1023.  
Cameron, J. A. M. (1927). *Arch. Dis. Child.* 2, 355.  
Cannon, W. B. (1906-7). *Amer. J. Physiol.* 17, 429.  
Etzel, E. (1937). *Gut's Hosp. Rep.* 61, 155.  
Hurst, A. F. (1914-15). *Quart. J. Med.* 8, 300.  
— and Rake, G. W. (1929-30). *Ibid.* 23, 491.  
Kelly, A. Brown (1912). *British Medical Journal*, 2, 1047.  
McCarrison, R. (1919). *Ind. J. Med. Res.* 7, 167.  
Negus, V. E. (1936). *J. Laryng. Otol.* 51, 100.  
Netto, A. C., and Etzel, E. (1934). *Rev. sud-am. Med. Chir.* 5, 395.  
Rake, G. W. (1927). *Gut's Hosp. Rep.* 51, 141.  
Rolleston, H. D. (1896). *Trans. path. Soc.* 47, 37.  
Shelburne, S. A. (1934). *J. Amer. med. Ass.* 102, 285.

## Medical Memoranda

### Alternative Method of Treatment for Late Cases of Strangulated Femoral Hernia

Owing to the very high mortality associated with late cases of strangulated femoral hernia it is of interest to describe an alternative treatment which has proved successful. While not in any way decrying the standard treatment, there are no doubt many late cases to which the technique to be described could be applied. These patients are very dehydrated and exhausted; therefore it is essential to keep to the minimum the amount of manipulation at any one time.

#### CASE RECORD

Mrs. A., aged 69, was admitted to hospital with a 5-day history of abdominal pain, vomiting, and increasing distension. Just before the onset of her symptoms a lump had appeared in the right groin, following a strain. On examination the patient looked very ill; temperature 99.8° F., pulse 110. Her face was ashen and appeared sunken, her tongue was dry and furred, and she was obviously very dehydrated. She complained greatly of thirst, and her mind seemed to be rather confused. There had been no action of the bowels for seven days. Examination of the abdomen revealed marked distension, with a large red tender swelling in the right groin, no doubt containing sloughing bowel and pus. Intravenous saline was begun immediately and the patient brought to the operating theatre. Under pentothal anaesthesia a small median subumbilical incision was

sulphadiazine; and penicillin, which may easily supplant sulphonamides in the not too distant future, is not even mentioned. Sulphathiazole is the drug recommended, and the optimum dosage is given as 4 g. daily for five days, with which few will quarrel; the giving of the drug continuously for ten days, even in reduced dosage, will meet with less general agreement. When failure of cure occurs with one or two courses of sulphathiazole, injections of large doses of gonococcal vaccine are recommended, such as 600 to 800 millions, combined with oral sulphathiazole; these should produce a local reaction four to six inches in diameter and an elevation of temperature of one or two degrees. If the author had met more of the really sulphonamide-resistant cases now occurring in various parts of the world he might usefully have said more concerning their treatment; when penicillin is not available they often are the despair of the venereologist.

One suggestion is that all pathological reports should, like serum tests, be returned as "positive," "doubtful," or "negative"; there is much to be said for this, especially if, as Dr. Herrold suggests, the pathologist adds any special remarks which are likely to be helpful to the clinician. The statement on page 88 under "Epidemiology" that "at least 10% of all infections in the male are followed by a two- or three-month period of infectivity, with few or no clinical symptoms" requires confirmation; if this means that 10% of apparently cured cases remain infective for two or three months, many venereologists would disagree. Apparently prophylaxis not only for Service men but for civilians is recommended; a warning is wisely uttered against the use of oral sulphonamides for this purpose. The last chapter contains 62 case histories illustrative of certain points, and there is a long list of references.

This is a useful but not outstanding publication; the subject lends itself rather to the form of a pamphlet, which can be reprinted frequently with amendments, than to a book.

### MEDICAL MYCOLOGY

*Elements of Medical Mycology.* By J. H. Swartz, M.D. Introduction by F.D. Weidman, M.D. (Pp. 190; large folding chart. 21s.) London: William Heinemann.

This is a very useful little book, and can be recommended especially to the laboratory worker. It makes a somewhat different approach to the subject from what is usual in medical works on this subject, for it adopts a botanical rather than a clinical attitude. There are useful tables showing the place of the various pathogenic fungi among the Fungaceae as a whole, and Dr. Swartz takes the trouble to define the various terms, such as sterigma, chlamydospore, fuseaux, etc., which may be familiar to the real mycologist but prove a stumbling-block to the inquiring mind of the ordinary doctor. These definitions are clarified by diagrams, and it must be added that the numerous photomicrographs with which this book is copiously illustrated are also a great help.

On the clinical side the author has given more consideration to treatment than to diagnosis, and there is a full discussion of the management of dermatophytosis, a subject which includes all the commoner forms of mycotic infection of the skin, such as "dhotie itch" and "athlete's foot," and the various "id" eruptions, which are manifestations of cutaneous allergy to an active focus of fungus infection. We are glad to notice that Dr. Swartz emphasizes the desirability of gentle measures in almost all cases. He mentions one remedy of which we do not remember to have heard before, and that is the inhalation of ethyl iodide; he says it is valuable in stubborn cases, but when using it certain precautions are necessary.

A very practical little book, and just as useful to most medical practitioners as many more expensive and ambitious volumes on this subject.

### Notes on Books

*The Road to Maturity* (Victor Gollancz; 6s.) is one of the best if not the best book yet published on the subject of sex education. As Sir Richard Livingstone says in the foreword: "It sees sex as a whole; as a purely natural phenomenon with definite physical facts and laws, and as a force involving some of the highest spiritual faculties of man. It makes the problem clear, suggests definite

methods for solving it." Dr. EDWARD F. GRIFFITH edits the book and himself contributes the framework. Several authorities, including those with practical experience as heads of both boys' and girls' schools, contribute chapters, and Dr. Noel Harris writes a chapter on psychological types. Perhaps the most valuable part of the book is Part 2, which comprises the text of three lectures given to boys of secondary school age, at puberty, at about sixteen, and just before they leave. Medical men and women have a very considerable responsibility both in giving sex education themselves and in advising others who may be called upon to do the actual job. They will find this book an enormous help in clarifying their ideas and giving valuable suggestions as to how to set about this difficult task. No doubt there is nothing that they will not have known before, but to know a subject and to put it across effectively are not the same thing.

An illustrated pamphlet, *Sokol: the Czechoslovak National Gymnastic Organization*, by F. A. TOUFAR, a member of the Sokol instructors' staff in London, has been published at 6d. by George Allen and Unwin. Here will be found an account of the origin and growth of the movement from a small gymnastic society into a national organization inspired by a powerful national sentiment.

The second edition of Dr. I. SIMSON HALL's book *Diseases of the Nose, Throat and Ear* was reviewed in these columns on Dec. 20, 1941. It is now followed by a third edition (E. and S. Livingstone; 15s.), for which the subject-matter has been revised and brought up to date and some new plates and diagrams added. A feature of the book is its illustrations, of which eight are coloured plates.

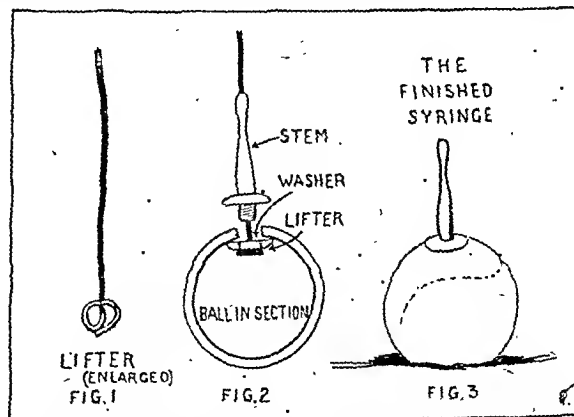
## Preparations and Appliances

### A RECONSTRUCTED EAR SYRINGE

Dr. PERCY TATCHELL writes:

When a rubber ear syringe wears out to-day it is rather hard to replace the rubber; but there are plenty of old tennis balls about. If a discarded syringe is pulled to pieces, a large washer will be found inside screwed on to the stem to keep the latter fixed; it is put there by the makers before the two halves of the ball are vulcanized up. The puzzle is how, having got the washer inside the tennis ball, to screw it on to the nozzle. At first sight this looks impossible, but the thing that makes it feasible is a piece of very soft wire about 6 in. long: copper would do, but electric fuse wire is ideal.

First burn a hole in the tennis ball with a red-hot iron of the right size to admit the screw of the stem—an old rat-tail file will answer the purpose. Next twist up a "foot" on the end of the wire to make a lifter (Fig. 1), of such a size as will pass



through the hole; and, having passed it into the ball, thread on the washer to the wire; then tipping the washer on end, still keeping it threaded, squeeze it through the hole, which has been compressed to a slit by side pressure. The washer will fall to the bottom of the ball, and lie on the foot of the wire lifter. By raising the wire the washer will be seen immediately under the hole. If the stem of the syringe is now also threaded on the wire, the appearance will be as shown in Fig. 2.

Pass the stem on down into the hole, and by wriggling the wire the threaded part will eventually be felt to engage in the washer; and having been previously soaped it can be easily screwed up tight: the slight pressure against the inner side of the ball prevents the washer from rotating. Then comes the great moment: a sharp pull on the soft wire; it straightens, and out it comes. (Fig. 3.)

If you are a little doubtful of the asepticity of the ball, it can be flamed and painted.

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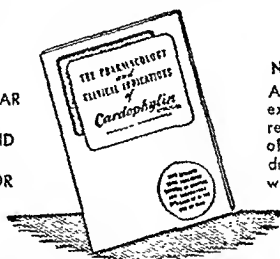
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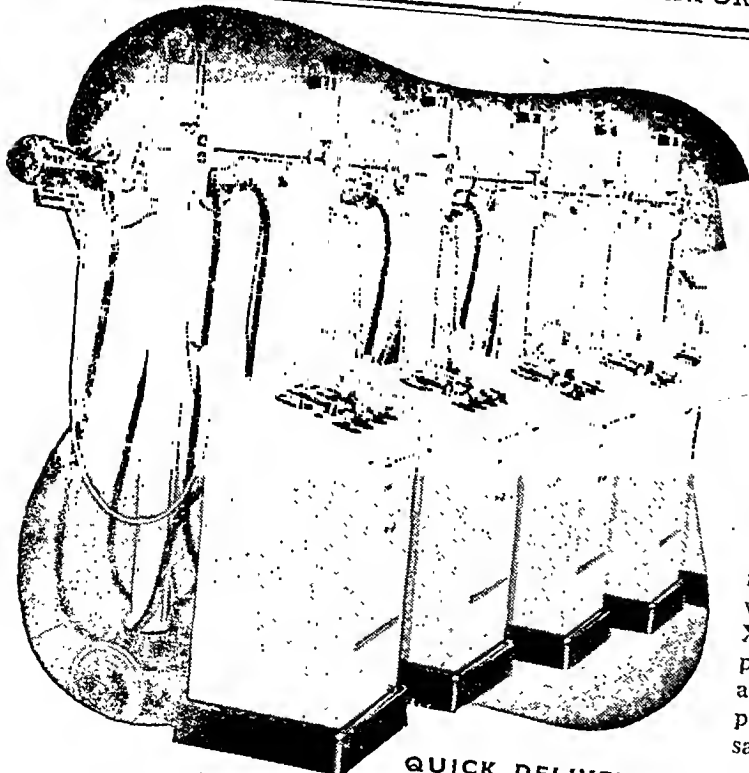
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## BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JUNE 3 1944

## SURGERY IN THE EIGHTH ARMY

In these days of momentous happenings some of the less spectacular achievements of our Army, which at another time would command much attention, are liable to fade into relative obscurity. For this reason a review of certain aspects of the work of the Medical Services with the Eighth Army during its advance from el Alamein to Italy, which concludes in this number of the *Journal*, is to be welcomed as a permanent record of an evolutionary phase in military medicine which presents many features of great interest. Brigadier Charles Donald draws a vivid picture of the scene from the point of view of a consultant surgeon who is as deeply concerned with questions of tents and beds, the location of skilled surgeons and nurses, and the optimum disposal of the wounded man, as with details of surgical technique.

Each theatre of war has its own characteristics which control its development and present it with its own peculiar problems. In this campaign sandstorms, heat, shortage of water, flies, mosquitoes, all played their part; but the dominating feature which, particularly in the African phases, influenced every decision and plan was the weary length of the communications. The further the Army advanced the longer became the journey the wounded man had to make to the base hospital, much of it in ambulance cars over open desert and tracks of a degree of roughness which beggars description and which made the journey an ordeal. This was brought painfully to notice in the pre-Alamein phases of the Middle East war, when fighting ebbed and flowed between the Egyptian frontier and Benghazi, and many lessons were learnt which found successful application in the period now under review. The most important of these was that surgery and other specialized treatment must be brought forward to the patient as near the fighting line as possible. This decision led to the development of mobile units, such as the surgical team (precursor of the modern field surgical unit) and the field transfusion unit, both of which worked wherever their services were required from casualty clearing station to forward field ambulance; and of other special surgical units which functioned up to casualty clearing station level. Casualty clearing stations, the most forward units with facilities for holding patients, had in their turn to acquire a hitherto unknown degree of mobility, and be prepared to move at the shortest notice. By splitting them into heavy and light sections further elasticity was attained, and units "leap-frogged" over one another in such a way that a continuous chain of staging posts was maintained from front to base. But it is not sufficient merely to provide surgery; it has to be the best surgery of its kind, for at

no other stage is skilled treatment so richly rewarded, or indifferent treatment more liable to be followed by complications and delay in healing, if nothing worse. Brigadier Donald wisely stresses the fact that military surgery in such surroundings, crude though it may appear at first sight to the new arrival from a fully equipped hospital working under peace conditions, is none the less an art in itself, in which skill and experience are just as essential to achieve the best results as in any other type of surgery. The policy of putting young surgeons through a term of apprenticeship in a base hospital under the tuition of officers with forward experience, and later in a staging post on the lines of communication, before passing them on to field units, is one that has much to commend it, as is the appointment of an experienced consultant to devote himself to the control of forward surgery, and to ensuring that the right man is in the right place.

As experience ripened, the build-up of an advanced operating centre forward of a casualty clearing station became more or less standardized as two surgical teams and a field transfusion unit attached to the main dressing station of a field ambulance (the new unit, the field dressing station, had not then been introduced in the Middle East Force). Of the special surgical units the orthopaedic team, because of the long periods its patients had to remain under observation and treatment, found no place in forward areas, where "all surgeons must be orthopaedists up to a point." On the other hand, an experimental grouping of sections of a maxillo-facial and a neurosurgical team with an ophthalmic team proved a striking success, and thereafter this "unholy trinity" were kept together, usually at a casualty clearing station, working in the closest co-operation and usually in the same theatre. Chest teams were not brought right forward, the policy being to maintain one at an advanced general hospital. With this chain of units disposed as close to the fighting line as circumstances would permit, the standard and scope of the treatment afforded to the wounded man reached a high level.

To the transfusion service Brigadier Donald pays a generous tribute. The officer of the field transfusion unit, working constantly in company with his colleagues of the surgical teams, in most cases took over the management of the pre-operative ward in addition to his duties as resuscitation officer, and became an integral part of the team. Such an arrangement has everything to recommend it. Perhaps the most valuable contribution which the transfusion service made to the advancement of its efficiency was the system of supply which it developed. It became apparent that distribution must be controlled by personnel specially nominated for this purpose, and a field transfusion unit, equipped with additional transport, was detailed to provide one or more "advanced blood banks" and to institute a "door-to-door" delivery of transfusion equipment and fluids. The results were eminently satisfactory. Mention might also be made of the "travelling transfusion" devised by Captain Lucas<sup>1</sup> which in many cases proved of vital importance in maintaining the condition of seriously wounded men in transit from one unit to another.

<sup>1</sup> *Lancet*, 1943, 2, 503.



With all these facilities available, and a lengthy line of communication stretching behind to the base hospital, the decision when to evacuate and when to hold the patient often became an acute one. Administrative officers, with their eye on future commitments, had perforce to urge evacuation where the surgeon, for the patient's sake, would fain have retained him. Compromise was effected, and selected serious cases, amounting to from 3 to 5%, were retained where they were operated on, while the remainder passed on down the chain of staging posts till the base was reached. The dictum that "no one is fit for the air who is not fit for the road" may surprise those whose experience of air travel is limited to peacetime conditions and who have visualized the smooth and rapid air journey as the ideal method of transporting wounded. In a forward area the disadvantages of air evacuation for the very seriously wounded lie not in the air journey but in the rough passage by road between hospital and aerodrome, and, once there, in the inevitable and often protracted delay, with limited nursing facilities, before the patient can be emplaned. Nevertheless many thousands of selected sick and wounded were transported to the base in this way. Air evacuation proved specially useful for post-operative patients who, though fit to travel, could not stand a prolonged journey.

To all who served in the last war it will be obvious that the conditions which then obtained in France and Flanders bear little or no resemblance to those in which the Eighth Army operated. One was a static war: the other essentially a war of movement, in which mobility, elasticity, and adaptability were the all-important keynotes. Though the operations which lie before us will no doubt cover the ground occupied in 1914-18, the *tempo* is more likely to be that of the mobile warfare experienced by the Eighth Army, so that their experiences and the methods which they developed are worthy of close study. Modifications designed to afford greater mobility and flexibility have recently been introduced into the structure and establishment of medical field units, and it can be confidently anticipated that the lot of the wounded man will be made easier by the application of the principles which have been defined and the methods which have been evolved in these recent campaigns.

### DEPARTMENTAL PRESCRIPTION

A recent pamphlet issued by the Ministries of Food and Health, with the approval of the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council, is entitled "Diets for Patients with Ulcers of the Stomach and Duodenum," and it is being sent to every general practitioner and to hospital staffs and others professionally interested. It deals with maintenance diets for patients with ulcers under wartime restrictions and not with the acute stage of the disease. Modern dietetic treatment of peptic ulcer is based on the work of Sippy, whose diets were high in milk and fat. Between the two wars a too-strict Sippy diet proved to be one of the most important causes of scurvy, and the diet was therefore progressively modified

by the addition of puréed vegetables and fruits and fruit juices. As a result the provision of frequent feeds of pul-taceous material, containing the essential nutritive principles and vitamins, became more important than a narrow preoccupation with the acid-lowering properties of milk and fats. This phase of development has undoubtedly eased the transition to the war period, during which milk is restricted to two pints a day, and eggs and fats are not freely available. This innocent-looking document does nevertheless raise certain major controversial issues, for the problems of dietetics in wartime soon bring us face to face with the control of a free profession. We are told that further copies of the pamphlet may be obtained from the Public Relations Division of the Ministry of Health, which is not a place medical men naturally turn to for information. A Public Relations Department is in effect a Government advertising agency, and advertisement, whether of patent medicines or Government Departments, is equally suspect to the profession. In fact, many doctors do not take at all kindly to instruction in the treatment of disease by the Ministry of Health or the Ministry of Food, as a letter in our issue of May 20 (p. 701) showed.

Wing Cmdr. Stanley Turner and his colleagues who signed the letter referred to perhaps rather overstate the case against the bureaucrat, who during this war has completely ousted Aunt Sally from popular disfavour. The two have one thing in common—not being allowed to defend themselves—and we think that the severe criticism of the Ministry of Food by Wing Cmdr. Turner and his colleagues might have been tempered with some recognition of the stupendous difficulties confronting the Ministry in this war and the phenomenal success which has attended its efforts in overcoming them. It is obvious that the doctor's freedom to prescribe diets for his patients in wartime is limited by the food that is available. It will be granted that in peacetime the prescription of a special diet is often the result of applying the art of medicine rather than of working according to the objective findings of the clinical pathologist and the biochemist. In the practice of medicine, where knowledge is so inexact, where, as Sir Thomas Lewis has put it recently,<sup>1</sup> "the idea that certain diseases are fully understood is an illusion," it is not necessarily a sign of wisdom to put more faith in the findings of the laboratory than in the observations at the bedside. Nevertheless in wartime the doctor, along with the rest of the population, has to submit to the administrator—and with as good a grace as possible. The administrator must necessarily try to grasp something which is tangible, and so will ask the practitioner who wants to have special rations for a patient with gout to give him some figures to go on—namely, estimations of blood uric acid. But the administrator is constitutionally incapable of understanding the point of view of the practising doctor, just as the latter also finds it difficult to see things through what appear to him to be the myopic spectacles of that fearful creature called the bureaucrat. Earlier in the war the Ministry of Food asked the doctor who wanted extra milk for his patient to hand the certificate to the householder, stating on it the disease the patient was suffering from. To get

<sup>1</sup> *Lancet*, May 13, p. 619.

the extra milk the householder had to pass the certificate to the milkman. That this procedure broke the professional confidence between patient and doctor, that it would entail endless personal embarrassment and distress to the tuberculous person whose condition would become divulged to the whole neighbourhood through the traditionally communicative milkman, quite plainly never occurred to the minds of the responsible officials issuing the order. A similar lack of imagination is behind the requirement to the practitioner to submit to a local food office the evidence of his diagnosis. The interval during which patient and doctor wait to have the diagnosis confirmed must be highly embarrassing to both. The disclosure of the condition diagnosed to the small chain of officials in the local food office must no doubt offer them a topic of conversation, and on a dull day no doubt a little harmless betting on the ultimate diagnosis transmitted through the usual channels might relieve the local administrative tedium. In wartime some control is necessary, but we refuse to believe that any system of control which is based upon distrust of the practising doctor can help either his patient or himself. Doctors rightly regard this sort of thing as intolerable. It is not possible to conduct the practice of medicine by orders, regulations, or departmental circulars.

All this is an illustration of what medical men at the moment fear from a projected national health service which would bring the control of the practice of personal medicine under local authorities and the Ministry of Health. We may be sure that the dietetic information in the pamphlet issued by the two Ministries is sound, because it comes from the Medical Research Council. But we question the justification for the issue of such a pamphlet by two Ministries which have no place in the field of personal medicine and which indeed in this case seem to be acting simply as medical publishers. But it is less for what it is than for what it portends that we debate this matter. Domiciliary medicine can never be efficiently practised on any other than an individual basis—that is to say, there must be complete freedom between the doctor and the patient to tackle a personal problem unobstructed by a third authority. There are already enough hindrances to the solution of the individual problem of the diseased person. There may be, first and most important, limitation of knowledge; secondly, there may be imperfect accord between doctor and patient; thirdly, there may be and often are all those obstacles to good health comprehended under the term "poverty." A fourth and formidable risk is that of making a mistake on a large scale. The individual doctor errs often enough, because he is constituted as his fellows are. But the kind of action now taken by the two Ministries, if persisted in in peacetime, may enforce and perpetuate error on a wide scale. Essentially, the control of the practice of personal medicine can be exercised through one channel only, and that is the channel of education; an education which must continue throughout the doctor's working life. And unless his conditions of work and the payment he receives for it provide him with time in which to read and reflect, then such an educative process cannot be continued; but the remedy is certainly not "medicine by circular."

### DUST IN THE FOUNDRY

The foundry has long had the reputation of being a dusty place, but it has been difficult to assess the extent to which it affects the health of persons employed in it. A report<sup>1</sup> published by the Industrial Welfare Division of the Department of Labour and National Service of the Commonwealth of Australia carries a stage further the work done in New South Wales by Dr. Charles Badham and his co-workers. The risk to the health of foundry workers consists in damage to the lungs by dust, and in view of the variety of processes involving exposure to different kinds of dust—including silica, silicates, iron, carbundum, and coal—and different concentrations of dust varying from moment to moment throughout the working day, the problem is complicated. The overriding difficulty of evaluation is concerned with the latent period before the evils of exposure show themselves in the form of recognizable pulmonary disease, whether as definite silicosis or as another form of pneumoconiosis. In this study measurement of the air-borne dust was made by taking snap samples with the Owens dust counter to provide estimates of the numbers of dust particles in a given volume of air; but the snap samples were taken at intervals during the series of phases in a process and the time periods measured for each phase. From these data an average exposure was calculated and expressed in terms of particle-hours per c.c.m. Thus, in a machine-moulding operation the mean particle concentration per c.c.m. varied between 100 and 1,605 in the different phases of the operation, and the duration of each phase varied between 70 and 480 seconds per hour. The resulting average exposure for this operation was 163.9 particle-hours per c.c.m. Similar observations were made at the seven foundries investigated, and comparisons could be made to indicate the relative risks as between operations, phases of operations, and these carried out in the different foundries. The operations studied in this way included moulding, shaking-out, sand-conditioning, and cleaning of the castings by blasting, rumbling, brushing, grinding, and chipping. For determining the composition of the air-borne dusts samples were collected by means of the Greenburg-Smith impinger, and these were submitted to chemical analysis. The most important single result of these analyses was the determination of the proportion of free silica in the dust. From observation of the lay-out, plant housekeeping, and ventilation provided in the seven foundries included in this study, and from the data obtained from the dust estimations and analyses, it is suggested that a dust exposure of 500 particle-hours per c.c.m. is a practical working standard for the foundry industry, with the proviso that where the dust contains more than 50% of free silica the average exposure should not exceed 200 particle-hours per c.c.m. It is not suggested that this standard would obviate any danger of developing silicosis or fibrosis, but that by its adoption the working conditions in foundries will be vastly improved.

This technical study was not expected to give an indication of dust concentrations which could be regarded as safe for workers; this is a medical question, and a statement on safe conditions could best be made as the result of a correlation of such dust estimations with medical examinations of workers who had been engaged for suitable periods of employment in the different processes, arranged to give satisfactory statistical data and to include clinical and radiological examinations.

<sup>1</sup> *Dust Hazards in Australian Foundries*, by A. A. Ross and N. H. Shaw. Technical Report No. 1, Industrial Welfare Division, Department of Labour and National Service, Commonwealth of Australia, 1943.

## DIAGNOSIS AND TREATMENT OF DELINQUENCY

Since its foundation in 1932 the Institute for the Scientific Treatment of Delinquency has made steady progress. Dr. Edward Glover, the chairman of its scientific committee and a co-director of its psychopathic clinic, has reported on its work during the five years from 1937 to 1941 in a pamphlet entitled "The Diagnosis and Treatment of Delinquency" and published by the Institute. It forms a chapter in *Mental Abnormality and Crime*, the second volume of "English Studies in Criminal Science," to be published shortly by Macmillans. Most of the cases come from the police courts, but a large number are referred by medical practitioners, other psychological clinics, and philanthropic societies. The Institute has had to contend with many obstacles. During the "blitz" a time bomb put the clinic out of action for several weeks and ultimately forced it to move; all the juvenile courts but one closed for a period; war work made it extremely difficult for probationers to attend for treatment during the day; and many of the most active members of the staff went to the war. The work has, however, been continued. Each patient is seen as soon as possible after referral, by a psychiatric social worker, a medical psychologist, an educational psychologist, and a physician—also, if necessary, by another psychiatrist, a vocational guidance officer, and a variety of organic specialists. The director co-ordinates the various findings and gives his provisional diagnosis in non-technical language for the court or whoever else has referred the patient. He keeps constantly in mind not only the difficulty magistrates may have in giving expression to the essentially clinical findings of the Institute, but also the practical difficulties court officials may encounter when seeking to administer court decisions. The patient's need of psychological treatment may conflict with the need for segregation or close supervision; the patient may require psychological treatment and at the same time special employment which he cannot get near the clinic. Many of these difficulties could be overcome by the provision of hostels under the Institute's control. The ultimate disposal of the patient is a matter for the court, and even if the court acts on the recommendation of the Institute treatment may be prevented by social or domestic obstacles. In 1940 and 1941 a little over half the new cases were recommended treatment, but hardly one-third actually received it. Nevertheless, each year an increasing number of delinquents are put on probation with the condition that they undergo psychological treatment. The number of school children sent to the clinic has grown apace, many of them having been returned from reception areas as "unbilletable." They have mostly been placed in new or more suitable foster homes, preferably within reach of a child-guidance clinic. Much of the actual work of disposal is done by the psychiatric social worker, Miss M. Wilcox. This work has real therapeutic value, and staff permitted could be amplified in almost every direction. The figures for results show a recovery rate of about one in ten and an "improved" rate of about two-fifths of those discharged, but the number of discharges through circumstances outside the control of the clinic is very high.

Taking everything into account, the Institute's work is clearly justified and admirable. Dr. Glover declares that it is urgently necessary to enlarge the technical and administrative staff. Apart from that, the usefulness of the Institute would be greatly increased, he says, by a variety of extensions of activity: the provision of a suitable hostel in London, the organization of an observation centre outside London, a scheme of special staff training, research, team conferences, and seminars for magistrates and clerks. All this, however, requires money and exten-

sive publicity. The Institute finds it harder to achieve a sound economic basis than to overcome the difficulties of its work. Reliance on voluntary contributions now limits its usefulness, and the time has come when the contribution it is making to society should be recognized by an adequate grant from public funds.

## THE PHARMACEUTICAL SOCIETY'S COLLEGE

The Pharmaceutical Society has published a report of research work carried out in its College during the period January, 1942, to June, 1943. As in other research institutions the staff and the facilities for investigation have been seriously diminished by the war, but nevertheless the report indicates that much useful work continues.

Perhaps the most interesting development from the medical point of view concerns the hormone of the suprarenal cortex. Dr. Marthe Vogt, in the department of pharmacology, has succeeded in demonstrating the presence of cortical hormone in blood taken from the dog's suprarenal vein. She measures the amount of hormone in blood by its power to prolong the life of young adrenalectomized rats exposed to low temperature, the prolongation being proportional to the amount present. Dr. Vogt finds the hormone in blood from the suprarenal vein, but not in arterial blood or in blood from the right side of the heart. The amount of hormone issuing from the gland is large. One millilitre of a commercial extract of suprarenal cortex contains the activity present in 75 g. gland, yet the average output of hormone from one dog's suprarenal gland per minute per kg. of body weight was equivalent to 0.6 g. gland. Assuming a dog of 10 kg. with two suprarenal glands, this means that a dog liberates in its blood activity equal to 1 millilitre of commercial extract in so short a period as 6 minutes. It is not a matter for surprise, therefore, that clinicians find cortical extract to be weak or transitory in effect. This work opens up a new approach to the study of the cortical hormone which promises to be extremely fruitful, and the Pharmaceutical Society is to be congratulated on this important development. Another investigation of much technical difficulty carried out by Dr. Vogt concerned the pathway of the impulses which lead to ovulation in the rabbit. The rabbit ovulates within a few hours after copulation, and ovulation is due to a secretion from the anterior lobe. What is the path of the nervous impulses set up by the act of copulation which cause the discharge of this secretion? Earlier work showed that the sympathetic is not involved. Experiments in which the greater superficial petrosal nerve was destroyed on both sides have now been carried out and have shown that this channel is not involved either. Probably, therefore, the anterior lobe is innervated, like the posterior lobe, by way of the supra-optico-hypophysial tract.

In the department of pharmaceutical chemistry further studies on acridine compounds have been made under Dr. W. H. Linnell's direction, and a number of chloro-derivatives of amino-acridines have been prepared for the first time. They were, however, less active as bactericidal agents than the amino-acridines from which they were prepared. Work has also been done on isomers of stilboestrol, and on derivatives of chlorocresol in the hope of finding a powerful water-soluble disinfectant. Hand in hand with this work the department of pharmaceuticals under Mr. H. Berry has investigated the variation in the bactericidal value of lysol according to the soap used to dissolve it.

We much regret to announce the death of Sir Cuthbert Wallace, Bart., K.C.M.G., C.B., former President of the Royal College of Surgeons of England and consulting surgeon to St. Thomas's Hospital.

## RESEARCH AND GENERAL PRACTICE THE END-RESULTS OF TREATMENT

BY

C. E. S. FLEMING, M.R.C.S.

On all sides we are being told that, in order to improve the country's medical services, medical research should be greatly increased and advanced. Subsidized by the Government, this would demand buildings, equipment, specially qualified investigators, all at a considerable cost. There is, however, possible another form of research, requiring none of these adjuncts, only approval, keenness, aptitude, and opportunity. It is an intensive inquiry into subjects which general practitioners have peculiar opportunities for investigating, and it could be undertaken by them in conjunction with their everyday practice. The work would not, of course, be in any way compulsory or a duty; just another facet in the many-sided outlook of a doctor's life, an outlook that has been casually used by most of them, but not methodically or persistently—the working out of problems that occur almost daily. It is a desire for a further and more complete knowledge about much that confronts the practitioner, which though latent in all his work has not been generally recognized as coming definitely within the ambit of his practice.

A form of research that must of necessity be observational is apt to be depreciated as not being truly scientific, yet it has in the past yielded results very valuable from the clinical point of view. As a study it must develop naturally and by degrees, fostered by a doctor's desire, with the encouragement, inspiration, and assistance of teachers, hospitals, laboratory workers, and others.

### The Patient at Home

When a doctor starts practice he finds it difficult to recognize his patient as the same that he knew in the ward in charge of a nurse. He finds him and his family living under conditions he really knew little of—quite a new problem. He wonders whether the treatment he has seen succeed in the ward can be properly and successfully carried out in the patient's home. He begins to doubt, wants to know more of the condition that may influence his treatment, the chance of direction given in regard to rest, quiet, diet, and so on being properly carried out. He wants to know not only all the factors of the experiment which he considers every treatment to be, but also the result—the real tested result—of the experiment.

There must be many in like perplexity—men willing and with the aptitude to make inquiries and evaluate the results. For it is the family doctor more than any other who has the opportunity not only of seeing the very beginning of disease and what led to it but also of proving the real value, the end-result of treatment, and who, living as he does in close contact with his patients, is most likely to deplore the too-frequent failures of treatment and want to know the reason for this lack of success.

### Need for Purposive Search

We do not want mere collectors of information, but men with a purpose in their inquiry, to synthesize teaching and hospital practice with private practice and explain unexpected and unsatisfactory results of treatment—the imprecision of such research may offend the sensibilities of the expert researcher, but to call it an "inquiry into" would be too reminiscent of a "Committee of Inquiry," which is the last thing wanted.

There must be, in the profession, many men of original mind thinking at times of the rightness of what they once doubted, now that they are free of the dominating influence of authority, wanting to prove it right or wrong, wondering whether their garden may not have grown too many useless plants for want of deeper digging when they could be thrown out, making room for something better, of more real value.

The younger men with unfaded aspirations and ideals will be the most likely to realize the need for more intensive inquiry as to the real value of their daily work, and among

these we may fairly look for original researchers. Their opportunities, if available, would be great—men with the mental capacity and aptitude who would, if they could, devote more time to so fascinating a study, but they have too often been prevented by the rush of work necessary to make a living. Some have, in spite of all, succeeded. Such a one was that great example Sir James Mackenzie, the general practitioner whose original clinical research was of value without measure. He is described by a biographer, Sir Thomas Lewis, as "an exact observer, with accurate deductions, a deep-rooted distrust of authoritative statement, originality of mind, determined in purpose, a real investigator"—a fine ideal for the humblest researcher.

### Appraisal of Failures and Fashions

Among the many subjects not only suitable but asking for investigation by the family doctor one may well put the results of treatment, especially the failures, as they are not so freely proclaimed, and it is necessary to examine them because if any sort of treatment is found to be useless it should be discarded, for so long as it is available or made use of, it prevents search for the really effective. The warning of a wrong path may save trouble or even disaster. It is the family doctor who has the most likely opportunities of observing the effectiveness or ineffectiveness of treatment, and it is the ultimate results that we want to know, because what seems to be early success may yet end in failure. With a new carburettor in your car you are not satisfied with a trial run on the level road: you want to test it up hill and under all sorts of conditions, its effect on fuel consumption and speed.

Inquiry into the results of therapeutic agents requires much care, and detachment from empirical, unproved, but fashionable agents. Under "treatment" should be included the important but as yet undetermined position of psychotherapy in adults, a field clearly for the observation and criticism of the family doctor, who can probably best estimate its ultimate value in actual practice. Treatment by the surgeon we assume may be readily appraised, probably so generally; but here again fashion or custom, or plausible advocacy, has sometimes overstated the case and prejudiced some such practice as the fixing of movable kidneys, excising feet of colon, for conditions which would not now be thought to require it, and, in a somewhat different category, the numerous cases of gastrectomy and gastro-enterostomy. These and other questions of surgical treatment, some too recent to-day for fair criticism, might with advantage to all be the subject of general practitioner inquiry as to not only ultimate failure but later unwanted and unexpected after-effects, or even harm.

### A Wide Field for Inquiry

This list of possible matters for inquiry as to their influence on the result of treatment is getting too long, so there can only be mentioned old age, heredity, economic and domestic and social conditions, housing, with all of which the general practitioner in particular is concerned, and the import of which, as affecting treatment, he has such a special opportunity of ascertaining. The doctor meditates on all these things, but has no time, if he has the incentive, to carry his meditations a stage further, though he probably compares the findings of actual practice with his textbooks, and attempts to draw conclusions as to the reality of "cause and effect."

These suggestions are merely tentative. Research to be of real use and effective will need to be more methodical. One can contemplate a doctor, when he has time, carrying in his pocket a small notebook, entitled "Clinical Research," in which he will note when he comes across a case of failed treatment: The case; the remedy, medical or surgical; how applied, under what conditions and surroundings; failure, immediate or remote; the reason; the lesson. For want of time this would be impossible under existing conditions of practice.

Although such research as here proposed must be individualistic, it would be better that it should be by groups of congenial workers, for there would have to be considerable numbers of separate observations, and the comparison of findings by the different members of a group would help to suggest errors and new points of observation. Eventually these might be not masses of records but collective opinions; and

other groups investigating the same subjects might, with the assistance of expert researchers, integrate their deductions as to causes and results, opinions, new outlooks, new ideas, and, better still if one could be found, the expert researcher might give advice as to the method of inquiry.

The suggested list of subjects for inquiry is merely intended as a reminding note to those who have been so long and are still striving so hard for success in treatment in spite of disheartening conditions, that still more striving will yet be demanded in their endeavour to find reality.

### The Day's Work, and Beyond

If even this simple form of research is to be undertaken it can only be done if the doctor has time to do all his work deliberately; anything less than this means that whatever his duties, whatever his pay, whatever system he works under, the public will not, cannot, be receiving the best possible medical service. If the public realized how unsatisfactory some treatment is from the doctor's point of view they would not remain so complacent and satisfied with what they are getting as they now are.

A general increase of research into the results of practice might increase the quality but not the quantity of the general practitioner's work. Some diversion from routine is wanted to help him to look beyond the day's work, which has been carried on under such serious difficulties, with little encouragement, often disillusion and disappointment. He wants something to encourage and help him to think originally, independent of fads and fashions, of patients and employers, some release from drudgery. Temporary relief comes to some by outside hobbies, but something within the sphere of his profession may add zest to his everyday round—may give a wider interest within his work for the better enjoyment of his professional life and for the benefit of his patients and of medicine.

The outcome of this should be of some interest or even value to specialists and consultants as well as other practitioners. It is a long view of what might be done, an idea that it is hoped others much more fitted may approve and help to develop.

### SMOKE CONTROL IN GREATER LONDON

Representatives of 67 boroughs and other municipal authorities, members of the Greater London Advisory Council for Smoke Abatement, met at the House of Commons on May 8 to consider the reduction of smoke in post-war London.

The conference was opened by the Minister of Health, who said that great areas of London would not look as they do if it were not for the smoke of the past and the present. He reminded the conference that the Government had not been inactive. Between 1919 and 1923 there was an improvement of about 50% in the deposits dropped on London. Then there was a stationary period and some deterioration, but between 1935 and 1939 there was again an improvement. He was very glad to find this revival of activity on the part of both that organization and the National Smoke Abatement Society and the realization of the fact that this was now the time to move. He hoped that their campaigns of education would be successful. He would be glad to do what he could in the field of research and in collaboration with the Ministry of Works and the right sort of standardization. In regard to post-war housing they had to face a limited supply of naturally smokeless fuels and a relatively small supply of carbonized fuel. There were also considerable difficulties now in regard to the better cleaning of coal. The direction in which one hoped for progress was in the manufacture of a really satisfactory improved grate which would burn raw coal more completely and would also burn smokeless fuels satisfactorily. There was no escaping the fact that the British public liked an open fire, and what they had to achieve was a fire which would be equally attractive, was economic, and would not need continuous watching. From all the expert opinion he could get it would not seem that research in this direction had yet reached finality. The departments concerned were very interested in the matter, and there was every reason why they should be because the loss of all kinds due to smoke was very great indeed. The building in which they were meeting had suffered terribly from atmospheric pollution.

The Minister continued that his Ministry, together with the Ministry of Works and the Ministry of Fuel and Power, were agreed that there should be efficient domestic heating appliances and practical methods of smoke prevention. During the summer the Ministry of Works would issue a housing manual in which the latest available knowledge on the subject would be given. He was anxious to do all he could to avoid smoke in the new suburbs and prevent the continuous spoiling of the centre of our cities.

### SCOTTISH SCIENTIFIC ADVISORY COMMITTEE

The terms of reference of the Scottish Scientific Advisory Committee have been revised and are now as follows: "To advise the Secretary of State on the application of the results of scientific research to public health administration and to promote medical investigations designed to assist the Secretary of State in the discharge of his responsibilities for the health services in Scotland."

Membership of the committee has been widened in the interests of medicine generally and includes: Sir John Orr (chairman), Prof. D. Cappell, Prof. F. A. E. Crew, Prof. E. W. H. Cruickshank, Prof. D. K. Henderson, Prof. J. Hendry, Sir A. S. M. Macgregor, Prof. T. J. Mackie, Prof. J. W. McNee, Prof. C. McNeil, and Prof. Noah Morris. Dr. I. N. Sutherland of the Department of Health for Scotland is medical secretary. Normally the appointment will be for four years, but to provide for rotation five of the members now appointed will retire after two years. The chairman of the Medical Advisory Committee (Sir John Fraser) and the secretary of the M.R.C. (Sir Edward Mellanby) are *ex-officio* members of the committee but are not subject to the rules of retirement.

One of the new committee's first tasks will be an investigation into the causes of infant deaths from infections. In making this announcement Mr. Tom Johnston recalled that the reports of the original committee, which was due to retire in 1940 but was kept in being because of the war, on the Emergency Bacteriology Service and the Blood Transfusion Service paved the way for setting up services that had worked smoothly and efficiently. The results of an investigation into the health and working experience of 1,000 Scottish men and women who had been boarded out of the Forces were incorporated in the Department of Health's booklet *Experiments in Social Medicine*, while an earlier report on maternal mortality (in 1935) formed the basis of the Scottish Maternity Services Act, 1937. It was likely, he said, that the subject of mental deficiency might be referred to the committee for inquiry and investigation later.

## Medico-Legal

### A PENSION FOR TUBERCULOSIS

Originally workmen's compensation was intended to be payable only when a workman suffered injury or death by accident but quite early in the history of the Acts the House of Lords held that anthrax was an accident causing injury. Lord Halsbury, Lord Chancellor, said: "When some affection of our physical frame is in any way induced by an accident we must be on our guard that we are not misled by medical phrases to alter the proper application of the phrase 'accident causing injury,' because the injury inflicted by accident sets up a condition of things which medical men describe as disease." The same principle was recently applied in construing another Act.

A policeman was discharged from the City of London Police Force for pulmonary tuberculosis, and applied for a special pension for life under the Police Pensions Act, 1921. This provides that every member of a police force incapacitated by infirmity of mind or body occasioned by an injury received in the execution of his duty without his own default shall be entitled to a pension. The police authority the Common Council, would not allow him a pension, but quarter sessions overruled it. The Council appealed to the Divisional Court submitting that tuberculosis was not an injury under the Act, and that there was no evidence that the policeman had contracted it in the execution of his duty. The court<sup>2</sup> unanimously found in his favour, and Mr. Justice Humphreys said he was not aware of any legal principle or canon of construction which should prevent tuberculosis from being described as an injury occasioning infirmity of body. When the courts disallow claims of this kind for workmen's compensation, the reason is not the absence of proved injury but the failure to identify any event which could, however loosely, be called an accident. Under the Police Pensions Act there is no need to prove an accident; the injury is sufficient, and the court were quite clear that the tuberculosis was an injury. On the question of fact, the learned judge admitted it would probably be impossible to establish by evidence the day, week, or even month during which the infection of the lung occurred. The court, however, was not required to decide the issue of fact, but merely to be satisfied that quarter sessions had had some evidence on which they could conclude that the injury had occurred in the execution of the man's

<sup>1</sup> *Brintons v. Turvey*, 1905, A.C. 230.

<sup>2</sup> *Garvin v. Police Authority for the City of London*, (1944) 1 All E.R. 375.



duty. Where it is shown that the conditions of service during the critical period were such as to cause unusual mental and bodily strain which, acting upon a frame ordinarily healthy but at the time enfeebled by long hours of duty, frequent wettings, and such hardships, rendered it more liable than usual to infection, the judge thought the injury might be described as the direct result of the duty and therefore suffered in its execution.

## Reports of Societies

### MILITARY ORTHOPAEDICS

Of special interest at the spring meeting of the British Orthopaedic Association, which was held at Leeds on May 12 and 13 under the presidency of Mr. St. J. D. BUNTON, were several short papers on orthopaedics in military centres.

#### Cartilage Operations and Rehabilitation

Major R. H. METCALFE, speaking on the indications for and results of cartilage operations, said he had studied two large series of cases in two consecutive years (1942, 1943) in the same military hospital. In the first year 600 knee-cartilage cases were seen in the out-patient department; 100 of these patients were admitted to the wards, and 60 of the 100 were operated upon. In the second year 800 cases were seen, 170 were admitted, and there were 100 operations. A follow-up showed that during the first year the average time off duty for those who were operated upon was nine weeks; their final grades were: A 60%, B 28%, C 8%, E 4%. The commonest cause of a bad result was abnormal antero-posterior mobility, which was not, in the majority of cases, the result of operation; other causes were osteochondritis and osteo-arthritis. The first year's results suggested that rehabilitation had been too vigorous and tended to arouse latent anxiety. Patients were more carefully selected for operation in 1943, and given a shorter period off duty and less vigorous rehabilitation. By getting the soldier back to his unit within the permitted period of three weeks before being "Y" listed the best results were obtained. This was possible in 20% of all the cases operated upon in 1943; these men were graded: A 81%, B 14%, C 5%, and none had been discharged. For the entire 1943 series the final grades were A 71.5%, B 20.5%, C 7%, E 1%.

#### Fractures of the Scaphoid

Major J. STEWART, U.S. Army Medical Corps, in a paper on fracture of the carpal scaphoid, said this fracture was often undiagnosed, and he emphasized the need for multiple radiographs on different occasions in doubtful cases. Difficulties were experienced in distinguishing new from old fractures and in estimating the nature of vascular changes. The end-results had been ascertained in 134 cases out of a series of 205 treated within 15 months; of these 134, 129 had been treated in plaster alone, of which 127 had full union and mobility, freedom from pain, full grip, and had returned to full duty. The procedure was immobilization in plaster-of-Paris, extending from the base of the thumb-nail, the proximal palmar crease, and the heads of the metacarpals behind to within one inch of the elbow-joint. The wrist was maintained in 10 to 15 degrees dorsiflexion, but with no lateral deviation. During the application of plaster the thumb and fingers were held as though grasping a football; this allowed full mobility of the fingers afterwards and practically normal activity for the hand. Recovery after the plaster was removed was shortened (nearly four weeks). The plaster was changed every three or four weeks, and progress checked by x rays, care being taken to prevent movement of the wrist and thumb during these procedures. Every sprain or injury in the region of the carpal scaphoid should be considered a fracture until proved otherwise. Solid bony union in an average of eleven weeks could be expected if there were early diagnosis, accurate reduction, and adequate immobilization for a sufficient period. Loss of Army man-power due to delay in union was directly attributable to failure to observe these principles. In fractures coming late for treatment the time of recovery was prolonged, but neither vacuolation nor sclerosis at the site of

fracture, provided the proximal fragment was viable, need be regarded as vitiating recovery by prolonged fixation.

#### March Fractures

Capt. E. WYNNE-JONES found that the incidence of march fracture of the metatarsal bones in Army recruits was 2.8%, and occurred towards the end of training in men generally of poor physique and posture with long narrow feet, and where there was mechanical overloading of the metatarsals. By a more careful gradation of route marches the incidence of these had been reduced to 0.91%. While immobilization in plaster gave satisfactory results, a simpler and more time-saving method was a metatarsal pad applied to the foot with adhesive strapping. Modified training (everything except roadwork, running, jumping, and obstacle-course work) was started immediately and continued until all tenderness had disappeared (average 21 days).

Two other papers dealt with operative techniques. Lieut.-Col. GLEN SPURLING of the U.S. Army Medical Corps described the use of finely drawn tantalum wire for nerve suture, and of tantalum foil as an enclosing sheath at the line of junction so as to prevent adhesions. This metal, besides being malleable and having tensile strength, was completely inert to living tissues. Capt. D. KILLORAN, U.S. Army Medical Corps, described a method of coagulum contact skin grafting similar to that reported by Sano of Philadelphia, but with modifications necessitated by lack of heparin. From oxalated blood, plasma and a leucocyte cream were prepared; the former is applied to recipient areas and the latter painted on to the deep surface of the graft. This procedure was adopted in battle casualties a few days after initial débridement and where there were no other means of closing a large skin defect. The limbs were then immobilized, but pressure dressings were not applied. Lieut.-Col. BRICKER thought there was some doubt as to how far such a coagulum glue could replace suture and pressure fixation of the graft; certainly it was a useful adjunct. He said that grafts should not be washed in saline before application, as such procedure removed natural adhesive.

#### Miscellaneous Papers

Prof. A. DURWOOD described his researches into the blood supply of nerves; these confirmed the importance of the longitudinally disposed intraneural vessels, which freely anastomosed and conveyed blood for long distances within nerves, even after division of the many small vasa nervorum which enter laterally. Discussing the characteristic histology of benign giant-celled synovioma of tendon sheaths Prof. M. J. STEWART said that the intracellular presence of haemosiderin or lipoids was merely a demonstration of phagocytosis by the polymorphous connective-tissue cells of which the tumour was composed. The presence of foam cells did not justify the description of certain of these tumours as "xanthomas"; in fact the "xanthic" reaction wherever seen was a local phagocytic response by connective-tissue cells to the chemical conditions of their surroundings. Dr. A. S. JOHNSTONE reviewed the work of Batson of Philadelphia on the vertebral venous system as a mechanism for the spread of metastases and his own investigations along the same lines. He said that while there was a freer connexion than was commonly recognized between the veins of the prostate and those of the vertebral column, and while the vertebral venous system might provide a means for some of the occasional spread from this and other organs, it by no means accounted for the spread of cancer by the classical means already accepted.

Dr. J. R. NUTTALL described the results of treatment of osteo-arthritis by deep x-ray therapy in 259 cases, 164 of which had been followed up. There had been no particular selection of cases for treatment. He found 17 patients who had had complete relief of pain three months after treatment ended, 90 had incomplete relief, and 57 received no benefit at all. His impression was that the best results were obtained in smaller joints. Mr. L. N. PYRAH reviewed a series of ten cases of generalized osteitis fibrosa, six of which had been admitted for spontaneous fracture. All of the patients were found to have parathyroid tumours, which were removed. In discussing blood calcium in such cases Mr. Pyrah emphasized that reliance was placed entirely upon blood calcium and phosphorus estimation,



except in one case in which calcium-balance experiments had been carried out. The blood calcium figure varied from 12.5 to 20 mg. per 100 c.cm. of blood, and the blood phosphorus in every case was low—usually 2 to 2.5 mg. The plasma phosphatase was raised in every case.

Mr. R. BROOMHEAD and his colleagues demonstrated a series of orthopaedic cases, including a group of people who had been operated upon for intractable metatarsalgia. At the operation the shaft and head of the metatarsal was denuded, and, after being osteotomized near its base, was rotated through 180 degrees.

The Indian Association for the Cultivation of Science recently founded a gold medal in memory of Dr. Binola Churn Law. In accordance with the terms of the endowment the medal "is to be bestowed on a person who, in the opinion of the committee of management, has made conspicuously important contributions to science, including medicine." The committee of management, under the chairmanship of the president of the association, Sir U. N. Brahmachari, decided in November last to make the first award of the medal to Sir Henry Dale, President of the Royal Society, by whom the medal has now been safely received. At a meeting of the Association for the Cultivation of Science on Feb. 4 Prof. A. V. Hill, biological secretary of the Royal Society, was awarded the Joykissen Mookerjee Gold Medal for 1944, and delivered an address.

The Easter Holiday course of the Ling Physical Education Association was attended by over 500 teachers, inspectors, and others, and the subjects discussed included health education in schools and clubs and social science in the physical training colleges, while there were lecture-demonstrations on rehabilitation of the injured, rehabilitation of children in occupied countries, and ante- and post-natal exercises. Mr. R. Watson-Jones, speaking on developments in orthopaedics, said that years ago it was thought sufficient to mend broken limbs; later re-education in muscular control was found equally necessary, and physiotherapy came into its own; now the psychological factor was considered of equal importance. He reminded his listeners of Plato's policy that there should be physicians for the body and physicians for the mind; they were indivisible. Lieut.-Col. J. W. T. Patterson described the Research Board for the Correlation of Medical Science and Physical Education, which, founded last year under the chairmanship of Brigadier Frank Howitt, was at work on a report on the co-ordination of the work of doctors and physical educationists in maternity and child welfare, education and recreation, the Services, and industry; it had also appointed a special scientific advisory committee, under the chairmanship of Sir Farquhar Buzzard, to collate and assess scientific research on the subject which had already been made and to initiate further research.

## Correspondence

### Infective Hepatitis

SIR,—In a recent account of infective hepatitis (Cameron, J. D. S., *Quart. J. Med.*, 1943, 12, 47, 193) the author, referring to myself, writes: "He still considers that there are two types, catarrhal and infective jaundice." That statement is incorrect. In the article of mine to which he refers (Cullinan, E. R., *Proc. roy. Soc. Med.*, 1939, 32, 933) I said I did not believe that there was convincing evidence that common infective jaundice, as seen in Britain, had two separate pathologies, and that if the two conditions did exist I regarded them as clinically indistinguishable from each other. Later experience in the Middle East and East Africa has strengthened and widened that belief. My reason for writing this letter is not to cavil at an obvious misprint—the author did not have the opportunity to read the proofs—but because occasional attempts to differentiate clinically what is now called infective hepatitis into two diseases are again causing confusion. For example, an article has appeared in the German press (Mancke, R., and Siede, W., *Münch. med. Wschr.*, Nov. 6, 1942, No. 45) entitled (translated) "The Differential Diagnosis of Catarrhal Jaundice and Epidemic Hepatitis." The authors consider that if all the symptoms are taken together these two diseases can be distinguished clinically from each other. Briefly, their distinction is as follows:

**Epidemic Hepatitis.**—Two-phasic disease. The first stage is a heavy general infection with fever lasting 4 to 6 days. During this

stage the liver is enlarged and very sensitive to pressure. The spleen may be enlarged. Urobilin is increased in the urine. Vomiting is a regular feature. Obstinate constipation is common. After about six days, often with great suddenness, jaundice appears. Fever settles by lysis. The patient feels much better. The liver may stay enlarged, though no longer tender.

**Catarrhal Jaundice.**—No clear-cut dual phase. May be a preliminary gastro-enteritis. No fever. Patient does not feel ill. Jaundice often the first abnormality noticed. Liver not spontaneously tender or painful. Vomiting very rare in the initial stage. Diarrhoea common.

I believe that this distinction is artificial and impossible to make. During an epidemic of infective hepatitis, although the first group of symptoms is the more common, not only does each group of symptoms appear in different patients but symptoms from both groups are often seen in the same patient. This is illustrated by the following brief case histories of eleven consecutive patients in an officers' mess in the Middle East. The number of officers in the mess was thirty-five. All the patients fell ill during a period of two months. It is not reasonably possible that they were suffering from different diseases.

(1) Loss of appetite. Felt slack. No vomiting. No fever. Jaundice on 7th day. Liver enlarged 3 fingerbreadths. Spleen not palpable.

(2) Loss of appetite. Felt slack. No fever. Jaundice on the 8th day. Liver enlarged 2 fbs. Spleen not palpable.

(3) Vomited one night. Continued to feel unwell, with nausea, for ten days. Then a "chill." General aches and pains and fever for two days. Loss of appetite, which persisted. Eight days later, jaundice. Liver and spleen not palpable.

(4) "Soaked to the skin." Fever for two days. Thought he had "flu." Poor appetite. Jaundice on 7th day. Liver enlarged 1 fb. Spleen just palpable.

(5) A "chill." Slight evening fever for four days. Loss of appetite after. Jaundice on 8th day.

(6) Lassitude. Complete loss of appetite. No fever. Vomited once on the 4th day. Jaundice on 9th day. Temp. 100°. Liver enlarged 2 fbs. Spleen not palpable.

(7) Dysentery. Six days later, loss of appetite. Five days after this, fever and enlargement of liver. Next day, jaundice.

(8) For four days thought to have malaria. Shivering. Slight fever. Unable to eat. Jaundice on 6th day. No enlargement or tenderness of liver. Spleen not felt.

(9) Malaise. Aching eyes. Slight fever for one day. Slight abdominal discomfort and loss of appetite persisted until 4th day, then jaundice. Liver enlarged 2 fbs. Spleen not felt.

(10) Felt ill. Shivery. Pain in back. Diarrhoea. Loss of appetite. Fever for a few days. Loss of appetite and feeling of illness persisted. Jaundice on 23rd day. Liver palpable 2 fbs. Spleen not felt.

(11) A "chill," with fever for two days. Following this, loss of appetite. Jaundice on 10th day. Liver just palpable. Spleen not felt.

Clearly no such clinical differentiation as suggested by Mancke and Siede could be made in these patients. The cause of infective hepatitis remains unknown. Recent work—epidemiological, clinical, and pathological—suggests a common disease process. Whether this will prove ultimately to be true remains to be seen, but any attempt at present to differentiate the disease by clinical data into different pathological processes is not only impossible but misleading.—I am, etc.,

E. R. CULLINAN, —  
Brigadier.

### Fracture of the Carpal Scaphoid

SIR,—In their paper (May 20, p. 685) Robertson and Wilkins rightly stress the importance of continuous immobilization in the treatment of recent fractures of the carpal scaphoid—a well-established principle in the treatment of all recent fractures—and their end-results in old-standing fractures of the carpal scaphoid show, as they state, the lamentable results that may follow a missed diagnosis and/or inadequate treatment. Of their 12 cases of "established non-union which had no other treatment than prolonged immobilization [many months] the men were discharged to light duty," and but for their special value to the Service would probably have been invalided as unfit. "Most of these cases showed some degree of osteoarthritis and disability of the wrist." Of the 12 cases which received operative treatment (3 bone graft, 2 excision of proximal fragment, 7 drilling) only 4 returned to duty. Are these the best results obtainable in old-standing cases? The authors will surely admit that these are very disappointing results.

In my experience better results can be got in old-standing cases by excision of the whole scaphoid, as the following cases show.

1. A joiner aged 24 fractured his scaphoid in 1915. In Nov., 1922, he was seen by me and complained of pain in the wrist after much hammering or planing. X-ray examination showed an ununited fracture of the scaphoid. On Dec. 6, 1922, I excised both fragments. He returned to work in six weeks and has had no trouble since.

2. A locomotive fireman aged 26 had an ununited fracture of the scaphoid of 7 or 8 years' duration. He had pain on jarring of the wrist when shovelling coal. Complete excision of the scaphoid was performed on Jan. 6, 1924. He returned to full work and has had no complaint since.

3. A tram conductor aged 32 fractured his right scaphoid on Aug. 28, 1927. He was treated in a "cock-up splint" for seven days. On Sept. 23, 1928, x-ray examination showed ununited fracture of the scaphoid. This man complained of pain in the wrist when punching tram tickets: this entailed constant use of the right thumb. On Sept. 26, 1928, the whole right scaphoid was removed. He returned to duty and has had no complaint since.

These three cases had been treated as sprain of the wrist and no x-ray examination had been done. All showed osteoarthritis and "cysts" in the fractured scaphoids. Two of these excised scaphoids were sent to the late D. M. Greig, and are now in the surgical museum of the Royal College of Surgeons, Edinburgh. The following characteristic remarks from Greig's letter acknowledging receipt of the specimens seem to me worth quoting: "Isn't the pain that these people suffer from not rather related to the ligaments meeting the strains at a disadvantage than to actual compression each time of the injured bone? I agree with you that excision is the proper treatment [for persistent non-union]. Rest may be good in the early stage, but not later, and I don't think at any time massage, electrical treatment, and such eclectic rot is of the least use. It may please the patient and gratify the radiotherapist, but it has no place in practical surgery."

In conclusion I suggest that Robertson and Wilkins (and other surgeons) might consider removal of both fragments in cases of old-standing non-union of the carpal scaphoid. In the three cases quoted there was complete relief from pain and no appreciable loss in strength or function of the wrist.—I am, etc.,

Dundee.

F. R. BROWN

### Aerial Transmission of Virus Infections

SIR.—I cannot see why there should be the least hesitation in accepting the aerial transmission of smallpox, and for that matter that of other infective diseases. Botanists tell us that they readily collect, on plates smeared with glycerin exposed on high buildings and on aeroplanes, abundant pollen grains and the spores of fungi. These objects have no flight mechanisms and must be infinitely heavier and bulkier than viruses; and, as those familiar with the effects of A.A. gunfire will be aware, what goes up must also come down. To my mind the wonder is that these viruses are not disseminated much further than clinical experience has so far demonstrated. The accurate bacteriological proof may not be accomplished for some time, though the recent demonstration of the viability and transmission in the form of dust within a building, of streptococci and other micro-organisms may be a start in the right direction; though, where the air currents caused by sweeping and dusting are to be compared with the winds of heaven outside buildings, the areas of dissemination involved will be proportionately greater.—I am, etc.,

Witley.

J. G. C. SPENCER.

### Nutritional Oedema in a Vegetarian

SIR.—In his comment (May 20, p. 699) upon my article Dr. D. G. McIntosh probably has in mind the condition of acute "beriberi heart," which is associated with gross oedema and often terminates in sudden death from cardiac failure. This type of beriberi may be associated with nutritional oedema, but in my case the ordinary signs of cardiac failure were absent: there was no radiological or clinical evidence of cardiac enlargement, no venous congestion, and the blood-pressure readings were normal. There was no cyanosis, and the dyspnoea and slight tachycardia were not more than could be explained by the pleural effusions. Furthermore, there was

evidence of polyneuritis, which in some degree is always present in the cardiac type of beriberi. It is unfortunate that more detailed investigations of the circulatory efficiency were not done, such as an electrocardiogram, circulation rate, and blood volume, but these are hardly necessary in order to diagnose congestive failure. It is highly improbable that any serious cardiac lesion was present, as the infusion of several pints of plasma produced no cardiac embarrassment. It would have been dangerous to overload a failing circulation in this way, and the possibility was considered before giving the plasma.

Dr. McIntosh's remarks are apt, however, in that similar cases may be found in occupied Europe, and they may be complicated by gross vitamin deficiencies in addition to the simple hypoproteinaemia. In such cases plasma transfusion as a rapid method of restoration of the blood protein should be avoided owing to the risk of overloading the circulation.—I am, etc.,

Scotford

J. MACDONALD HOLMES.

### Neurotic Battle Casualties

SIR.—Previous communications from this unit have reported the value of front-line sedation, sleep treatment, emotional abreaction, and modified insulin therapy in the rehabilitation of neurotic battle casualties. On the invasion of Europe more of these casualties are bound to occur. Sedation, insulin, and emotional abreaction deal with different aspects of the neurotic battle casualty. Hitherto the clinical picture has often required the consecutive use of all these methods to combat the tension, irritability, fatigue, exhaustion, loss of weight, and amnesias, to mention some of the features of such cases. During the past year I have found that a combined technique of continuous sleep and modified insulin was safe and often a therapeutic advantage. One could treat the patient in a comprehensive way promptly and with a minimum stay in hospital. In outline, insulin is given at 7 a.m., 10 up to 50 or 60 units according to individual tolerance as described by Sargent, while sleep is maintained with the short-acting barbiturate sodium amylal for 18 to 21 hours daily. During the insulin period sleep is kept relatively light, not more than gr. 6 of sodium amylal being given in this time. If need be, emotional abreaction of traumatic incidents is conducted in the afternoon, since the patient is then in the same drowsy state as occurs with intravenous barbiturates given specifically for this purpose. The essentials are that the staff be familiar with states of hypoglycaemia and sleep, that the food and fluid intake be kept at a high level, that 2 oz. glucose be given at teatime, and glucose kept at hand for oral or intravenous use if required—though in practice the need is rare. Treatment can be maintained for 14 days or longer, but where more than 4 to 5 days is necessary the sedative must be very slowly reduced to prevent a barbiturate withdrawal fit occurring, especially if insulin is continued after the full sleep course is terminated.

This technique is reported since it may prove useful for those who have to deal with acute battle casualties which have not responded to front-line sedation.—I am, etc.,

Sutton Emergency Hospital

D. E. SANDS.

### Mental Disturbance after Atebrin

SIR.—Dr. Gerrard, in his letter on the treatment of malaria (Feb. 5, p. 196), states that he encountered none of the alarming complications recorded by other writers on atebrin therapy in his investigations into this line of treatment in Hong Kong.

During the period 1939-41 I saw three cases of the so-called "atebrin psychosis" in Hong Kong. Two of these patients were young Chinese and the third was a middle-aged Dutchman who had needed periods of treatment in mental hospitals on several previous occasions. All three patients had been given 0.3 g. of atebrin intramuscularly for a fever presumed to be malaria, and all developed mental disturbance shortly after administration of the drug. The picture they presented was that of an acutely oncoming confusional state; temporal and spatial disorientation, hyperkinesia, and persistent insomnia being the outstanding features. The Dutchman was so violent that he had to be admitted to a mental hospital for 48 hours. Recovery was complete and rapid in all three cases, and seems

<sup>1</sup> *Lancet*, 1940, 7, 1; 1941, 1, 107; 2, 212; *British Medical Journal*, 1942, 2, 573; *War Medicine*, 1943, 4, 577.

to be assured once the normal sleep rhythm is restored. Similar disturbances after the use of atebirin have been reported by many other observers, particularly those working in the Far East.

In view of the fact that atebirin now bids fair to replace quinine in the treatment of malaria (for the time only, let us hope) it should be emphasized that the Eastern races and those patients with a past history of mental instability may develop acute mental disturbance if given atebirin by the intramuscular route.—I am, etc.,

Famagusta, Cyprus.

PAUL WILKINSON.

### X-ray Examination of Service Recruits

SIR,—Dr. Bernard Leggett (May 20, p. 700), in referring to the gastro-intestinal x-ray examinations of Service recruits for the Ministry of Labour, questions "the value of those one or two film examinations done without prior preparation at the instance of the Ministry of Labour with negative results." I would agree with him if this were generally the case, but, having x-rayed Service recruits for the Ministry for four years, it is only fair to say that my experience is totally different. Neither the Ministry nor their medical boards have ever suggested the number of films I should use in any examination, nor have I come across an instance of a medical board failing to give a recruit proper instructions for preparation before the examination. If an inadequate number of films is used, as Dr. Leggett states, and the medical boards are not informed as to the preparation required it is the fault of the individual radiologist and not of the Ministry of Labour.—I am, etc.,

London, W.1.

H. GRAHAM HODGSON.

### Operation for Umbilical Hernia in Children

SIR,—It was with keen interest that I found the question of injection treatment or operation for hernia taken up by Mr. Bennett-Jones in the *Journal* of Jan. 15 (p. 78) and applied to umbilical hernia in children. While most of his statements coincide with my own ideas and experience in this matter, I cannot feel tempted by the statistics given either to advocate or to use the injection treatment in such cases myself. For children who do not show a tendency to cure otherwise I rather adopt the attitude for umbilical hernia which Mr. Bennett-Jones himself pronounces with regard to inguinal hernia. Here it certainly holds good even more that "operative treatment is so safe, with recurrence and sepsis almost unknown." It is my own idea, as much as it is Mr. Bennett-Jones's, that admission to hospital should be avoided whenever possible, and to his arguments of shortage of beds and the danger of infection I should like to add the fact, stressed and proved by Herzfeld of Edinburgh, that children never get on so well in an institution the first time after admission.

The conclusion I drew from the facts mentioned was to look upon the operation on children without admission to hospital as the method of choice. That was recommended first by Stiles, I think, and observations of large numbers of such operations without complications and with perfectly satisfactory results have been published by Herzfeld of Edinburgh and MacLennan of Glasgow. According to Michailoff it seems that in Russia, too, operating on children as out-patients was nothing unusual. Encouraged by these reports and by Schwarzmann, my senior surgeon in Vienna (now in New York), I adopted this treatment many years ago, and in 1935 I published a report based on our experience covering 10 years. Space does not permit me to go into details of technique and results here, but I should like to emphasize that the procedure is so simple and the results are so perfect that I felt justified, even in my present practice without being attached to a hospital, to do an occasional umbilical hernia in the patient's home, using the dining table (Morrison shelter) as an operating table with the district nurse assisting. There was never the slightest trouble; the results were perfect, and mother and child as happy as can be. It seems to me, therefore, that the operation for umbilical hernia in children without admission to hospital might be taken up more widely than seems to be done at present.—I am, etc.,

Gillingham, Kent.

K. F. POLLACZEK.

### Poisoning the Endocrine Glands

SIR,—Recent work on the influences of thiouracil on the thyroid and of alloxan on the pancreatic islets, which, as set out in your leader (April 29, p. 595), represents the action of two substances poisoning selectively the endocrine glands, recalls earlier work on the action of thallium salts, which have undoubtedly a specific poisonous influence on the endocrine system. The use of thallium as a remedy against overgrowth of hair has been more or less abandoned owing to its toxicity, which has even led to the death of a number of patients. The experimental work (which seems to have been almost forgotten and which in the light of modern endocrinology is far from being complete) suggests, however, that thallium has either a specific pluriglandular action or a selective action on the anterior pituitary lobe, with subsequent cessation of function and degeneration mainly of the thyroid gland and of the gonads. The cytological changes of the Golgi apparatus and of the mitochondria in the thyroid cells after administration of thallium acetate are those found when there is diminished thyroid secretion. The cells themselves become flattened, the colloid stains acidophil, and the basal metabolic rate diminished (Ma, Wen-Chao, and Jui-Wu, *Proc. Soc. exp. Biol.*, N.Y., 1929, 27, 249). In rodents oestrus ceases completely, and returns one to eight weeks after discontinuation of thallium administration. No other known poison is able to produce such an action, nor do deep x rays have an equally prompt effect. The histological appearances of the ovaries of these animals are normal. That the inhibition of the oestrus is not due to general poisoning or to lack of ovarian reactivity but to a cessation of oestrogen production; probably through inhibition of gonadotrophic stimulation, is shown by the fact that oestrogen or gonadotrophins are able to produce an oestrogen response in animals under thallium treatment (Buschke, B. Zondeck, and Berman, *Klin. Wschr.*, 1927, 15, 683). In young rats retardation of growth, complete atrophy of the testicles, lack of sex desire, loss of hair, and cataract formation occur. Alopecia can be produced in youngsters by feeding thallium to the mother.

There seems to be no doubt that thallium is a specific endocrine poison which merits to be studied again from this point of view as to its functional and anatomical effects on the endocrine glands, especially on the pituitary, and that it is likely to be of therapeutic value once the mechanism of its action has been clarified and a suitable dosage established.—I am, etc.,

London, W.1.

H. UCKO.

### Service Medicine

SIR,—Recent correspondence on this subject has caused me to look up the extracts from the letter of an anonymous writer which appeared in the *Journal* of April 1. This unhappy correspondent appears to have missed all the joy and spirit of comradeship in what most of us regard as the most exciting period of our lives. Perhaps it would help him if he were to learn of the experience of one who was, until recently, a specialist in the R.A.M.C. and also a patient who owes much to the skill and care of the specialists in that corps.

When suffering from an obscure illness I was examined by five specialists in different branches of medicine. Each of these officers is a man of nation-wide reputation, and each one impressed me with his enthusiasm for his work and the sympathetic interest he took in my case. As a result of this investigation a correct diagnosis was made in a very short time, correct treatment was instituted, and, after a slow convalescence I was restored to health. Each of these gentlemen had to fill up a form and write a report about my case, but since these forms when taken together helped to save my life or at least save me from years of ill-health I may be pardoned for regarding them as valuable documents. In addition, these forms were of importance to me when it came to assessing my pension.

Like other correspondents I have been a consultant and a member of the staff of a teaching hospital for several years and, like them, I agree that the soldier gets better treatment than does the civilian, even in peacetime.

Except for about four months, when, by reason of ill-health, I was given a light job, I found that I had rather more work to do in the Army than I had in civilian life. I found more cases of special clinical interest to me in a military hospital than I have ever found in the same period in my civilian hospital. The team spirit is more in evidence in the Army than elsewhere, and it is a great help to a physician to be able to have the opinion of any other specialist without wondering whether it is fair to the patient to incur the additional expense. My civilian colleagues are invariably helpful and co-operative, but it is necessary to remember that the time they give to the hospital patient is time taken from their private and remunerative work.

There are some misfits in the Army Medical Service, and it is not always possible at the time to see the reasons for the wisdom of some of the orders we receive. Nevertheless I am convinced that the A.M.S. is directed efficiently, and the work of that department is characterized by wisdom, foresight, and, so far as individual officers are concerned, with great personal kindness. I am afraid the views of the anonymous correspondent are held by many, and the experience of the medical services in the present war is necessary, therefore, that every effort be made to remove facts before the medical profession. I am, etc.

Belfast.

T. A. ...  
Major

SIR.—With regard to the correspondence on this subject I am struck by the high Service ranks of those who write to support the Service point of view—brigade major, squadron leader. I have no doubt what the writer's point of view is, but I am sure that the letter giving rise to this correspondence is also quite good. In the Service so many of the patients are on the individual's ability to fit in, and many cannot get used to compulsory formation and the doctors keep no written records at all, and have no supervision—possibly because the fear it. We have men of the calibre of J. J. Conroy, under whose supervision I studied medicine some twenty-two years ago.

The main purpose of this letter, however, is to notice the point of view of Service patients. I have, from my own experience, and that of almost all my colleagues, whom I have spoken, that our patients in the Service are like the medical arrangements and do not trust the Service doctor. Again and again I have had personnel from the Services come to me on leave to unburden themselves and worry they feel they cannot take to the Service doctor. They know they will get excellent treatment if they leave the Service and go into hospital, but they cannot obtain it in comfort and support they look for from their doctors in the Service. This even applies to men who have been decorated for bravery on the field. They seem to think the unit doctor is too busy and has no personal interest in them.—I am, etc.

Bristol.

J. J. FULLER

### Expectation of Life in Urinary Tuberculosis

SIR.—To corroborate the memorandum by the late Mr. Henry Fenwick (May 6, p. 621) and the letter of Mr. Victor Barnard (May 20, p. 700) on occasional cases of longevities after infection I can record one case that was even more to the point. Early in 1907 a lady aged 53 had considerable distress of micturition. I found that she had tubercle bacilli in purulent urine and an enlarged right kidney. Mr. Hurry Fenwick made a cystoscopic examination and diagnosed the illness as one of tuberculous right kidney. He advised me to try tuberculin injections. This I did in small doses, and combined them with prolonged rest and a sensible fresh-air treatment. Later on Sir Almroth Wright saw her and agreed with the diagnosis and treatment. The urine gradually cleared of pus and tubercle bacilli; she was under treatment for three years. The right kidney remained large and micturition was at times frequent. This woman fully regained her good health and activity, there were no relapses; she died in January, 1940, aged 80, of senile aortic disease. Her infection had been almost certainly acquired from a "bronchitic" cook, whom I found to be expectorating

tubercle bacilli in abundance. These rare cases of great natural resistance have, of course, no bearing on the modern surgical treatment of tuberculosis of the kidney.—I am, etc.,

Hastings

HARRY GABB.

### Ophthalmologist and Optician

SIR.—In a previous letter (May 6, p. 635) on the question of ophthalmic surgeon and optician I expressed a doubt as to whether the sight-testing opticians would co-operate as medical auxiliaries in a national eye scheme. The letter which you have published from Mr. W. B. Barker (May 20, p. 702) shows this to be the case, but it also proves a far more important point. By his statement that for an optician to undergo medical training would be "as wasteful and unnecessary a basis for optical practice as it would be for dental practice" he tells us that he has no conception at all of the organ with which he is dealing. An aching tooth or dental sepsis is essentially a local condition, but an aching eye or a tired eye may be a danger signal of general disease, and these signs may be important.

The eyes are the windows of the body, and the very earliest signs and symptoms of diseases of the nervous system, the circulatory system, etc., may present themselves in the eye. If the patient with papilloedema or diplopia is treated with spectacles or orthoptics the presence of an intracranial lesion may be unsuspected until it is too late. The neuro-ophthalmologist, aided by radiology and electro-encephalography, can detect and remove an intracranial neoplasm if he gets it in time, and it must be remembered that intracranial tumours are not rare but are only second in incidence to the uterine neoplasms. A neoplasm may develop in the eye itself at an early age and failure to recognize it may cost the patient his life. We have all seen, far too often, the patients with primary glaucomas who are treated with spectacles until but one small portion of one visual field remains. It will be seen, therefore, that the eyes of which we have only two, and the teeth, of which we have 32, can in no way be compared, and yet no dental surgeon would refer to his course in anatomy and general pathology as a waste of time. Finally, dentures prove a very efficient substitute for our teeth, but an artificial eye is useless as an organ of sight.—I am, etc.

LESLIE HARTLEY.

SIR.—Possessing no knowledge of optics practitioners cannot decide whether sight-testing is the concern of medicine or can be undertaken by opticians. In forming a judgment it is essential to recognize that this testing is merely a measurement of the eye, and, except that the technique is more involved, is akin to other bodily measurements. Where it differs is that the symptoms of an eye defect may simulate disease, and an eye must be pronounced healthy before glasses are given. This contention the optician has accepted for at least two decades, and he maintains that his training enables him to fulfil his obligation in that it comprises the same methods of investigation that oculists universally use.

The means of determining health, applicable to every organ, constitute a study of symptoms, the investigation of functions, and, in the eye, an external and internal inspection. In investigating function the optician not only considers direct vision, but the fields for colour and white are taken when these procedures are indicated. As the luminous ophthalmoscope makes the interior of the eye almost as visible as is a face, the overlooking of a lesion is inexcusable.

But for a service to be efficient it must be more than competent; it must be readily available and at a cost that is not disproportionate to the service that is rendered. To recruit "sight-testers" solely from medical men would so curtail facilities that, rather than suffer the inconvenience and expense, patients would gradually resort to selecting their glasses themselves at a general store as some do to-day. Further, a medical training is too valuable to be wasted on measuring, and many, like myself, are convinced that not only is it in the interest of medicine to delegate sight-testing but it is also to the benefit of the community that the hand which fits the frame should be responsible for prescribing the lens.—I am, etc.,

London, W.1

JAMES FORREST.

### Work of Women Doctors: A Survey

SIR,—The Medical Women's Federation considers it important that accurate and up-to-date information concerning the work of medical women should be obtained—e.g., the number who give up medical work temporarily or permanently after qualification, etc. The Federation is therefore undertaking a survey of the work of women doctors and a questionnaire is being sent to every woman by a representative from each medical school in Great Britain and Northern Ireland which admits women students now or has done so in the past.

May I, through your columns, urge all medical women, whether engaged in medical work or not, to complete and return the questionnaire without delay? It is possible that some may not receive the questionnaire owing to change of name or address. Will they please apply to the office of the Federation (73, Bourne Way, Hayes, Bromley, Kent) asking to be put in touch with their medical school representative in order that a questionnaire can be sent to them?

In the cases of graduates from the London (R.F.H.) School of Medicine for Women, the inquiry is being conducted by Prof. Lucas Keene. As regards all other medical schools the dean's office is not concerned in this matter and has no information to give about it.

This request does not apply to women who qualified from University College Hospital Medical School (University of London) or from Birmingham Medical School, as the information from graduates in these schools has already been obtained. —I am, etc.,

JANET K. AITKEN,  
President, Medical Women's Federation.

## Obituary

By the death in his 91st year of GEORGE HOLLIES of Wellington, Salop, the profession in Shropshire has lost its oldest and the B.M.A. one of its oldest members. Dr. Hollies began his professional life in a way not uncommon in his young days but almost unknown at the present time by becoming a pupil to a well-known practitioner in the town of Halesowen, Worcestershire. After a period of pupillage, when he was contemplating entry to a medical school, his father died and left him practically stranded. But this did not deter him; he proceeded to earn his living by assistantships, not very well paid in those days, and saved money for his fees. His last assistantship was in Cambridge, and during this period he entered as an undergraduate, and eventually took the B.A. degree. He completed his curriculum at the London Hospital and in Birmingham, and qualified as L.R.C.P., L.R.C.S.Ed., and subsequently graduated M.B., B.Ch. of Trinity College, Dublin. Offered a partnership by the late Dr. Steedman of Wellington, Salop, he settled down in that town, and for many years was the leading practitioner there, gaining the respect of all and the affection of large numbers. He was a member of the B.M.A. for many years, a member of the Shropshire and Mid-Wales Branch Council, and president of the Branch. He concerned himself with all the public activities of his town and county. He was a J.P., the first chairman of the urban district council, an alderman of the county, and chairman of its public health committee. For 40 years he was a volunteer or territorial medical officer, attaining the rank of lieutenant-col. R.A.M.C.(T.) attached to the Cheshire Brigade R.F.A. In the last war he was the oldest medical officer in the Western Command, and served as S.M.O. Divisional Mounted Troops, Welsh Division, until he was invalided out in 1916. His wife died about 20 years ago, and he leaves no direct survivor, but several of his nephews are in the medical profession.

Dr. ARTHUR HENRY HOWARD HOWARD, who died at Millbrook, Plymouth, on April 20, aged 63, had practised there for a considerable time. He took the M.R.C.S., L.R.C.P. in 1909 after professional training at Charing Cross Hospital, and served there as house-surgeon. He was then medical officer for three years to the Children's Hospital at Much Hadham, Herts. During the last war he held a commission in the R.A.M.C. and was attached to No. 32 British General Hospital, Amara, after which he became officer in command of the 323rd Field Ambulance, and returned to this country to take charge of the ear department of the Clipstone Military Hospital, Notts. His first association with Sheffield, where he practised in partner-

ship for some years, had been as casualty officer to the Royal Infirmary and anaesthetist to the Royal Hospital. At Plymouth he was medical officer and public vaccinator for St. Germans, and surgeon to the police and the post office.

The passing of Dr. ARTHUR STANLEY PARKINSON on May 2 has caused widespread regret among his patients, colleagues, and friends. Born at Bradford in 1877, he came of a family who had practised medicine for several generations. He was educated at the Leeds Medical School and subsequently pursued postgraduate studies in Paris, obtaining the M.B., Ch.B.Vict. in 1900, the M.D.Leds in 1905, and the D.P.H. in 1906. The appointments he had held were: house-surgeon to the General Infirmary at Leeds; resident physician to the Worcester Consumptive Sanatorium, Knightwick; and resident medical officer to the Consumptive Sanatorium, Gateforth. His publications included several articles on tuberculosis, and his membership of the British Medical Association extended over many years. From 1908 to 1931, except for service in the R.A.M.C. for which he volunteered during the last war, he resided in Wavertree, Liverpool, where he established a large practice. After several years in Hastings, he eventually returned to the North-West and lived at West Kirby. Though he had decided to retire, with the outbreak of war and consequent shortage of medical practitioners he energetically recommenced practice and also undertook valuable work in the examination of recruits. Dr. Parkinson represented the finest type of general practitioner, possessing marked ability and always keeping abreast of modern advances. Ever cheerful, it is impossible to speak too highly of his kindness and devotion to his patients. His passing is indeed a great loss.—H. H. S.

Dr. WALDEMAR BARTHOLOM SOMMERS died on May 9, at Redhill, Surrey, after a long and patiently borne illness. He was born in New Zealand, coming to Edinburgh to study medicine in 1902, where he graduated M.B., Ch.B. with 2nd class honours in 1908. After a year as house-physician to Prof. Greenfield he was appointed medical officer to the Burmah Oil Company, and he carried on his work at Syriam, the oil refinery. While on leave in 1914 he took the F.R.C.S.Ed. At the end of his contract in 1925 he retired to Redhill. J. C. L. writes: "I was a fellow student of Bart Sommers and then joined him in Burma. Since coming back I have kept in the closest touch with him and have seen the wonderful philosophy and fortitude with which he bore his very distressing illness for nearly five years. He started medicine rather later than the majority of students, and to those of us who were privileged to become his friends this fortitude would have been expected of him. He was always quiet and rather reserved and did not make friends easily, but to those with whom he did he was always helpful in advice, both professional and social, to those younger than himself. He was a very sound physician and very modest with it all, and he earned much gratitude and praise both from the officials and from the natives with whom he came in contact during his all-too-short professional life. He was never particularly robust, so did not carry on any activities after his retirement from Burma. He leaves a widow, to whom all who knew him will extend the deepest sympathy.

Dr. CLAUDE GOULDESBOURGH, who died at Calstock, Cornwall, on May 12, aged 63, had practised for many years as a radiologist in London. He was educated at Rugby and Christ Church, Oxford, and studied medicine at St. Thomas's Hospital, taking the M.A., B.M., B.Ch. degrees in 1909, and was then casualty officer at St. Thomas's and house-physician at Addenbrooke's Hospital, Cambridge. Soon afterwards he began to specialize in radiology, and by 1914 had gained considerable experience as assistant superintendent of the x-ray department at St. Thomas's and M.O. in charge of the same department at the Royal Chest Hospital. In August, 1914, he went to France with the R.A.M.C.(T.), and became senior consulting radiologist to the B.E.F. In 1915 he returned to this country as consulting radiologist to the Empire Hospital for Officers, and wrote on military radiography in English hospitals in France during the first nine months of the war for the *Journal of the R.A.M.C.* Other hospitals with which Dr. Goulesbrough served as radiologist were the Royal Northern Hospital, the Royal Westminster Ophthalmic Hospital, the Bethlem Royal Hospital, and St. Mark's Hospital, City Road.

Dr. HELEN STANLEY FAIRLEY was born in the Pas-de-Calais in 1875. She was a daughter of Major Richard Ireland Stanley and cousin of Sir William De Courcy Wheeler, a former president of the Royal College of Surgeons of Ireland. She spent a great part of her childhood with the Wheeler family and began her medical career at the Edinburgh College for Women in 1892, being one of the pioneer women in the profession. During this period she showed exceptional ability and qualified L.R.C.P.,



The second reading of the Rural Water Supplies and Sewerage Bill was moved on May 18 by Mr. WILLIAMS. He said the object of the Bill was to stimulate the making of plans in readiness for a sustained attack on the problem of the 30% of the inhabitants of rural England and Wales who were beyond the reach of adequate, wholesome supplies of water in pipes. The Bill proposed assistance to the extension of sewerage. It would guarantee that the Government would help rural authorities which, in planning extension of piped water and sewerage, would be faced with costs beyond what ratepayers and com-



sumers could reasonably bear. For England and Wales £15,000,000 and for Scotland £6,000,000 were proposed as grants-in-aid. A power to the Minister to compel amalgamation and bulk supply of water from one authority to another would be included in major legislation to be introduced later. The persons affected by this Bill numbered 2,000,000 out of 40,000,000, and the call on water reserves was not relatively heavy.

Mr. TOM JOHNSTON said the purpose was to provide in Scotland wholesome water in pipes to every rural locality where there were houses or schools and to take the pipes to where those houses or schools could be connected at reasonable cost.

The Bill was read a second time.

### Milk Supplies: New Central Control

Mr. ROBERT HUDSON moved on May 19 the second reading of the Milk and Dairies Bill. He said that consumption of liquid milk had gone up from 866,000,000 gallons yearly before the war to 1,185,000,000 gallons yearly. Supplies were insufficient and the Ministry of Food assumed that existing priority consumption by school-children and nursing and expectant mothers would continue after the war as part of the permanent social services. The Ministry of Food thought an additional 350,000,000 gallons of fresh milk per annum would be required before rationing could be abolished. Mr. Hudson hoped this would be accomplished. The aim must be not only milk in greater quantities but milk in which the public and the medical profession would have complete faith. This Bill was a necessary step to achieve that aim. Every dairy herd would, in future, be inspected by a qualified "vet" at least once a year. There were not enough "vets," and the provision for the training of more was under consideration. Steps for the control of disease had been extended. Mastitis, abortion, sterility, and Johne's disease were being dealt with by a scheme which had help from his Department. There had been an increase in the number of calves vaccinated against contagious abortion. He hoped soon to introduce a voluntary scheme which would enable the "vet" to carry out vaccination of the calves while he was at the farm. The Attested Herds Scheme against tuberculosis was making rapid progress before the war, but had to be suspended. He proposed shortly to reopen admission to that scheme. This would apply to both farmers selling their milk and farmers rearing stock. He hoped thus to build up whole areas free from tuberculosis from which dairy herds could be replenished with cattle free from the disease. In addition, the Ministry was pressing on with a national milk testing and advisory service. Of supplies to large depots, over 92% was now regularly tested; of producer-wholesalers' milk over 88%; and of producer-retailers 22%. The result was that the keeping quality of the nation's milk had been improved in the last two years. The Bill proposed to transfer to the Ministry functions which the local authorities had not always carried out. These were the inspection of premises, of equipment, and of methods of milk production. The powers had been entrusted to local authorities in 1926, when there was no State veterinary service and when milk supplies were drawn from the surrounding country; now supplies came to great cities for the most part from distant regions. Local authorities in the great consuming areas had no control over the conditions of their milk supplies. To carry out the provisions of the Bill he would have to increase his veterinary staff and also to recruit non-veterinary staff, men and women, with the qualifications of sanitary inspectors, milk inspectors, and so forth. He and the Ministry of Health would be jointly responsible for making regulations. The local authority would continue to be responsible for keeping a check on the cleanliness and purity of milk sold in its area.

Mr. TURTON moved to defer legislation until a Royal Commission had been appointed and had reported. Mr. CHARLES WHITE complained that tuberculin-tested milk was ordered to be mixed with milk of an inferior quality. Sir WILLIAM WAYLAND said the sanitary inspector was the proper man to examine the condition of a cowhouse. The veterinary inspector would not do that. It was not his trade. MRS. TATE contended that inspection of churns would still be the duty of the local authority. Mr. HUDSON remarked that Mr. Willink and he would make regulations in order that the churns would be properly inspected, which they were not at present.

### NO MENTION OF SAFEGUARDS

Sir GEORGE ELLISTON said conveyance of disease through milk went on year by year, and the almost unanimous view of the medical profession had long been that the only real protection for many years to come must be by heat treatment of milk supplies. That view had been adopted in Canada and the United States, yet the House of Commons discussed this Bill without mention of the available safeguards against diseases

caused by milk. It would be 40 or 50 years before the dairy herds of this country could be regarded as safe. It was regrettable that the Minister of Health should abdicate his powers over milk supplies. Power to make regulations should be retained by the Ministry of Health so long as any designated milk was allowed to be sold unpasteurized. Accredited milk had often been found to contain a higher percentage of tuberculous infection than raw unaccredited milk. That was the experience of the L.C.C. over five or six years.

Miss HORSBROUGH said all Members were dissatisfied with the present standard of the farms and with the lack of cleanliness of milk off the farms. The Government asked for a joint effort from the local authorities and the Ministry. Local authorities would be responsible for the milk in transit and in the shops. Enough stress had not been put on the time after the milk left the farm.

The Bill was read a second time by 116 to 13.

**Penicillin Production.**—Mr. CHARLES PEAT said on May 18 that small quantities of penicillin in its crude filtrate form could be produced in any bacteriological laboratory. This penicillin could be used for treatment in certain classes of case under special medical supervision. Such laboratories would not be able to make any significant amounts of pure penicillin for general distribution.

### Notes in Brief

The Minister of Health proposes to consult the Mental Hospitals Association before introducing legislation affecting the mental health services of the country.

## Medical News

A meeting of the St. Marylebone Division of the B.M.A., to which all practitioners in the area have been invited, will be held at Marson House, 26, Portland Place, on Monday, June 5, at 5 p.m., to consider the Report of the Council on the White Paper.

A Chadwick lecture on "Vegetation and Human Well-being" will be given on Thursday, June 15, at 4 p.m., at the Chelsea Physic Garden, Swan Walk, S.W.3, by Dr. B. Barnes, head of the department of biology, Chelsea Polytechnic. Particulars may be had from the secretary of the Chadwick Trust, 204, Abbey House, Westminster, S.W.1.

The meeting of the Pathological Society of Great Britain and Ireland which was to be held on July 7 and 8 has been cancelled owing to restrictions on travel.

The annual general meeting of the Society for Relief of Widows and Orphans of Medical Men was held on May 10 with the President, Dr. R. A. Young, in the chair. The report for 1943 was presented and adopted. During the past year 56 widows had been granted relief, receiving a total sum of £4,550. The total membership of the Society was 286. The invested capital now amounts to £141,000. Membership is open to any registered medical man who, at the time of his election, is resident within a twenty-mile radius of Charing Cross; after his election he is at liberty to reside anywhere outside that radius. Relief is granted only to the necessitous widows or orphans of deceased members. At the present time widows over 65 years of age receive £75 per annum, those under 65 receive £60. Last year a Christmas present of £10 was made to each widow. The grants to orphans cease on their attaining the age of 16; there is, however, a special fund from which grants may be made to enable them to study for some professional or business career. Full particulars and application forms for membership may be obtained from the secretary at the offices of the Society, 11, Chandos Street, Cavendish Square, W.1. Members are asked to notify any recent change of address to the secretary.

The thirteenth annual report of the Family Planning Association is a brief document giving an outline of another year of work under war conditions. A week-end instructional school for doctors, arranged by the Sub-fertility Committee, was held last October at North Kensington Women's Welfare Centre and was attended by 40 doctors from all parts of the country. There are now 62 voluntary clinics in Great Britain, of which 55 are run by branches of the F.P.A. A list of these clinics can be had on application to the secretary, at the offices, 69, Eccleston Square, London, S.W.1.

Mr. George H. Law, proprietor of the *Scotsman*, has bequeathed £10,000 to Edinburgh University to be devoted within a year to found a chair of lectureship in orthopaedics. He made other bequests, including £3,000 to the Church of Scotland Deaconess Hospital, £2,000 to Edinburgh Royal Infirmary, and £2,000 to the Royal Edinburgh Hospital for Sick Children.

The Eugenics Society, of which Lord Horder is president and Dr. C. P. Blacker hon. secretary, has issued in pamphlet form a revised version of the aims and objects of the Society. Copies may be had from 69, Eccleston Square, London, S.W.1.

The courses in industrial medicine arranged for July by the Faculty of Medicine of Sheffield University have been postponed owing to the national emergency.

Sir Stanley Woodward, C.M.G., C.B.E., M.D., F.R.C.P., was appointed President of the Royal Institute of Public Health and Hygiene at the annual general meeting held on May 25.

Prof. Alfred Rosset, director of the department of radiology at the Lausanne cantonal hospital, has been elected rector of Lausanne University for the period 1944-6.

The College of Speech Therapists has issued a short printed memorandum on the necessity for making provision for speech therapy among school children. Speech therapy is a medical auxiliary service, and the names of qualified persons appear on the *National Register of Medical Auxiliaries*. The memorandum refers briefly to the effect, the nature, and the incidence of speech disabilities and the reasons for the present neglect of children suffering from them. Out of 315 education authorities in England and Wales, only 104 have appointed speech therapists, while in Scotland only 6 out of 35 have made such appointments. All local authorities responsible for the welfare of children and young people are urged to include in their plans for the future, arrangements for the proper care of those whose speech is defective. The College is prepared to give advice and assistance in this matter to those applying to the secretary, 86, Harley Street, London, W.1.

The following medical prisoners of war have just been repatriated: Lt.-Col. W. E. O. Buchanan, Capt. S. G. Cowper, Capt. W. Mackay Davidson, Capt. C. Donald, Capt. W. Dornan, Capt. J. P. N. Fox, Capt. A. G. Hewer, Col. D. P. Levack, Major F. J. O'Meara, Major A. S. Till.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In England and Wales infectious diseases were generally more prevalent, the total for scarlet fever being 145 higher than last week, that for whooping-cough 116, and that for measles 97.

The incidence of scarlet fever rose most markedly in Lancashire and Yorks West Riding, where the total notifications were 52 and 40 respectively above those for last week. Yorks West Riding had 35, and Warwickshire 34, more cases of whooping-cough than they reported last week, but Lancashire had 35 fewer notifications. Kent and Glamorganshire, with the number of notifications respectively 78 and 45 higher, were mainly responsible for the rise in measles incidence. The notifications of diphtheria were 36 above the previous week's total, London's total going up by 20.

Last week's high total for dysentery notifications was exceeded by 21. The chief centres of infection were Lancashire 61 (Blackburn C.B. 38), Cumberland 29 (Penrith U.D. 26), London 21, Derbyshire 15, Essex 14, Warwickshire 12, Shropshire 11, Sussex 11, Middlesex 10, Hertfordshire 10.

In Scotland notifications of measles were 106 higher than last week, those of dysentery 37 fewer. In Glasgow the incidence of measles rose from 301 to 394. Edinburgh reported 21 cases of dysentery, and Glasgow 15.

In Eire the total notifications of measles dropped by 105. The total for paratyphoid includes 56 cases from Dublin C.B. which occurred in institutions from the week ending April 29 and which have only now been reported.

### Quarterly Returns for Scotland

A preliminary statement for the first quarter of 1944 has been issued by the Registrar-General for Scotland. The birth rate was 18.6 per 1,000 and was 0.3 below the rate for the first quarter of 1943 but 0.6 above the average of the previous five March quarters. The infant mortality was 76 per 1,000 and 19 below the five-year average for this quarter, with the exception of 1943, when the rate was 75, this was the lowest infant mortality ever recorded in a first quarter. The maternal mortality was 2.8 per 1,000 live births, being 2.1 below the five-year average and the lowest rate ever recorded for any quarter. The general death rate was 14.4 per 1,000, the same as in the corresponding quarter of 1943 but 2.6 below the average. The death rate from tuberculosis was 88 per 100,000 from all forms, and 65 from the respiratory form. The rate for all forms was the same as the five-year average, but the rate for respiratory tuberculosis was 4 below the average.

### Week Ending May 20

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,733, whooping-cough 2,619, diphtheria 598, measles 2,255, acute pneumonia 806, dysentery 276, paratyphoid 3, typhoid 5.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 13.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) London (administrative county), (c) Scotland, (d) Eire, (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London), (b) London (administrative county), (c) The 16 principal towns in Scotland, (d) The 13 principal towns in Eire, (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	70	5	26	4	2	62	6	29	4	1
Deaths .. ..	—	1	—	—	—	—	—	—	—	—
Diphtheria .. ..	584	48	161	70	33	602	31	149	78	19
Deaths .. ..	7	—	—	—	1	12	1	3	1	—
Dysentery .. ..	280	21	54	5	—	98	22	41	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	4	—	—	—	—	4	—	1	1	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	48	4	4	—	—	39	10	3
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	53	7	14	13	4	41	9	5	30	7
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Measles .. ..	2,132	210	560	161	16	8,032	518	569	6	50
Deaths .. ..	4	2	—	—	—	11	1	2	—	—
Ophthalmia neonatorum .. ..	75	5	14	—	—	48	2	27	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	10	1	20 (B)	62 (B)	—	4	—	2	—	—
Deaths .. ..	—	—	—	—	—	1	—	—	—	—
Pneumonia, influenza* .. ..	704	52	1	12	2	712	29	4	5	3
Deaths (from influenza) .. ..	14	—	1	—	1	22	3	6	—	—
Pneumonia, primary .. ..	—	—	100	15	9	—	—	191	32	7
Deaths .. ..	35	—	—	—	—	24	—	13	—	—
Poli-encephalitis, acute .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polymyelitis, acute .. ..	2	—	3	—	—	8	2	1	5	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	1	18	—	—	—	2	11	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	150	16	18	2	1	169	10	14	—	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,791	133	190	20	64	1,748	157	262	38	34
Deaths .. ..	2	1	1	—	—	1	—	—	—	—
Smallpox .. ..	1	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	8	—	1	5	4	4	1	2	10	2
Deaths .. ..	1	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,548	262	179	42	16	2,106	126	268	20	37
Deaths .. ..	14	2	1	—	—	11	2	1	2	—
Deaths (0-1 year) .. ..	354	44	66	—	21	341	43	53	34	22
Infant mortality rate (per 1,000 live births) .. ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding stillbirths) .. ..	4,290	615	553	134	4,502	698	628	222	132	—
Annual death rate (per 1,000 persons living) .. ..	—	—	12.7	—	—	—	14.2	14.6	—	—
Live births .. ..	7,886	883	1,028	303	6,638	774	952	450	344	—
Annual rate per 1,000 persons living .. ..	—	—	20.9	—	—	—	19.4	29.6	—	—
Stillbirths .. ..	208	20	35	—	—	239	21	37	—	—
Rate per 1,000 total births (including stillborn) .. ..	—	—	33	—	—	—	—	—	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Athlory Westcent, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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### ANY QUESTIONS?

#### Ergotamine Tartrate for Subinvolution

**Q.**—A woman aged 28 has had a slight blood-stained uterine discharge intermittently since the birth of her first child two years ago. There is also a slight degree of prolapse with low backache. I am treating her as a case of subinvolution with ergotamine tartrate, 1 mg. twice daily, in conjunction with glycerin tampons. Is the dose of the drug adequate? How long can it be given continuously without the risk of producing toxic symptoms? How long should the interval be between courses? I would be grateful for further information and advice on treatment. There is no menorrhagia. Periods last about 5 days—no gross irregularity.

**A.**—The characteristic feature of chronic ergot poisoning is gangrene of the extremities. This is caused by a group of alkaloids of which ergotamine is a representative. Cases are recorded in which gangrene of the legs has occurred during the puerperium in patients who have been given ergotamine, but usually these women have also suffered from sepsis, and it is therefore difficult to judge the part played by the drug. Apart from childbirth, ergotamine is often freely used by sufferers from migraine, apparently without ill effects. In view of the known properties of the drug, it is, however, prudent to limit its continued use to doses of 1 mg. twice daily by mouth for periods of not more than one week at a time.

There is no convincing evidence that the continued administration of ergotamine, or any other ergot preparation, influences uterine involution. In any case, it can scarcely be supposed that such therapy would have effect two years after childbirth. Judging from the symptoms as stated, it is probable that this patient's trouble is caused by gynaecological disorder of another variety—possibly of the cervix uteri.

#### Potassium Tellurite Swabs for Diphtheria Diagnosis

**Q.**—Are potassium tellurite swabs efficacious in deciding whether a tonsillar patch is diphtheritic or not?

**A.**—Such swabs are not reliable. Many organisms other than those of true diphtheria—e.g., avirulent diphtheria, some diphtheroids, and other bacteria—reduce tellurite, producing a blackening, and so give false positives. "False negatives" are also met with in practice. The test can in no way take the place of the clinical and bacteriological methods in use. Reliance on the tellurite test would deprive one case in six of necessary immediate serum treatment, and would lead to unnecessary administration of serum to nearly 50% of non-diphtheritic cases. (See *B.M.J.*, 1939, 1, 1273, 1291; 1939, 2, 140; and *J. Amer. med. Ass.*, 1941, 117, 1255.)

#### Prevalence of Bovine Tuberculosis

**Q.**—What percentage of tuberculosis in this country is caused by bovine bacillus? What percentage of the population in the U.K. infected with bovine tuberculosis (a) in the population as a whole (b) school age and under? What are the corresponding figures for Canada and U.S.A., where it is understood the compulsory pasteurization of milk has reduced the incidence by 75%?

**A.**—It is impossible clinically to distinguish between tuberculosis due to human and tuberculosis due to the bovine type of bacillus. The typing of tuberculosis requires skill and time and is not performed as a routine; consequently official figures for the whole country are not available. A recent estimate from the bacteriological evidence of different workers shows that the bovine type is responsible for about 2% of all cases of pulmonary tuberculosis and for about 30% of all cases of non-pulmonary tuberculosis. The proportion varies with the variety of tuberculosis. The bovine form accounts for over three-quarters of the deaths from tuberculosis of the intestines and peritoneum. These values are based on necropsies, etc., and no useful estimation can be made of the amount of bovine infection either in the whole population or at school age and under.

There are considerable geographical differences. Pulmonary tuberculosis of bovine origin is very low in the south of England, becomes commoner towards the north, and in the north-east of Scotland accounts for 10% of all cases of pulmonary tuberculosis. The extent of bovine infection in Canada and the U.S.A. is unknown. Investigations in various cities have shown that with efficient pasteurization the bovine form of tuberculosis tends to disappear. An example of these inquiries is to be found in Toronto, where compulsory notification has been in force since 1915; an investigation did not discover a single case of bovine infection, although 4% of the churn milk and 26% of the bulked milk entering the city contained tubercle bacilli.

#### Dry, Crusty Nares

**Q.**—I have seen a number of patients recently in whom, usually after a cold, a dry, crusty condition of the anterior nares persists. What is the best way of dealing with this very minor but troublesome condition?

**A.**—The soreness and dryness following a cold are best treated by rubbing in a little lanolin twice daily; or, if lanoline is unobtainable, by applying

Ung. hyd. ammon. dil. 3j  
Paraff. moll. ad 3j.

#### Post-operative Morphine

**Q.**—Where rapidity of action, hausea, or vomiting are not important factors, is hypodermic morphine administration generally justified? Where post-operatively morphine is given over 24 to 48 hours, is sublingual dosage four-hourly satisfactory? If given properly, was sublingual dosage satisfactory in the last war?

**A.**—Provided the dosage is suitably increased, the effect of morphine given sublingually can be regarded as satisfactory. The questioner's provisos are, however, very frequently present, and especially is rapidity of action often very advisable. For general post-operative sedation over a period morphine is adequate when administered by mouth, and it was certainly thus used on occasions in the last war. However, the precision of control of dosage and certainly of action of hypodermic injection render this method advisable in ordinary practice.

#### Treatment of Migraine

**Q.**—A married woman of 54 has suffered from migraine since the age of 14. She is getting some relief from drugs. She suffered from hay-fever some years ago, but this has cleared up. She states that her periods ceased 1½ years ago. She is not neurotic and her appetite is fairly good between attacks. She has lost weight during the past 2 years (1-2 stone). I would be glad of any suggestions as to treatment. Attacks (headache, nausea, weakness) are, if anything, increasing in severity and frequency.

**A.**—There are three lines which might be just (but only just) worth following. (1) The patient has an allergic history. It is possible that some cases of migraine are allergic. The patient should therefore have skin tests performed for sensitivity to foreign proteins, and she should be desensitized against any found to be positive. (2) Reports have appeared from time to time of good effects from the injection of the gonadotrophin of pregnancy urine. The evidence that this treatment is useful is not good, but in a case like this, no harm could come from giving it a trial. The suggested dose is 500 rat units twice a week, with a gradual reduction if and when success is achieved. (3) There is rather better evidence that a dehydrating treatment may be useful in some cases, especially when the patient complains of oliguria. The diet should be rich in protein and poor in fat and carbohydrate (a difficult thing to attain in wartime), free from salt, and low in fluids. Urea should be given in a dosage of 25 to 50 g. a day, and other diuretics may be employed. If the above three suggestions fail, it would be worth while seeing whether ergotamine tartrate works sublingually in this patient. If it does, injections can be discarded. This often means that the patient will use the treatment more frequently and earlier and therefore more effectively.

#### Treatment of Keloid Scar

**Q.**—A boy vaccinated about two years ago has developed a keloid, which gave him some pain at first. But he has not complained for the last six months. Is there any risk in not having it treated?

**A.**—Keloid (the purists spell it cheloid from the Greek *chēlē* = claw) is a fibrous overgrowth in the subcutaneous tissue occurring at the site of an intentional or accidental injury to the skin. It is more likely to develop if healing has been accompanied by granulation tissue, as happens in burns or other infected lesions, and there is probably an individual predisposition to it. Histologically the tissue consists mostly of collagen fibrils with scanty fibroblasts, and there is no evidence that this hyperplastic reaction is a precursor of tumour formation. Thus it may be safely left alone. If, however, it is unsightly, or painful due to involvement of superficial nerves, or sufficiently raised to be irritated by clothing, treatment with deep x rays or mild gamma irradiation may be recommended as a reliable method of cure.

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followed by a month of practical training in a marine hospital. More than 1,200 have graduated from the school since the end of 1942, and U.S.A. officials estimate that one out of every four merchant ships now has a medical representative aboard. Dovetailing the work of a purser and pharmacist's mate was thought to be the most economical way of providing medical care for the American Merchant Marine. Duties as a purser are heavy when a ship is in port where spare medical facilities are available, but while at sea he has ample time to devote to medical care of men and ship sanitation. Each class entering the hospital school is made up of 40 pursers and ten apprentice seamen. Experienced pursers are not required to attend the purser's school, taking only the medical part of the combined programme. In the Hospital Corps School seamen receive instruction in elementary anatomy and physiology, nursing, and preventive medicine including the giving of inoculations, ship hygiene and sanitation, clinical laboratory work, pharmacy, and advanced first aid. This course is followed by a month in a marine or other approved hospital.

#### Why Tie the Cord?

Dr. E. W. PRICE writes from the Baptist Mission Hospital, Pimu, Belgian Congo: It is more or less assumed in one's medical upbringing in England that failure to tie a newborn baby's cord after section entails considerable risk of fatal or serious haemorrhage. It is therefore surprising to find that among at least one tribe in Africa—one, that is, with which I am familiar—there has never been any attempt to tie the cord in native midwifery. Their use of ligatures, in other medical conditions suggests that if haemorrhage had occurred even a few times the medical tradition would have grown up to ligate the cord, as a preventive. In addition to this observation is the corresponding fact that in seven years' medical experience no case of umbilical haemorrhage has come to my notice. And only one case of umbilical infection. This latter observation is of outstanding significance. The knife used for cutting the cord is never sterile, the subsequent native medicine rubbed on the end of the cord must be far from sterile, and no further dressing or treatment is done. Is it, then, possible that the infection which we do see in England is predisposed to by the devitalization of the tissue distal to the ligature which we habitually place on the divided cord? Further, as the cord separates normally at the skin level and not at the level of the applied ligature, what further call is there to ligate it at all? In imitation of native practice, I have been simply dividing the cord with sterile scissors and putting on a sterile bandage. The results are excellent, and one avoids (a consideration in the conditions of native practice) the need for sterile suture, sterile forceps, and sterile water. It may be that in this one case it is the European who clings to the superstition and the native who knows the truth!

#### Scottish Medicinal Plants

Foxglove leaves, foxglove seeds, and rosehips are again required from the Scottish countryside for medicinal and dietetic purposes. Local arrangements for collecting and dispatching to the Scottish Medicinal Plants Scheme Collection Centre, Airdrie, are in the hands of joint committees of the Women's Voluntary Services and the Scottish Women's Rural Institutes. Details of the scheme are given in a bulletin issued by the Department of Health for Scotland, who advise collectors on how to gather the plants and preserve their valuable content. Foxglove leaves, for instance, are best gathered in late June or July, when the flower is easily recognizable. The essential factor here is that the leaves should be dried as quickly as possible after picking. Foxglove seeds require less attention. They should be gathered about the end of July or August, when half to two-thirds of the capsules on the stalk have begun to split open, and are easily stripped from the plant and later spread on paper in a warm room to dry. A pillow-slip with the mouth fixed open with a hoop makes a good bag for collecting. Scotland's chief contribution to the laboratory is her rosehip crop, and it is hoped that this season will produce even more than last year's bumper crop of 70 tons. The hips are used to make syrup for children and infants to replace the vitamin C normally obtained from oranges and other fruits, and unlimited supplies are wanted. The hips are richest in vitamin content from the time they begin to change colour until they are fully red—normally from September onwards.

#### Vomiting of Pregnancy

Dr. WALTER CALVERT writes: The experience of Dr. Edwards (April 8, p. 512) in vomiting of pregnancy contrasts with my own. I believe, and teach, that many of the physiological and minor pathological phenomena of pregnancy are due to the high blood level of progesterone. This hormone relaxes plain muscle. Thus relaxation of the uterus protects the early pregnancy. Relaxation of the gut gives rise to constipation. Relaxation of blood-vessel walls causes the typical low blood pressure of pregnancy, and the varicose which are seen in various situations. Relaxation of the gastric plain muscle gives rise to vomiting. Accordingly I have

given stilboestrol 1 mg. t.i.d. for 3 days in many cases of vomiting, including quite severe hyperemesis. The results support the theory and are uniformly good. Of course the good results of "treatment" of any kind in these cases are well known.

#### Multiple Infestation with *Taenia saginata*

Dr. G. W. S. ANDREWS and Dr. A. C. OGILVIE, medical officers at an E.M.S. hospital, write: The following case may be of interest for two reasons: (1) Four scolices were recovered after a single dose of filix mas; (2) the present treatment with a single large dose preceded by sodium bicarbonate succeeded, whereas four previous treatments with filix mas in divided doses had been unsuccessful. A domestic servant aged 38 first noticed pain in the epigastrium and distension of the abdomen in Oct., 1942. Two months later white segments were observed in the stools, and she was treated with quassia enemata on two occasions. A few months later she again underwent treatment, this time with filix mas in divided doses. This was repeated three times in seven months. On admission to hospital in May, 1944, she was still passing segments, and treatment with filix mas was again tried. She was given fluids only and magnesium sulphate  $\text{ziv}$  mane for two days. On the third day sodium bicarbonate  $\text{ziii}$  followed 35 minutes later by liquid extract of male fern  $\text{ziss}$  were administered, and finally magnesium sulphate  $\text{ziv}$  after a further half-hour. From the material passed half an hour later a large number of proglottides and four scolices were recovered, which were identified as *Taenia saginata*. The success of this treatment was considered to be partly due to the action of the large dose of sodium bicarbonate in dissolving the mucus which always surrounds the scolex of the tapeworm where it is attached to the mucosa. Our thanks are due to Dr. E. Idris Jones, physician in charge of the case, for advice and help in the preparation of this note.

#### Simulated Epilepsy after Convulsion Therapy

Dr. G. CAMPBELL YOUNG writes from Bracebridge Heath Hospital: Sir Humphry Rolleston once suggested to his class as subject for a thesis—"Diseases caused by Treatment"—a fruitful field indeed. The following is an addition to the already long list. In the absence of my medical superintendent I was asked to see a case at another hospital in the county, a man who was having at least a dozen fits daily and was displaying rather troublesome automatic actions thereafter. Every kind of depressant drug had been given in large doses but without diminishing the number of fits. The case had been referred to a neurological hospital with a view to surgical treatment but had been rejected as unsuitable on the ground that the convulsions were so general that cortical localization was not possible. When I entered the room I recognized a somewhat shadow-like ex-patient of mine to whom I had given a short course of convulsor therapy and who had improved sufficiently to be discharged thirteen months earlier. On his locker was a carefully padded spatula to prevent tongue-biting. He looked at me vacantly and asked me if I were the new medical officer. I requested to be left alone with the patient, and on this happening he immediately said, "You are Dr. Campbell Young," and recalled his stay at Bracebridge and the treatment he had been given. He then described the fits he was having and announced that he would shortly have one, which he obligingly did, with a very fair imitation of a spontaneous or perhaps, more accurately, induced fit. Certification was advised and he again came under care at Bracebridge. All sedatives were withheld. He never had another fit and he is now in the course of being discharged from the R.A.F. Admittedly, the boy was a hysterical type, and had once, in my presence under slight stress indulged in a jaw-clenching, arm-throwing exhibition which, however, would have fooled no one. Even so, it would seem a fair assumption that, had not convulsion therapy been practised, no such orgy of epileptiform attacks would have occurred. Here was a youth aged 22 who had convulsed himself with such success as to convince observers and himself to the extent of risking the excision of part of his cerebral cortex to cure his self-inflicted "epilepsy". It is an interesting corroboration of the imitative faculty of the schizophrenic. The artificially induced convulsion has not apparently been exploited to aid those who coach the less enthusiastic conscript in the art of failing to pass their medical examination. I am indebted to Dr. Macarthur for giving permission for this to be published.

#### Corrigenda

Dr. C. BOWDLER HENRY wishes to correct the last sentence of the paragraph numbered 4 in his letter on "Dental Hygienists" published last week (p. 733). The course referred to occupied half a year, not one year.

A translation into English by Dr. A. Fry of the report by a Committee of Soviet Scientists on "Gas Infection of the Brain as a Form of the Serious Complications of Cerebro-cranial Injuries" was published in the *Journal* of June 26, 1943 (p. 785). A message from Moscow asks us to state that owing to an oversight the name of the author of this report was not given; his name is N. I. Grashchenkov.



## ANALYSIS OF SHOCK

BY

VIRGIL H. MOON, A.B., M.Sc., M.D.

*Professor of Pathology, Jefferson Medical College, Philadelphia, U.S.A.*

During a period of 40 years shock has been the subject of extensive and intensive study, both clinical and experimental. This has resulted in a mass of well-attested factual evidence, but agreement on the pathophysiological mechanisms has not been reached. Writers differ widely in their views, and readers are bewildered by the evidence set forth in support of the conflicting opinions. It appears that a logical correlation of the known facts is needed now rather than a search for new facts. A realistic examination of the causes for disagreement may be illuminating.

## What is Shock?

The broad and indefinite use of this term is not the least among several causes for disagreement. *Shock* has been applied to a number of unrelated conditions. Many regard it as a state of acute circulatory failure characterized clinically by prostration, apathy or stupor, tachycardia, feeble regular pulse, and diminished blood pressure. The peripheral temperature frequently is subnormal. When used in this sense shock includes several forms of circulatory disturbance having no other features in common; their pathogenesis and disorders of function are various. The effects of syncope, fright, exhaustion, anaesthesia, haemorrhage, primary shock, cardiac failure, or of secondary shock may produce the clinical signs mentioned. Each of these conditions may cause low blood pressure; hence it cannot be used as the criterion for differentiating them.

The attention of surgeons is focused chiefly upon shock seen in battle casualties and in those injured in accidents or air raids, and upon shock following extensive surgery. If, under these or other circumstances, a patient manifests the signs mentioned above, shock is regarded as present. Some writers recognize that at least *three unrelated mechanisms* may combine to cause weakness, pallor, feeble rapid pulse, and low blood pressure—interpreted clinically as shock—after traumatic injuries. Attention is invited to a brief consideration of each of these mechanisms.

**Primary or Neurogenic Shock.**—This is a neurovascular reaction like that of syncope or fainting. It may be excited by pain, fear, and the emotional effects of the injury, or by non-sensory nerve impulses arising in the damaged tissues. Primary shock comes on promptly, and is usually transient unless accompanied by extensive trauma or haemorrhage. In cases of severe abdominal injury, visceral perforations, pancreatitis, burns, or extensive damage to other parts, primary shock may merge gradually into secondary shock without an interval of partial recovery. This feature was emphasized by Cope (1928, 1935), Blalock (1940), and others.

Recent experiments (Phemister and associates, 1944) show that prolonged low arterial pressure can be produced in animals by continuous mild stimulation of afferent depressor nerves. Arterial pressures between 40 and 60 mm. Hg were maintained in some instances for several hours. The blood of such animals showed dilution regularly. This feature is opposite to that seen in secondary shock. It indicates that the mechanism of fluid balance is functioning normally and that the capillary walls are not abnormally permeable. Fluid balance and haemoconcentration will be discussed later. A decrease in total blood volume has not been shown in uncomplicated primary shock.

**Haemorrhage.**—The effects of haemorrhage are an obvious cause for low blood pressure and other signs of disturbed circulation after injuries. These signs may develop promptly from voluminous haemorrhage or gradually after slow or repeated small haemorrhages. The clinical signs of haemorrhage are like those of secondary shock, but they differ in other important particulars, as will appear presently. Haemorrhage directly lowers the total blood volume and is followed by a rapid dilution of the blood. This is accomplished by absorption of fluid from the tissues into the blood, tending to restore the blood volume. It is evident that the mechanism of fluid balance is operating physiologically. Low blood pressure developing shortly after trauma is due chiefly to neurogenic and haemorrhagic effects.

**Secondary Shock.**—This is the third mechanism by which circulatory deficiency may develop after extensive injuries. It is due to atony and abnormal permeability of capillary walls, and has been discussed (Moon, 1938a, 1942a, 1942b) as circulatory failure of capillary origin. Products of tissue autolysis or of infection, absorbed from damaged tissues, produce permeability of endothelium like the effects of histamine, peptone, venoms, and other capillary poisons. When this effect is produced in extensive areas it involves the mechanism of fluid balance. Osmosis requires the presence of a semi-permeable membrane—the endothelium. If the latter becomes so permeable that plasma colloids escape through it, osmotic attraction ceases to act and the mechanism of fluid balance is vitally deranged.

Leakage of fluid from the blood into the tissues lowers the blood volume and causes haemoconcentration, which is evidence in itself that the mechanism of fluid balance is not functioning adequately. Under normal conditions fluid lost from the blood is restored by absorption; haemoconcentration is thereby prevented.

Decreased blood volume, combined with increased volume capacity of the capillary bed, tends to cause circulatory deficiency, which is manifested by clinical signs like those of primary shock or the effects of haemorrhage. But the mechanism of capillary damage requires time for development; it is never seen immediately after injury, hence it is called *delayed or secondary shock*.

## Confusion in Shock Analysis

Numerous reports, both from British and from American authors, indicate confusion in attempting to analyse the causes of shock resulting from injuries. Space does not permit detailed examination of each of these. Since the reports are similar in nature and in the conclusion drawn, one will be cited as an example.

Evans and his associates (1944) made haematocrit and blood-volume determinations in 143 cases of knife wounds, bullet wounds, and accidental injuries. Many of these developed shock, as indicated by low blood pressure and other clinical signs. Haemodilution was present in the majority; a few showed haemoconcentration. The authors concluded that low arterial pressure is the most useful criterion for shock and that haemorrhage is its most important cause. It was stated that the injured were seen *soon* after the wounds were received. Hence probably the time factor was not sufficient for the development of secondary shock. In many instances there was haemodilution, and evidence of extensive haemorrhage which averaged 38% of the estimated blood volume. It is probable that primary shock and haemorrhage were chiefly responsible for the low blood pressure.



It seems remarkable that such numerous and important differences escaped the attention of those who have written voluminously on haemorrhages as the cause for shock. More remarkably, a few even advocate haemorrhages as the method of choice for producing shock experimentally. Let it be emphasized that haemorrhages, when present, are a highly important contributory factor; an animal or person in shock may not survive a minor

haemorrhage which under normal conditions would have insignificant effects. But haemorrhages alone, independent of trauma, anaesthesia, or toxic effects, will not produce the syndrome of secondary shock.

#### Contrasted Features

Items	Shock	Haemorrhages
Endothelium .. .. .	Permeable to colloids	Impermeable
Flow of lymph .. .. .	Increased	Decreased
Tissue fluid .. .. .		
Fluid balance .. .. .	Disturbed	Undisturbed
Absorption .. .. .	Impaired	Unimpaired
Vomiting .. .. .	Persistent	No vomiting
Diarrhoea .. .. .	Frequent	Absent
Saline solutions, intravenous .. .. .	Ineffective	Often effective
Renal:		
Excretion .. .. .	Deficient	Unimpaired
Urine .. .. .	Concentrated, low volume, albumin, erythrocytes, bile, debris	No characteristic changes
Blood:		
Congulation time .. .. .	Lengthened	Shortened
Concentration .. .. .	Increased	Decreased
Non-protein nitrogen .. .. .	"	"
Potassium .. .. .	"	Terminal increase
Plasma chlorides .. .. .	Decreased	Increased
Necropsy findings:		
Oedema of soft tissues .. .. .	Characteristic	None
Serous effusions .. .. .	Present	Absent
Capillo-venous congestion .. .. .	Characteristic	"
Petechiae .. .. .	"	"
Visceral ischaemia .. .. .	Absent	Present
Organ weight .. .. .	Increased	Decreased
Gastro-intestinal tract .. .. .	Dilated, atonic	Contracted
Parenchymal necroses .. .. .	Present	Absent

#### Circulatory Dynamics

The principles of capillary physiology (Starling, 1909; Ebbecke, 1923; Lewis, 1927; Krogh, 1929) serve to explain how various noxious agents produce circulatory deficiency. A diversified group of substances which affect endothelium deleteriously are known as capillary poisons. These include extracts of normal tissues, products of tissue autolysis, foreign proteins and protein-split products, bacterial substances, histamine, bile, venoms, poisons, metabolic products, and even moderate lack of oxygen. It was established that any kind of injury to endothelium increases its permeability to the plasma colloids. Thereby other dysfunctions result as shown in the following table:

Agents or conditions injurious to endothelium	Pathological effects:
	Endothelial permeability
	Disturbance of fluid balance
	Oedema of soft tissues
	Serous effusions
	Increased flow of lymph
	Haemoconcentration
	Capillo-venous congestion
	Stasis
	Petechial haemorrhages

Permeability of capillary endothelium lowers both the actual and the effective blood volume. Leakage of plasma into the tissue spaces reduces the *actual* blood volume and causes haemoconcentration, while sequestration of blood by stasis in dilated capillaries and venules reduces the *effective* blood volume. This combination leads to a disparity between the volume of blood and the volume capacity of the vascular bed. Such a disparity produces a circulatory deficiency superficially resembling that resulting from haemorrhages. Physiological reactions compensate for minor degrees of such a deficiency. Activity of the sympatho-adrenal system causes arterial constriction, stimulates cardiac function, and causes the spleen to contract, discharging its reserve of blood into the circulation. Selective distribution of blood favours the vital organs at the expense of non-vital parts. Peripheral circulation is reduced, and the external parts become pale, cold, and almost-pulseless.

So long as this compensation is effective there is no marked decline in the arterial blood pressure, but the latter is maintained at the expense of the volume flow. Stagnation of circulation in the dilated capillaries reduces the amount of venous blood returned to the heart. This lessens the cardiac output and decreases further the volume flow. A reduced delivery of oxygen to the tissues follows, with accompanying anoxia, which of itself causes further relaxation and permeability of capillary endothelium (Krogh, 1929; Landis, 1934, 1937). This feature introduces a self-perpetuating factor into the mechanism, causing it to progress in a vicious circle. When finally the compensatory reactions are no longer adequate the blood pressure declines progressively

and the complete syndrome of shock is manifested clinically. The items which constitute that syndrome were tabulated above in the comparison between shock and the effects of haemorrhages.

Circulatory deficiency originating in the capillaries produces the pattern of visible changes in the viscera described in a preceding section. The capillaries and venules become relaxed and distended with closely packed corpuscles, stagnation of circulation develops; stasis is the surest sign of increased capillary permeability (Landis, 1934, 1937). The leakage of plasma causes oedema of soft tissues and effusions into serous cavities. Dissolution of capillary walls causes minute haemorrhages in mucous and serous surfaces and in parenchymatous tissues. These changes are seen in varying degrees when secondary shock from any cause has been the major factor leading to death.

We have noted that marked hyperaemia and petechial haemorrhages predominate when severe shock has led to death in a few hours. Serous effusions and oedema are prominent when the deficiency has developed more gradually, leading to death after 24 hours or longer. We were able to produce pulmonary oedema experimentally (Moon and Morgan, 1936) by burns of moderate extent, by tissue autolysis *in vivo*, and by injections of various capillary poisons. To accomplish this it was only necessary to decrease the dosage of the agent so that fatal circulatory failure might develop more slowly. Partial circulatory stasis and oedema of the lungs predispose to pneumonia. We have reported (Moon, 1938b) on secondary pneumonia as a terminal event in shock of sublethal degree.

#### Half-truths

Erroneous beliefs persist longer when supported in part by truth than when entirely false. Propaganda is far more effective when based upon a modicum of fact; likewise in scientific matters. One example has been seen in the belief that shock from trauma is due entirely to haemorrhage. Another instance is the interpretation that leakage of plasma locally is the cause for low plasma volume.

The decreased plasma volume which develops after burns is attributed by many writers entirely to capillary leakage in and about the burned area. Scant attention is paid to the fact that capillo-venous hyperaemia and oedema develop in extensive visceral areas remote from the burn. Long ago it was shown (Schjerning, 1884; Bardeen, 1896-7, 1897; Pack, 1926) that the brain and meninges, the lungs, gastro-intestinal tract, liver, and kidneys are markedly hyperaemic, that the soft tissues are oedematous, and that petechial haemorrhages are found in the serous surfaces, mucous membranes, and parenchymatous tissues of the viscera.

These changes are the characteristic pathological finding after death from burns. Yet some ignore them, unwilling to admit the systemic effects of substances absorbed from burned tissues. It is true that local loss of fluid occurs about injured tissues; but it is equally true that such loss occurs also in visceral areas after extensive burns or trauma. Local fluid loss is only part of the mechanism by which plasma volume is reduced.

Some writers attribute the visceral hyperaemia and oedema to anoxia, and explain that they occur during the agonal period just before death. Clinicians who have listened to the breathing of severely burned patients testify to the presence of congestion and oedema when shock is present *before the agonal stage is reached*. It is true that anoxia will cause capillary atony accompanied by hyperaemia, stasis, and oedema. But this is not a complete picture of the relationship. Capillary atony and anoxia have reciprocal effects: either of them acting primarily will bring about the development of the other. This relationship gives the disturbance a self-perpetuating quality which operates in a vicious circle.

So long as the physiological mechanism of fluid balance is functioning, local fluid loss is compensated by the absorption of fluid from the tissues elsewhere. This maintains the blood volume and concentration within normal limits. For example, large amounts of fluid may be lost from the blood locally, as in hydrothorax or ascites, yet neither shock nor haemoconcentration follows. It is my belief that haemoconcentration is evidence of capillary permeability sufficient in extent and degree to disturb the mechanism of fluid balance. This may at times result from the *local* effects of burns or trauma of great extent. It probably will not develop from limited injuries.

Any loss of blood or fluid is of importance when secondary shock threatens to develop. The importance of the local loss is in proportion to the amount of fluid loss. The explanation of low plasma volume and haemoconcentration as resulting from local fluid loss is another instance of a part-truth.

### Traumatic Toxaemia

During World War I the British Medical Research Committee organized a co-ordinated clinical and experimental investigation of shock following wounds. Eminent British, French, and American workers studied the manifestations seen in injured men and in experimental animals. These reports led to the theory known as *traumatic toxaemia*. It is summarized as follows:

"The theory of secondary shock which has the strongest support, both in clinical observations and in laboratory experiments, is that of a toxic factor, arising from damaged and dying tissue and operating to cause an increased permeability of the capillary walls and a consequent reduction of blood volume by escape of plasma into the lymph spaces. Thus the concentration of the corpuscles is also readily explained. It is recognized that, after a sufficient time, infection may occur and be of such character in itself as to induce a persistent low blood pressure. According to this theory there may be no essential difference between the effects of toxins given off by damaged tissue and of toxins resulting from activity of bacteria." (Med. Dept. of U.S. Army in the World War, 1927.)

The chief objection to this explanation is negative in character, based on the fact that no toxic substances had been shown experimentally or identified chemically in the blood during shock. Digressing for a moment, let it be noted that the same objections and logic apply equally to the bites of venomous snakes. No toxic substance has been identified chemically in the bitten animal's blood; I have seen no report on transfusion of blood from a bitten animal to a normal one; it is highly improbable that the amount of venom so transferred would cause notable effects. The bitten limb swells enormously and its tissues are distended with blood and fluid. May not the effects of a snake-bite be due entirely to local loss of blood and fluid in the area affected? This explanation would make unnecessary the assumption that a toxic substance produces systemic effects after snake-bites.

Presumably the toxic substances which result from trauma are cleavage products of tissue autolysis or of bacterial action upon tissue proteins. Chemical methods are not yet perfected to identify such substances in the blood, except as non-protein nitrogen. The latter is markedly increased during shock, and is attributed (Whipple and van Slyke, 1918; Whipple *et al.*, 1920) to destruction of the body's proteins. The objection mentioned took no account of these facts nor of the mass of clinical and pharmacological evidence indicating toxic effects.

Recent reports indicate toxaemic effects in experimental traumatic shock. Best and Solandt (1940) instituted exchange transfusion of blood between pairs of dogs, in one of which shock was induced by trauma. The untraumatized dogs developed shock, as did those traumatized. These results were interpreted as indicating the effects of a toxic substance released from injured tissues and conveyed by the blood. Kendrick, Essex, and Helmholz (1940) performed a somewhat similar experiment by exchange transfusion, which likewise furnished evidence supporting the theory of toxaemia. Even those who have opposed vigorously the conception of a toxic factor have now relaxed their opposition. For example, Frecman and his collaborators (1941) reported experiments on traumatic shock which they interpreted as indicating the effects of a toxic factor absorbed from the traumatized region.

This view is in agreement with an enormous mass of clinical and experimental data. It is based upon sound physiological principles and it is supported by necropsy findings. The pattern of circulatory changes seen in the viscera after secondary shock is of unmistakable significance. These changes indicate the origin and nature of the circulatory deficiency. The recognition of a toxaemic factor in secondary shock will abolish the most important cause for disagreement. Investigations on other features can then go forward in an atmosphere cleared of controversial discussions.

The basic principles on which agreement may be expected are as follows: Surgical shock, like that resulting from extensive trauma, is not due to a single cause but to a combination of causes: the anaesthetic, the local loss of blood and fluid, emotional

reactions, infection, or intoxication which may have reduced the patient's physiological state; the disease itself, which necessitated operation; and the absorption of toxic products from traumatized tissues. The relative importance of these factors varies in each case, and they operate in varying combinations. Some of these factors are lacking in shock from other causes.

It is now recognized that the occurrence of shock is not limited to traumatic injuries, burns, and the aftermath of extensive surgery. I have emphasized repeatedly that the same mechanisms operate in severe infections, metabolic intoxications, abdominal emergencies such as intestinal strangulation, mesenteric thrombosis, perforation, peritonitis, and from the effects of poisons.

### Renal Dysfunction

Deficiency of renal function is an item of importance in secondary shock from diverse causes. For example, extensive burns are followed promptly by oliguria or anuria, by a progressive accumulation of nitrogenous wastes in the blood, and by casts, red cells, pigment, debris, albumin, and other abnormal findings in the urine. This condition persists so long as the state of shock continues, and renal deficiency becomes prominent when patients survive for several days in a state of sublethal shock (Moon, 1942a). The excretion is inadequate, the non-protein nitrogen rises progressively, hyperazotaemia develops, and the clinical syndrome of uraemia often precedes death. Similar renal disturbance occurs in secondary shock from trauma, after extensive operative procedures, intestinal obstruction, metabolic intoxication as in diabetes, icterus gravis, toxaemia complicating pregnancy, anaphylactic reactions, transfusion with incompatible blood, poisoning with various drugs, and in severe infections.

An instance of sublethal shock leading to azotemia is that of the crush syndrome which Bywaters (1942) and others have reported. Victims of air raids had been pinioned under masonry and debris for hours. When rescued they developed signs of shock, which were counteracted by modern treatment. Despite the fact that adequate systemic circulation was maintained, these cases developed the complete syndrome of uraemia, and many died from progressive renal deficiency. When recovery occurred oliguria gave place to polyuria rather suddenly, renal function was resumed, and the non-protein nitrogen declined to a normal level. The findings at necropsy in some instances included congestion and oedema of the lungs and other viscera, as seen in secondary shock; in other cases the visceral appearances were not described. The traumatized muscles were pale, friable, and necrotic. The kidneys were pale, swollen, streaked with red and brown. The convoluted tubules showed varying degrees of degeneration, necrosis, and desquamation. The lumina contained hyaline casts, debris, and masses of brown pigment. This was shown spectroscopically to be myoglobin: its source as derived from damaged muscle is *prima facie* evidence of absorption from the traumatized areas.

This type of renal disorder was known to Osler and his contemporaries as "acute parenchymatous nephritis." They recognized its occurrence under several of the conditions previously mentioned. The syndrome is usually discussed as "extrarenal uraemia" by clinicians. Its pathology is not adequately presented in treatises on renal disease. Some describe it under "tubular disease," others under "nephrosis."

The exact nature and pathogenesis of renal failure accompanied by parenchymatous degeneration and necrosis in otherwise normal kidneys, as a complication of sublethal shock, is a subject for future investigations. There is suggestive evidence that the same injurious agents, including toxins and anoxia, which cause circulatory failure by their effects upon endothelium, likewise cause renal failure by their effects upon the parenchyma of the kidneys.

### Practical Considerations

"The best treatment for shock is prevention." To accomplish this it is essential to know the various conditions under which shock may develop. Hence not only after trauma, extensive surgery, or burns; but also in severe infections and intoxications, and in abdominal emergencies such as thrombosis, strangulation, perforation, and the like, the anticipation of shock may make its prevention possible.

Early amputation of mangled limbs, débridement of lacerated wounds, prompt local treatment of burns as by coagulation, surgical relief of an infarcted or strangulated loop of bowel, and the drainage of infected areas are procedures which may forestall the development of shock. Likewise the prevention of infection, by therapeutic or other means, removes a potent contributory factor. The careful surgeon reduces the danger of shock by reducing to the minimum both the depth and the duration of anaesthesia and by using regional or local anaesthesia when possible. General anaesthesia usually will not of itself cause shock, but it often leaves a narrow margin of safety when combined with other shock-producing conditions.

The successful management of secondary shock requires primarily that the conditions which caused it shall be obviated or removed; otherwise, efforts to restore the failing circulation are predestined to failure. For example, unlimited quantities of plasma probably would not prevent death from intestinal strangulation or from a crushed and mangled limb unless the causative condition could be obviated effectively.

### Traumatic Shock

The clinical signs of shock often develop after injuries of various kinds and degrees. Weakness, pallor, circulatory deficiency, rapid pulse, and low blood pressure are prominent features, but unfortunately these do not aid in determining either the type of the circulatory disturbance or the mechanism by which it developed. Those in whom these features are marked, apparently indicating severe circulatory failure, often recover promptly under appropriate treatment while others whose apparent condition is not alarming—they may even be ambulatory—may develop circulatory deficiency which progresses to a fatal termination despite all counteractive measures.

Experiences of this kind are well known to those dealing with accidental injuries. They have been noted especially among civilian casualties from air raids. Much confusion arises from the fact that many surgeons regard so-called *traumatic shock* as a disease entity. In reality it is nothing more than a symptom-complex, which is not a dependable index either of the nature of the disturbance or of its severity. When this syndrome is seen after injuries it is essential to differentiate between three conditions which may be operating singly or in combination. These are:

1. Primary or neurogenic shock, which may appear extremely grave and yet lead to prompt recovery. If the victim is seen within an hour or two after the injury, if the character and location of the wounds do not indicate considerable haemorrhage, and if examination of the blood does not show notable dilution or concentration, it is safe to assume that primary shock is the major factor. Any wounds should receive appropriate care, and enough morphine should be given to allay pain and apprehension. After rest, warmth, and ingestion of fluids, recovery from primary shock is usually prompt. The experiences of surgeons indicate that anaesthesia and operative procedures should be postponed, except emergency measures, until the patient reacts from the depressed circulation. In World War I special "shock teams" were employed in casualty clearing stations and field hospitals. They supplied dry clothing, administered stimulants, heat, warm drinks, and liquid nourishment. These measures were effective in the relief of primary shock in preparing the wounded for operation.
2. When loss of blood has been considerable the clinical signs will be like those in other forms of circulatory failure. If the person is seen within a few hours after the injury these signs probably represent the combined effects of primary shock and of haemorrhage. Examination of the blood may show which of these is the major factor. Haemodilution occurs promptly after haemorrhages; the degree of this is an approximate index of the amount of blood lost. Reports on large numbers of accidental injuries and casualties from air raids show that haemodilution is usually present. The conclusion that haemorrhage is the major factor in such cases is not open to question. The local treatment of the wounds and the restoration of blood volume, preferably by transfusion of whole blood, do not require consideration here. Cases of primary shock as haemorrhage, if not accompanied by extensive trauma, may show marked circulatory deficiency clinically, but they usually respond readily to treatment. A tendency to progress towards a fatal termination despite treatment is not a characteristic of such cases.
3. Delayed or secondary shock results from factors other than those which cause either primary or haemorrhagic shock. The fact that their clinical signs are the same is the chief source of confusion regarding shock following trauma. This condition requires time for development: except with cranial or abdominal injuries or extensive

burns, it is seldom seen until 4 or 5 hours after the injury. The chief cause for secondary shock is the absorption of toxic substances from damaged tissues. These substances originate in part from autolysis, in part from bacterial growth.

All accidental and battle wounds are grossly contaminated; bacteria, both pathogenic and saprophytic, multiply readily in the debris of damaged tissues. Probably the products of bacterial growth are more toxic than those of simple tissue autolysis. For example, shock developed more slowly and in less degree in crush injuries which were not accompanied by open wounds. When a similar amount of muscle tissue has been damaged and laid open, as by a shell fragment, the development of shock is more rapid and severe. Perhaps this is because products of bacterial growth are important factors in the latter instance.

It has been observed (Cope, 1928, 1935; Blalock, 1940) that a fall in blood pressure is not an adequate criterion for incipient secondary shock. Frequently, circulatory deficiency is developing while the blood pressure is well maintained or is even at its highest recorded point. So long as the mechanism of compensation is effective there is no marked decline of the arterial pressure; the latter indicates that the mechanism of compensation is failing and that the condition is becoming critical. An ominous fall in blood pressure is not a sign of incipient secondary shock; too often it is a sign of departed opportunity.

As stated earlier in this paper, secondary shock is accompanied by a disturbance of fluid balance which results from abnormal endothelial permeability. This disturbance affects the mechanism of absorption. Fluids given orally or subcutaneously are not absorbed. Thirst becomes incessant, but efforts to relieve it are followed by vomiting. The fluid vomited is often in excess of that swallowed, and the vomitus in this condition contains brown flecks—"coffee grounds" vomitus. These flecks contain haemoglobin: they result from capillary haemorrhages in the gastric mucosa.

### Haemoconcentration

Abnormal endothelial permeability which disturbs fluid balance results in haemoconcentration—a distinguishing feature in this type of shock. This feature is valuable both in recognizing the type of circulatory deficiency and in noting its progress. Haemoconcentration may be shown by counts of erythrocytes, by haemoglobin readings, by haematocrit, or by the specific gravity of the whole blood. My personal preference is for erythrocyte counts. Whichever method is used, a reading should be made when the injured person is first seen. Subsequent readings at intervals of one to three hours will furnish valuable evidence as to the nature and progress of the condition.

Unfortunately haemoconcentration may be masked by the haemodilution resulting from associated haemorrhages. Also, the victim may have had some degree of anaemia before the injury. For example, an erythrocyte count of 5,000,000 appears normal, but in one whose previous count was 3,500,000 it would indicate more than 40% haemoconcentration.

If the first examination shows moderate haemodilution it is apparent that haemorrhage is the major factor; subsequent findings of the same degree or of lower dilution would likewise indicate haemorrhage. But in the same case a subsequent finding of a higher concentration some hours after the injury indicates that secondary shock is developing in one previously affected by haemorrhage or perhaps by anaemia. If a person seen for the first time four hours or longer after injury shows clinical signs of shock not accompanied by haemodilution, it suggests that neither primary shock nor haemorrhage is the cause. Inadequate circulation developing some hours after injury, with approximately a normal concentration of the blood, is strongly presumptive of secondary shock in one who has lost blood by haemorrhage, or perhaps in a previously anaemic person.

The incipient stage of secondary shock unaccompanied by haemorrhage may be detected by the presence of moderate haemoconcentration—10 to 20%—even before evidence of circulatory deficiency is manifested clinically. This is seen frequently within an hour or two after extensive burns because shock develops faster after burns than after other injuries. If a subsequent examination of the blood shows a higher degree of concentration it indicates progress in the development of shock even though the arterial pressure may not be ominously low.

In order to treat the patient intelligently it is of advantage to know which condition or combination of conditions is responsible for the circulatory deficiency. A consideration of the time factor plus observations on the concentration of the blood may be distinctly helpful.

### Treatment

Several therapeutic misconceptions are prevalent concerning the treatment of secondary shock. There is no apparent basis for the belief that morphine is useful in counteraction or prevention. On the contrary, morphine is dangerous when given in full doses because it inhibits respiration and thereby increases anoxia, which is a major factor in this condition. Enough morphine should be given to allay pain and apprehension, but amounts sufficient to lower the respiratory rate will accelerate the development of secondary shock.

Experience has shown that stimulants, such as digitalis, strychnine, and adrenaline, not only are useless but may be distinctly harmful. Cardiac deficiency is not a factor in the development of secondary shock; the vasomotor system is active and the peripheral arteries are already contracted to the maximum. Under such conditions adrenaline cannot be expected to produce benefit, and it should be remembered that large or repeated doses will actually cause shock in experimental animals.

Another matter deserving thoughtful consideration is the application of heat in attempts to prevent or to counteract shock. It is natural that physicians should note the low peripheral circulation and temperature and should try to relieve them artificially. The application of heat is widely practised, perhaps without due consideration of the physiological principles involved. During shock and after haemorrhage the blood volume is reduced. There is not sufficient blood to fill the entire vascular bed and to support metabolism throughout the body. Physiological reactions compensate for this condition by a selective redistribution of blood, favouring vital organs at the expense of the external parts. The vascular channels in non-vital areas become collapsed and bloodless, but both circulation and metabolism are maintained where they are most needed.

It is possible to open up the peripheral vascular bed by the application of heat and stimulants. But this counteracts Nature's mechanism for conservation: the blood required to restore circulation in the external areas lowers needlessly the already depleted reserve of blood. Recent evidence, both experimental and clinical, indicates that the use of heat in the treatment of shock causes further circulatory deficiency and that the results are detrimental.

Those remedies which have proved useful are agents which tend to counteract one or another of the major items by which secondary shock develops or progresses; chief among these items are anoxia, endothelial permeability, and reduced blood volume. Lack of oxygen accelerates the development and progress of shock. The inhalation of oxygen aids in counteracting this and in preventing irreparable damage. It raises metabolic activity and tends to interrupt the action of the vicious circle even after shock has been initiated.

Physiological studies indicate that one function of the adrenal cortical hormone is to maintain the normal impermeability of endothelium. There is significant evidence, both experimental and clinical, that this substance is distinctly beneficial in the prevention and in the treatment of shock from burns (Wilson *et al.*, 1936; Rhoads *et al.*, 1941).

The successful treatment of shock requires, first, that the condition which caused it shall be removed; next, that the fluid which was lost from the blood be replaced by fluid which should approximate closely the composition of that lost. Thus after serious haemorrhages transfusions of whole blood provide the ideal remedy. But in shock accompanied by haemoconcentration whole blood is not so suitable; it does not relieve the haemoconcentration, which, because of viscosity, tends to impede circulation through the capillaries. The patient does not lack erythrocytes, but he sorely needs fluid to restore the blood to its normal composition and volume. These considerations indicate clearly that the ideal replacement fluid is either human plasma or serum.

These substances are now available in most hospitals and medical centres, either in the original form or concentrated or dehydrated. Plasma or serum, given in the normal or isotonic concentration, serves admirably as a replacement fluid to restore blood volume and to reduce haemoconcentration. But the same amount of plasma, concentrated to one-half or even to one-fifth of its original volume, is far more effective in counteracting both the low blood volume and the deranged equilibrium of fluids

which are prominent factors in the mechanism by which shock develops (Hill and Muirhead, 1942).

Concentrated plasma or serum, given intravenously, raises the osmotic pressure of the blood and thereby draws fluid from the tissues into the vascular system. This accomplishes several desirable results: it increases directly the total blood volume; it relieves the haemoconcentration, reduces the viscosity of the blood, and restores fluid balance; it tends to reduce the oedema of soft tissues; it also relieves the hypoproteinaemia which often is a notable feature. These effects increase the circulatory efficiency and the delivery of oxygen to the tissues. The relief of anoxia removes a most important factor from the vicious circle by which the deficiency progresses.

The foregoing considerations are not based upon personal experiences. They represent an analysis of the mechanism involved and a comparison of these with the recorded experience of physicians and surgeons.

Let it be emphasized that early recognition and treatment at or of the highest importance if favourable results are to be hoped for. Treatment, to be effective, must anticipate the complicated interplay of the agencies whose combined effects culminate in the syndrome of shock. It must be administered before the failing circulation and the associated anoxia have produced irreversible changes in tissues whose functions are vital.

### Summary

Confusion arises from the fact that three unrelated mechanisms may cause the clinical signs of shock following injuries. These are: primary or neurogenic shock, the effects of haemorrhage, and delayed or secondary shock. These may operate singly or in combination.

Traumatic shock is not a disease entity but a syndrome. It represents the summative effects of the three conditions mentioned. Each of these causes low arterial pressure, hence they cannot be distinguished by that criterion.

The physiological disturbances which accompany secondary shock are not the same as those of haemorrhage. Simple uncomplicated haemorrhages apparently will not produce this syndrome. But haemorrhage, when present, is a highly important contributory factor: a person in whom secondary shock is developing may not withstand the loss of an amount of blood which would be insignificant in an otherwise normal person.

Loss of capillary tone and abnormal permeability of endothelium are important factors in secondary shock. These have not been shown to play a part either in primary shock or in the effects of haemorrhage. Abnormal permeability disturbs the mechanism of fluid balance, leading to oedema of the viscera and to haemoconcentration.

A serious derangement of renal function accompanies secondary shock. This is seen not only after injuries and burns but also from the effects of intestinal obstruction, mesenteric thrombosis, metabolic intoxications, anaphylaxis, transfusion reactions, severe infections, and from the effects of various poisons. Patients who survive several days in a state of sublethal shock frequently develop the syndrome of uraemia and die of renal dysfunction.

The clinical management of shock requires the recognition of the causative mechanism. Cases of primary or haemorrhagic shock, unless accompanied by extensive trauma, respond more readily to treatment than do those of advanced secondary shock.

Observations on the concentration of the blood and a consideration of the elapsed time since the injury are valuable aids in determining which mechanism is the major factor causing circulatory deficiency.

Loss of blood volume is an outstanding feature after haemorrhages and in secondary shock. The one is best treated by transfusion of whole blood; the other by plasma or serum.

### REFERENCES

- Bardeen, C. R. (1896-7). *Jahns Hapks. Hosp. Bull.*, 8, 81.
- (1897). *J. exp. Med.*, 2, 501.
- Best, C. H., and Solandt, D. Y. (1940). *Canad. med. Ass. J.*, 43, 208.
- Blalock, A. (1940). *Principles of Surgical Care*, p. 101. C. V. Mosby Co., St. Louis.
- Bywaters, E. G. L. (1942). *British Medical Journal*, 2, 643.
- Cope, Zachary (1928). *Proc. roy. Soc. Med.*, 21, 599.
- (1935). *Early Diagnosis of the Acute Abdomen*, 7th ed., p. 111. Oxford Univ. Press, London.
- Ebbecke, U. (1923). *Klin. Wschr.*, 2, 1725.
- Evans, J. E., Hoover, M. J., James, G. W., and Alm, T. (1944). *Ann. Surg.*, 119, 64.
- Freeman, N., Cullen, M. L., and Schechter, A. E. (1941). *Bulletin of Sub-committee on Shock*, p. 58.
- Hill, J. M., and Muirhead, E. E. (1942). *Ann. intern. Med.*, 16, 286.
- Kendrick, D. B., jun., Essex, H. E., and Helmholz, H. F., jun. (1940). *Surg.*, 7, 753.
- Krogh, A. (1929). *Anatomy and Physiology of the Capillaries*, 2nd ed., Yale Univ. Press, New Haven.



- Landis, E. M. (1934). *Physiol. Rev.*, 14, 404.  
 — (1937). *Amer. J. med. Sci.*, 193, 297.  
 Lewis, Thos. (1927). *Blood Vessels of the Human Skin and their Responses*, Shaw and Sons, London.  
 Med. Dept. of the U.S. Army in the World War (1927). Surgeon General's Office, Washington, Surg. Division, Vol. 11.  
 Moon, V. H. (1938a). *Shock and Related Capillary Phenomena*, Oxford Univ. Press, New York.  
 — (1938b). *Arch. Pathol.*, 26, 132.  
 — (1942a). *Shock, its Dynamics, Occurrence and Management*, Lea and Febiger, Philadelphia.  
 — (1942b). *Amer. J. med. Sci.*, 203, 1.  
 — and Kennedy, P. J. (1932). *Arch. Pathol.*, 14, 360.  
 — and Morgan, D. R. (1936). *Ibid.*, 21, 565.  
 — Leiber, M. M., and McGrew, D. (1941). *J. Amer. med. Ass.*, 117, 2024.  
 Pack, G. T. (1926). *Arch. Pathol.*, 1, 767.  
 Phenister, D. B., Laestor, C. H., Eichelberger, Lillian, and Schachter, R. J. (1944). *Ann. Surg.*, 119, 26.  
 Rhoads, J. E., Wolf, W. A., and Lee, W. E. (1941). *Ann. Surg.*, 113, 955.  
 Schjerning, O. (1884). *Vierteljahrsschr. gericht. Med.*, 41, 24, 273.  
 Starling, E. H. (1909). *The Fluids of the Body*, Constable, London.  
 Whipple, G. H., Smith, H. P., and Belt, A. E. (1920). *Amer. J. Physiol.*, 52, 72.  
 — and van Slyke, D. D. (1918). *J. exp. Med.*, 28, 213.  
 Wilson, W. C., Rowley, G. D., and Gray, N. A. (1936). *Lancet*, 1, 1400.

## MENINGITIS DUE TO PITTMAN AND NON-PITTMAN STRAINS OF H. INFLUENZAE

BY

J. GORDON, M.D., D.P.H., M.R.C.P.

Senior Lecturer in Bacteriology, University of Leeds

HESTER E. de C. WOODCOCK, M.B., D.P.H.  
Acting Medical Superintendent, Fever Hospital, Leeds

AND

K. ZINNEMANN, M.D.

Lecturer in Bacteriology, University of Leeds

For the last few years treatment with sulphonamides has been extensively applied to cases of meningitis due to *H. influenzae*. In this country several cases treated successfully in this way have been recorded: Jones (1937), Teggart (1938), Roberts (1939), Sakula (1940), Harold (1941), Jacoby (1941), Archer and Singer (1943), Birch (1943), and Matthews (1943). None of these reports give any clue as to the serological type of the *H. influenzae* strains isolated. Two reports have been published in this country about unsuccessful treatment with sulphonamides of meningitis due to *H. influenzae*—Mackenzie, Page, and Ward (1940) and Jones and Sudds (1942). The latter paper is the only one in which a serological examination of the organism responsible was carried out; the culture was of the b type (Pittman, 1931).

A third group of papers give accounts of both successes and failures in *H. influenzae* meningitis (serological types not given) using the sulphonamides for treatment: Mutch (1941), Davies (1943), and Moir (1943). Davies and Moir, however, emphasize the importance of using large doses of these drugs at an early stage. Moir also stresses their continued use after meningeal symptoms have disappeared, in order to avoid relapses. Mutch has suggested that strains isolated in this country should be examined not only culturally but also serologically. Mutch and Davies are not very favourably impressed by the curative value of these drugs in this condition, particularly with infants.

### American Views on Treatment

American publications on this subject are more numerous, and several reviews have been published: Bigler and Haralambie (1939), Aléman (1940), Neal, Appelbaum, and Jackson (1940), Lindsay, Rice, and Selinger (1940), Alexander (1941), Mitchell (1941), Neter (1942), Alexander, Ellis, and Leidy (1942), and Knouf, Mitchell, and Hamilton (1942). The general tone of the reviews is that sulphapyridine is more useful than sulphaniilamide in the treatment of these cases, and some authors claim that the combination of an antiserum to *H. influenzae* and sulphapyridine provides the best form of treatment available at present. Neal, Appelbaum, and Jackson (1940) reported on 29 patients, 20 of whom were treated with this combination, 9 being given sulphapyridine alone. Of the 29 patients 14 recovered. The mortality rate was therefore 52%. Of the

14 patients recovered 5 had received the drug alone. Lindsay, Rice, and Selinger (1940), in reviewing 108 cases, showed that treatment with antisera reduced the mortality from 97% to 83%: by adding sulphaniilamide and sulphapyridine the mortality for 13 cases was further reduced to 54%. Knouf, Mitchell, and Hamilton (1942) report altogether on four comparable series of 63 patients treated during the last 10 years. Group 1 consisted of 19 patients treated only symptomatically. In this group all patients died. Group 2 also had 19 patients. These were treated with anti-influenza serum. All died. In Group 3, which consisted of 13 sulphaniilamide-treated patients, there was one survivor. Group 4 was made up of 12 patients, with 9 survivors, or a mortality of 25%. The patients in this group were treated with sulphapyridine.

### Strains of *H. influenzae*

Pittman (1931) had shown that the majority of *H. influenzae* strains isolated from meningitis cases in the United States belonged to a special group of this organism, which is characterized by possessing a capsule consisting of carbohydrates. This capsule has antigenic properties. Six different types of capsular antigens can be differentiated, and the American meningitis strains belong mostly to Type b. According to Pittman capsulated strains have a smooth appearance, but the colonies are rough when the strains lose their capsules, whereas the strains usually isolated from the respiratory tract are non-type-specific and have a rough appearance when first isolated. Fothergill and Chandler (1936), on the strength of virulence and agglutination experiments on dissociated smooth strains, regarded all rough strains as avirulent variants of *H. influenzae*. Pittman (1939) could protect mice easily with sulphapyridine against infection with *H. influenzae* (non-type-specific). Pittman (1942), using *H. influenzae* (Type b) and confirming the findings of Povitzky (1937) with meningeal strains, showed that in experimental infections of mice the combination of antiserum and sulphapyridine gave a higher percentage of cures than either of these substances alone. Pittman (1942) also found sulphaniilamide not very effective as compared with sulphapyridine, sulphathiazole, and sulphadiazine; furthermore, that several strains of *H. influenzae* (Type b) showed different sensitivity to the drugs. There are two fatal meningitis cases on record (Pittman, 1933; Mulder, 1939) in which rough strains (non-type-specific) were isolated from the cerebrospinal fluid. Neither of these two cases was treated with sulphaniilamide or any of its compounds. Pittman (1931) has shown that rough strains, and Allison, Gordon, and Zinnemann (1943) have shown that respiratory strains not belonging to the Pittman types, are virulent for white mice, although this virulence is lower than that of strains of the Pittman types. In view, therefore, of the small number of cases reported as being due to non-capsulated strains of *H. influenzae*, and their theoretical importance, we are recording the following cases of meningitis, which responded very well to sulphapyridine and which could be shown not to belong to any of the Pittman types.

### Non-Pittman Type of Meningitis treated with Sulphapyridine

Case 1.—G. R., aged 7. Fell from tricycle Aug. 14, 1942. Persistent headache and vomiting since. On admission, Aug. 21, T. 97.6°, P. 92, R. 20; appeared fairly well; quiet. Pupils equal, reacted briskly. Some neck rigidity. Abdominal reflexes equal and active. Knee-jerks—R. normal, L. almost absent. Triceps jerks equal. No Kernig, no Brudzinski, no Babinski. Tone of limbs normal. Swelling size of a walnut L. occipital region. Lumbar puncture: 10 c.cm. fluid removed; no increase of pressure; fluid slightly turbid. Aug. 22: Mentally very bright; no pain; neck rigidity marked; Brudzinski positive; Kernig negative, but test causes obvious pain; knee-jerks not obtained; T. 100°, P. 114, R. 22. Aug. 23: Neck rigidity less; T. normal, and never raised again. Aug. 24: Cyanosis (from sulphapyridine). Aug. 25: Neck rigidity almost gone. Aug. 27: No neck rigidity; no knee-jerks, otherwise appeared normal. Sept. 5: Discharged quite well. Treatment:—Aug. 21: Sulphapyridine 2 g. (4 tablets) stat.; 1.5 g. four-hourly for 24 hours; alkaline mixture (pot. cit. gr. 40, sod. bic. gr. 20) given four-hourly along with sulphapyridine. Aug. 22: Sulphapyridine 1 g. four-hourly. Aug. 24: Sulphapyridine 0.5 g. four-hourly. Aug. 26: Sulphapyridine discontinued. Total dose of sulphapyridine, 26 g.

Case 2.—T. S., aged 5. Admitted March 3, 1943. Since March 1 had had headache and vomiting. On admission did not seem ill;



these is the sulphonamide or para-amino-phenyl-sulphonic radical,  $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot$ . Of the 40 cases 16 were of this type. Two cases not included in this group, however, behaved in a peculiar manner. They were both eczemas, highly sensitive to small doses of sulphanilamide but not to small doses of other sulphonamides. Each of them reacted to other sulphonamides in heavy dosage, with mild eruptions only. This reaction included a selective flare-up of the sites of previously positive sulphanilamide skin tests, but not of the negative tests to other sulphonamides. Had they been allergic to the sulphonamide group they should have reacted to all these in roughly equal amounts (1 g. of sulphanilamide or sulphanilic acid is equivalent to about 1.5 g. of sulphapyridine or sulphathiazole). The marked difference suggests that a small quantity of sulphanilamide or closely related compound may be formed in the body from the other sulphonamide drugs.

**Allergy to Other Drugs.**—Rogers (1938) described a case in which the administration of sulphanilamide caused a flare-up of the sites of several previous reactions to procaine. Procaine has the formula  $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{COO}\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{N}(\text{C}_2\text{H}_5)_2$ . It therefore has in common with the sulphonamides the amino-phenyl radical,  $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot$ . Skin tests with procaine were made on 14 of the above cases allergic to multiple sulphonamides. Seven gave positive reactions. Four of these were tested with full oral doses of phenazone, which carries the radical  $\text{NH}\cdot\text{C}_6\text{H}_4\cdot$ , but none gave any reaction.

A possible case of sensitivity common to both sulphathiazole and arsphenamine, which also contains the amino-phenyl radical, has been reported by Weinstein and Domm (1941).

### Summary

The specificity of the sensitivity in 40 cases allergic to sulphonamide drugs has been investigated.

In 60% the allergy was confined to one sulphonamide drug. In 40% it occurred to multiple sulphonamides and to sulphanilic acid.

In about half of the latter allergy was to the sulphonamide radical,  $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot\text{SO}_2\cdot$ . In the other half it was to the amino-phenyl radical,  $\text{NH}_2\cdot\text{C}_6\text{H}_4\cdot$ , reactions also occurring to procaine.

No cases were seen in which the sensitization was to still smaller groups than these.

I wish to thank the Commanding Officer, 1 N.Z. General Hospital, and the staff of the hospital, for the facilities and assistance in carrying out this work; and the Director of Medical Services, 2 N.Z.E.F., for permission to publish this report.

### REFERENCES

- Bloom, D. (1942). *Arch. Derm. Syph.*, Chicago, 46, 461.  
Costello, M. J. (1943). In discussion on Rosen I., *ibid.*, 47, 281.  
Erskine, D. (1938). *Brit. J. vener. Dis.*, 14, 39.  
Goodman, M. H., and Arthur, R. D. (1941). *Arch. Derm. Syph.*, Chicago, 43, 692.  
Haviland, J. W., and Long, P. H. (1940). *Johns Hopk. Hosp. Bull.*, 66, 313.  
Moeschlin, S. (1942). *Schweiz. med. Wschr.*, 72, 510; *abs. Bull. War Med.*, 1943, 3, 294.  
Park, R. G., and Platts, W. M. (1942). *British Medical Journal*, 2, 308.  
Rogers, E. B. (1938). *J. Amer. med. Ass.*, 111, 2290.  
Swartz, J. H., and Lever, W. F. (1943). *Arch. Derm. Syph.*, Chicago, 47, 680.  
Weinstein, M., and Domm, A. H. (1941). *J. Amer. med. Ass.*, 117, 607.

## TREATMENT OF PULP INFECTION OF THE FINGERS IN THE FIELD

BY

T. DENNESS, M.B., B.S.

Major, I.M.S.

The following is based on observations made after three years in casualty clearing stations, during which time a large number of these cases have been treated. The main object of treatment was to avoid evacuation to the base, and to return the patient as soon as possible to his unit.

There is little need to labour the disability caused by a stiff and painful finger, especially if it be the index finger of the right hand. The finger may be merely useless or, as often happens, an actual hindrance, interfering with the use of the whole hand. It is not proposed to discuss the aetiology at length. Septic cuts, scratches, and unnoticed pricks are probably the chief precipitating causes. Contributory are the difficulties of ensuring asepsis by reason of water shortage,

dust, and the nature of the man's work; this is particularly so in the case of small parties.

Pathologically the lesion is at first a simple pulp infection, though lymphangitis, lymphadenitis, and general symptoms are not slow in supervening; untreated or inadequately treated bone necrosis follows with depressing frequency, with its consequent increase in the period of disability. The symptoms of the established case need little description. Severe and throbbing pain and complete loss of function are the salient features. General symptoms may be fairly severe, with headache and pyrexia; the finger is tense, red, and extremely tender. Here it may not be out of place to emphasize that the utmost gentleness in examination is essential. The patient will have to be re-educated in the use of the finger and hand: the more pain he suffers, the longer this is going to take.

### Management of Cases in Detail

The successful management of these cases calls for attention to detail: a man may be off duty longer with a whitlow than after appendicectomy. In my experience, conservative methods are unavailing; the sulphonamide drugs are useful, but they will not cure the patient without surgical treatment. The primary stage in the treatment is the establishment of adequate relief of tension, and that as soon as possible. "Waiting for pus to form" is mentioned only to be condemned.

The operation is simplicity itself, and I have done many in field ambulance dressing stations with entirely satisfactory results. The anaesthetic of choice is pentothal sodium or some other intravenous barbiturate. If possible, this is preceded by morphine gr. 1/4 and hyoscine gr. 1/150. Adequate drainage is secured by laterally placed bilateral incisions, the pulp space is freely opened with fine Spencer Wells forceps, and a piece of glove rubber drain put across. The incision should not, and need not, traverse the flexure creases of the finger. For infections in the terminal phalangeal area it is, I think, not necessary to carry the incision in an acute case right across the tip of the finger. The drain is taken out after 48 hours; gauze and thick rubber drain are inferior to glove rubber in every way.

The incision of the whitlow is by no means the end of the case from a surgical standpoint. Morphine should, I consider, not be withheld for the first two nights, as a transient increase in the swelling may follow the incision. The incision is dressed once daily with hypertonic saline: Lieut.-Col. P. D. Johnson has suggested the use of sterile 12% sodium sulphate, and in my personal experience this is excellent. Every three hours warm sterile solution is poured over the dressing, which is undisturbed. Heat by means of a hot bottle or, if available, an electrically heated blanket is applied continuously for the first three or four days. I am not convinced that the sulphonamides greatly influence the condition, for after drainage the lymphatic and general conditions rapidly subside.

As soon as the incisions are clean, and swelling is subsiding, the encouragement of active movements should be begun. At no time should any attempt to force movement be made: it merely brings home to the patient that his finger is painful and useless. Progress is neither rapid nor spectacular. When incisions are healed the whole hand is placed in warm water and active movements persisted in. Passive movement is the worst form of interference. The man must be given to understand that further progress depends upon himself. This is the most difficult and trying part of all: it may take up to three months to secure full return of function. This time can be spent usually in the man's unit, supervised by his medical officer.

### Summary

This paper on pulp infection of the fingers has been written largely from the military standpoint.

Emphasis has been laid on early, adequate, but not mutilating incisions to secure relief of tension.

Incisions are not to be made primarily to "find pus" but to prevent phalangeal necrosis by relieving pulp-space tension. Reliance should not be placed on the sulphonamide drugs as substitutes for incision.

Prolonged soaking of the finger should be avoided, and a method of avoiding this is suggested.

Active movements should be encouraged and all attempts at passive forcing should be avoided.

Extreme gentleness in handling is at all times necessary in order to avoid psychological trauma as well as physical discomfort. A case which has been dealt with at the field ambulance is more comfortably evacuated to the C.C.S. than the patient upon whom no operation has been performed. The equipment necessary is found in every field ambulance and C.C.S.

In the presence of general symptoms it is a wise precaution to take a blood film in malarial areas. It is illuminating to note how often an attack of malaria is initiated by the whitlow.

I wish to thank Lieut.-Col. P. D. Johnson, R.A.M.C., for permission to write these notes and also for help given and suggestions made.

## EARLY OPERATION FOR VOLKMANN'S ISCHAEMIC CONTRACTURE

BY

G. A. POLLOCK, M.S., F.R.C.S.E., F.A.C.S., D.P.H.

Surgeon, Emergency Medical Service

The recognition and adequate treatment of Volkmann's ischaemic contracture in its early stages will result in a good functional recovery in most cases. Failure to appreciate the significance of the early developing signs of this lesion is, unfortunately, the cause of much subsequent disability and, not seldom, of even gross crippling deformity.

In a recent standard textbook on orthopaedic surgery, in a paragraph dealing with the question of operations designed to relieve intrinsic pressure on the vessels in the developing stages of Volkmann's deformity, it is stated that "as a rule damage is already irreparable when the arm is observed, and for this reason the operation is seldom applicable." Too complete an acceptance of this ruling will result in many cases progressing to ischaemic deformity which would otherwise have been prevented had the benefits of early surgery been sought. I believe that operative exploration is indicated if arterial damage is suspected, or where gross swelling of the forearm is associated with beginning contracture of the fingers which has not responded to routine treatment. The case history given below demonstrates the good results which do follow surgery in the early stages:

### Case History

While on Army manoeuvres on Dec. 4, 1943, the patient, a well-developed man of 24, was hit accidentally by fragments from a ricocheting bullet. He felt an immediate burning sensation in the left forearm. A first-aid dressing was applied and the patient was admitted to an E.M.S. hospital.

When examined in the hospital four hours after the injury several small wounds were seen on the flexor aspect of the proximal third of the left forearm. There had been very little bleeding. Flexion and extension of the elbow were full and painless, but supination and pronation were reduced by 50% and were accompanied by pain. The fingers were slightly flexed, but could be extended at the metacarpophalangeal joints. There was no loss of sensation in the hand or forearm, and the radial pulse was easily palpable. Prophylactic doses of anti-gas-gangrene serum and antitetanic serum were given, and the administration of sulphapyridine was begun. The forearm was suspended from a Balkan frame to assist in venous return.

Three days after admission the range of movement of his fingers had increased, but there was a tendency to flex the wrist before full extension of the fingers was secured. Twelve days after admission to hospital four small pieces of metal were removed from the forearm under local anaesthesia. Following this minor procedure, the patient experienced an aggravation of pain in his arm and the degree of contracture of his fingers was found to have increased.

When seen on Dec. 24—20 days after injury—the muscles of the proximal part of the forearm were found to be hard, and the patient could not extend his fingers at the metacarpophalangeal joints without at the same time flexing the wrist fully. Volkmann's ischaemic contracture was diagnosed and surgical exploration decided upon. This was done through a linear incision on the volar aspect of the proximal third of the left forearm. The skin and fascia were incised, and superficial muscles which appeared normal were separated. When the insertion of the pronator radii teres was elevated and later partially incised, large blood clots welled up into the wound and profuse arterial bleeding occurred. This was found

to arise from a partially lacerated ulnar artery. No arterial spasm was present in either segment. Ligatures were applied above and below the laceration and the vessels divided. The deeper muscles were soft, dark red in colour, and failed to show any sign of contractility on stimulation even when a small section was removed from the flexor digitorum profundus for microscopical study. The divided structures were reunited, the wound closed in layers, and the wrist fixed in hyperextension on a dorsal plaster cast. A small rubber drain was left in for 24 hours.

The stitches were removed at the end of 12 days, when the wound was found to be well healed. There was still, however, slight flexion contracture of the distal phalanges of the index, middle, and ring fingers. Splinting in hyperextension was reapplied and physiotherapy by infra-red rays was begun. On Jan. 19, 1944 (26 days after operation) the patient had recovered full finger and wrist movement.

I am indebted to Col. W. F. Harvey for the following histological report: "The sections showed muscle fibres in various stages of degeneration or necrosis with loss of cross-striation in most cases. There was quite considerable longitudinal striation, although a large number of the muscle cells were amorphous and eosinophil. There was no fibrosis or inflammatory cell reaction. The appearances in these sections suggested the ischaemia analogous to Volkmann's ischaemia, possibly at an early stage before replacement reaction had taken place."

### Comment

(1) In this case I believe a secondary haemorrhage occurred when the foreign bodies were removed. (2) The increasing tension within the forearm deep to the flexor digitorum sublimis caused mechanical contracture of the fingers. (3) Relief of tension with splinting of the fingers in full extension permitted recovery to occur. (4) Without surgical treatment, replacement fibrosis of the necrosed muscle fibres would have "fixed" the existing contracture, and as cicatrization occurred this existing deformity would have become more pronounced.

I have to thank the Medical Superintendent of the hospital for permission to publish this case.

## Medical Memoranda

### Locked Twins

Though not quite as rare as was previously thought, a case of locked twins seems of sufficient interest to merit publication.

#### CASE HISTORY

Mrs. A., a primipara aged 30, expected her first baby on Dec. 22, 1943. I saw her for the first time on Nov. 27, for obstructed labour. During the previous three weeks her pregnancy had been mildly toxæmic; there had been oedema of the legs and abdominal wall, a systolic blood pressure of 150 mm. Hg, but no albuminuria, headaches, or ocular symptoms. Her pelvic measurements were normal. Labour started naturally on Nov. 26, 36 hours before I saw her; six hours previously she had been found to be fully dilated, and for four hours she had been making strenuous efforts to deliver herself.

On examination she was found to be getting tired, though by no means exhausted. On palpating the abdomen one child was thought to be present lying in the left occipito-posterior position. Limbs were felt anteriorly, and one foetal heart only was heard—in the left flank. Palpation was made difficult by the oedema of the abdominal wall. An anaesthetic was then administered; vaginal examination after catheterization revealed that the membranes were intact; these were ruptured, and the hand introduced to confirm the diagnosis of persistent occipito-posterior position. The head, however, was found to be in an occipito-anterior position. To ascertain the cause of non-descent the hand was inserted further into the birth-canal, and it was then found that a second head was lying in the brim of the pelvis, wedged between the head and shoulders of the first child and completely preventing the birth of either. It was found possible to push up the head of the second child about an inch: forceps were then applied to the head of the first child, which was delivered with little difficulty. The second child was then delivered with forceps; it was also in an occipito-anterior position, and delivery was even easier than the first. Very little liquor amnii escaped. There were no lacerations, and a single placenta was expelled ten minutes later. Post-partum haemorrhage was normal in amount. The uniovular boy babies weighed 5 lb. 6 oz. and 5 lb. 2 oz. respectively.

The puerperium was normal, the mother feeding both babies at the breast; their weights on discharge from hospital were both 5 lb. 4 oz. The blood pressure returned to normal, and the oedema subsided during the first few days.

The frequency of locked twins is said to be 1 in 90,000 deliveries—i.e., once in about every 1,000 cases of twin birth. This statement was made by von Braun of Vienna, but in view of the number of cases recorded during the last ten years it seems

that the condition is not quite so uncommon. It is indeed surprising that locking does not occur more often. Oligohydramnios has been observed in many of the recorded cases, and seems the most likely cause: it was undoubtedly present in the case reported above, in view of the fact that, though there were two children weighing over 5 lb. each, the size of the abdomen did not suggest to anyone who saw the case that there might be a twin pregnancy.

I have to thank Dr. A. G. Winter, of Crowborough, for permission to publish this case.

C. A. HORDER, F.R.C.S.,  
Hon. Obstetrical and Gynaecological Surgeon,  
Kent and Sussex Hospital, Tunbridge Wells.

### Latent Fractures of Vertebral Column after Aircraft Crashes

Three cases of fracture of the vertebral column after forced landings of aircraft were observed in a Polish Fighter Squadron within three weeks. Two of the accidents had occurred within a week of one another, and the third ten weeks previously. In each case there had been a latent period, varying from nine days to nine weeks, between the crash and the appearance of symptoms suggestive of fracture.

#### HISTORY OF THREE CASES

**Case 1.**—Flight lieutenant aged 30. Crash-landed on June 22, 1943. Sustained shock and severe cuts of the forehead. C.N.S. normal. Transferred to an E.M.S. hospital immediately after the crash and discharged as cured some weeks later. When on leave on Aug. 29 he felt a sudden pain in the back while digging in a friend's garden. His friend, who was a doctor, sent him for radiography, which revealed a crush fracture of the bodies of D.12 and L.1; this affected particularly the antero-superior border of each vertebra, the total vertebral border being only slightly reduced. This officer stated that he had had backache following the accident; but this had not been severe, and it had been vague in character. He was readmitted to hospital on Sept. 3 and discharged symptom-free on Sept. 29. No further symptoms have been complained of.

**Case 2.**—Flight sergeant aged 23. Forced landing on Sept. 2, 1943, with no visible injuries. Complained of pain in the right shoulder, which was x-rayed on the same day, no bony injury being apparent. There was no backache, and a physical examination revealed nothing abnormal. On Sept. 14 he complained of pain in the lower back, particularly on jumping from his aircraft to the ground. On examination there was some guarding of the lumbar muscles on the left, and he felt slight pain on bending the trunk to the right. Radiography on this date showed: fracture of right inferior articular process of L.5, obliquely upwards and outwards through the base; no displacement or deformity. He was admitted to hospital on Sept. 16 and was discharged symptom-free on Sept. 26. There has been no recurrence of symptoms.

**Case 3.**—Sergeant aged 27. Crash-landed on own aerodrome on Sept. 5, 1943. Had a cut of the head necessitating two sutures, otherwise no apparent disability. Detained in station sick quarters for 24 hours and discharged, after complete medical examination, without complaining of symptoms. On Sept. 14 he complained for the first time of pain in the lower dorsal vertebrae. Radiographs on the same day showed fracture of the inferior tip of the spinous process of D.7, with little displacement, and transverse fracture of the right inferior articular process of L.3, with no displacement. Detained in hospital until Sept. 20. Discharged symptom-free, and has not complained of any symptoms since.

#### COMMENT

All three fractures were anatomically different, although each was caused by a crash landing in the same type of single-engined fighter aircraft. These crash-landings were attended by varying degrees of damage to the aircraft, and by obvious injuries to the pilot varying from no visible injury in Case 2 to severe facial injuries and shock in Case 1. All three cases occurred among Polish personnel, although no specific significance can be attached to this.

A search in the literature has not revealed any similar occurrences. Rocher and Magnan (*Revue d'Orthopédie*, 1938, 25, 694), report three cases of fracture of the vertebral column following crashes of gliders from low altitudes. They state that these fractures are common after glider crashes, being next in order of frequency to those of the legs and the head. Their cases also show three anatomically different fractures, although each of these lesions at once caused symptoms, making a fracture apparent or probable. All three patients likewise made full recovery, only one (where financial compensation was involved) showing any delay in the resolution of symptoms.

It is felt that a number of undetected fractures of the spine may possibly have occurred through crash-landings, and it is hoped that this note may draw attention to their possible occurrence.

Our thanks are due to Wing Cmdr. T. Montgomery for permission to publish this report.

H. S. SAMUEL, B.A., M.R.C.S., L.R.C.P.,  
Squadron Leader, Royal Air Force.  
J. J.—, M.D.Cracow.  
Flight Lieutenant, Polish Air Force.

## Reviews

### FIELD SURGERY

*Forward Surgery in Modern War.* By Major-General W. H. Ogilvie, M.D., F.R.C.S., Hon. F.A.C.S., Hon. F.R.C.S.C., Army Medical Service. (Pp. 96; illustrated. 10s. 6d., plus 3d. postage; 5s. 6d. post free to doctors serving in H.M. Forces.) London: Butterworth and Co., Ltd.

"Field surgery," the author claims, "is the most important branch of military surgery because upon its quality all that follows will depend." With this there can be no argument. The need for a comprehensive work on the subject, based on hard experience in really modern warfare, has been felt for some time. That need has now been met, in the fifth year of war, by Major-General Ogilvie, who was consulting surgeon to the East African Force in 1941-2 and to the Middle East Forces from 1942 to February, 1944. The work, therefore, is an epitome of experience in East Africa, in Abyssinia, in the Western Desert, Libya, and Tunisia.

It is a slim volume, as any volume on field surgery should be, not merely for the pedestrian reason of easy carriage but because such a work should present principles rather than details. The latter, though important, will vary with every campaign, and field surgeons, not to mention administrators, must be adaptable. There is much also to be said for a work which is confined purely to field surgery, except for one chapter entitled "An Outline of Treatment at the Base." A good deal of confusion has been caused by articles, though not those written by men of genuine field experience, in which the advice given does not distinguish clearly or at all between field and base hospital surgery. Surgeons arriving fresh to the field after almost four years of war had much to learn. In the absence of casualties at home—even air-raid casualties are not really comparable—they presumably had taken their cues from published advice. The latter had been copious. Too much of it has been theoretical and "fancy." Yet if the brief papers published in this *Journal* in 1939 are re-read not much exception can be taken to the principles enunciated by men with long first-hand experience in the last war. Most of their observations have stood the test of time, even in a very different type of war, some of them, such as those of Col. J. M. Weddell on the possible drawbacks of air evacuation and on forward operating have been prophetic. But military surgery does not stand still any more than any other art, and its further evolution is here clearly traced.

General Ogilvie's work gives a realistic presentation. There is no forgetfulness that the first object in war is to win battles, that fighting materials must have priority over medical stores, and that surgery must adapt itself to the campaign in hand. Thus, while his advice on the siting and organization of units, on the arrangement of operating theatres, and on the categorization of casualties is clear, it is also elastic. On technical points he not only gives his personal opinions but calls in the wealth of the Middle East Memoranda on Surgery on various subjects. These memoranda, under his own editorship and often authorship, and those of his predecessor in office, Major-General D. C. Monro, not only have been a guide to Middle East surgeons but have been eagerly sought after and prized far and wide as the real substantial surgical advice in modern warfare. Thus we find also included here the advice tendered by specialists with field experience on resuscitation, burns, wound infection, neurosurgery, maxillo-facial surgery, and chest wounds.

What has the Middle East contributed to the art of field surgery that is likely to stand the test of other campaigns in different fields? In organization there have been the establishment of mobile surgical units and their exploitation to suit fluid warfare. Blood transfusion was, of course, making much headway in civilian practice, but its development and organization in the Middle East will surely serve as a model for the future. The employment of the sulphonamides has followed a similar pattern. In actual technical practices there are some changes unlikely soon to be discarded, even in the possible close fighting of future campaigns. Among these there is the undoubted success of the Tobruk plaster for the transportation of the fractured femur patient and the like. There is the

conservative attitude in chest surgery. There are the practices of exteriorization of the injured colon and of almost routine gastric suction in abdominal wounds. Of the last two the former seems to have eliminated the condition of "colon septicæmia" which in the last war characterized the spread of infection to retroperitoneal spaces; the latter has greatly diminished the dangers of the almost inevitable post-operative ileus.

This book makes a timely appearance and cannot but add to the war effort in a large and very special way. Many surgeons new to field work will presumably soon be actively engaged. Without even a preliminary canter on the farthest fringe of a battlefield they will find much that is strange. What the written word can do to remedy the defect of inexperience has been done here. It is a lucid and attractively written work. Above all it bears the hallmarks of authentic knowledge and intimate experience.

### YEARBOOK OF UROLOGY

*The 1943 Year Book of Urology.* By Oswald S. Lowmley, M.D., F.A.C.S. (Pp. 416; illustrated. \$3.00) Chicago: The Year Book Publishers.

Since research in urological problems has been disorganized by the war in a great many countries, few references are made in this edition to urological literature other than that published in the United States. But, the war notwithstanding, there is much to interest the reader in the 1943 yearbook. It contains descriptions of many new techniques in urological surgery. D. M. Davis's new operation for ureteral and uretero-pelvic stricture, which he calls "intubated" ureterotomy, is of great interest. It consists in splitting the strictured ureter longitudinally and wrapping the ribbon so formed round a large-sized catheter, which acts as a splint. Even though the ureter does not cover more than half of the diameter of its splint, a ureteral channel, normal in shape and size, will eventually be formed. To obtain this successful result it is essential that the catheter selected should be as large as will enter the uncut and presumably normal ureter and that it should be left in position for a minimum of three weeks. J. W. Lord, J. H. Eckel, and other researchers have been experimenting in a similar way with vitallium tubes in the ureters of dogs with good results. Another ingenious operation reported in the yearbook is the utilization of fascial strips obtained from the aponeurosis of the external oblique for reinforcing the female urethra in cases of stress incontinence. It sometimes happens that a surgeon is called upon to re-operate on a patient who has previously undergone an unsuccessful plication operation for this condition, and in such cases he often finds that the urethra has been so damaged that it is difficult to repair it. This difficulty can be overcome by the use of fascial strips according to the method suggested by A. H. Aldridge.

The 1943 *Year Book of Urology* is a very satisfactory publication, and supplies an easy method of revising recent advances in this important branch of surgery.

### RADIOLOGY OF BONES AND JOINTS

*The Radiology of Bones and Joints.* By James F. Brailsford, M.D., F.R.C.P. Third edition. (Pp. 440; illustrated. 45s.) London: J. and A. Churchill, 1944.

The third edition of this standard work shows that the war has not restricted Dr. Brailsford's energies. The method of presentation remains unaltered: the first two-thirds describe abnormalities and diseases as they appear in individual bones, and the final third gives general descriptions of bone diseases. The author has kept a close eye on the international literature, and no observation of importance has escaped him. There are well over 1,000 detailed references, and it is obvious that each author's work has been critically analysed before being included in the text. Dr. Brailsford has also carefully followed up many obscure cases for a long period of years and thus has been able to bridge the gaps in previous editions. The result is a considerable increase in the size of the volume, which is now a veritable encyclopædia of bone diseases.

It is not an easy book to read, and some of the descriptive terms must be incomprehensible to most doctors. Comparing the appearance of a march fracture with a plumber's wiped joint is an obvious example. This, however, is the only flaw in an outstanding book which has no parallel in the English language,

and should be kept for reference by every radiologist and hospital department. The illustrations are excellent, and special tribute must be paid to the author for personally compiling a first-class index.

### Notes on Books

No. 23 of *Individual Psychology Medical Pamphlets* is published at 2s. 6d. by the C. W. Daniel Company, 40, Great Russell Street, W.C.1. This collection of papers suffers from the fact that its appearance has been very much delayed, most of the addresses having been delivered to the Medical Society of Individual Psychology early in 1940 before the war had well begun. After a foreword by Sir Walter Langdon-Brown a past chairman reviews the history of the society and its present chairman forecasts a future in which he hopes to see it amalgamate all other medico-psychological societies and found a common journal. A paper by Dr. Sieckel describes how this one-time disciple of Freud has abandoned the sexual theory and admits that war neurosis may be the result of conflict between self-preservation and personal idealism; and it is interesting to note that his experience in the last war convinced him that the severe war neurotic could be cured only by excusing him future front-line service while retaining his self-respect by the fact that it was the doctor who took responsibility for this direction. Drs. Worsley and Barker discuss the approach to the patient, the first from the point of view of the modern common-sense eclectic psychotherapist, and the latter more from a Jungian standpoint. Next follows an excellent article by Dr. Dicks on analysis under hypnosis. He thinks it is useful in research into psychological mechanisms and in the reintegration of hysterics, but disappointing in the treatment of more severe cases. In a recent note he states that three years' further experience has not led to any modification of this view. Dr. Stungo adds a paper which, if rather more vague, comes to much the same conclusion, though he regards this form of therapy as a useful short cut in all forms of analysis.

Prof. JOHN ZAHORSKY assisted by Dr. T. S. ZAHORSKY has revised the popular *Synopsis of Pediatrics* (Henry Kimpton; 22s. 6d.) for a fourth edition. It is, indeed, a tightly compressed handbook in which the practical aspects of treatment are well stressed.

The Oxford University Press has published a shilling pamphlet for the Royal Institute of International Affairs entitled, *A Reading List for Relief Workers*. This bibliography, compiled in co-operation with some of the British voluntary societies most immediately concerned, is based on a selection of books that should prove useful to those who wish to take part in relief work in liberated territories. The publications are grouped under main headings.

Readers of previous editions of the *Year Book of Obstetrics and Gynecology* (Chicago: The Year Book Publishers; \$3.00) will no doubt have ordered their copy of the 1943 publication. Those who are not familiar with the series would be well advised to start the *Year Book* habit right away. It is an excellent method of keeping in touch with recent advances, and the editorial comments by Dr. J. P. GREENHILL are a useful guide to the busy reader. The literature of the year does not always record progress, and when authors advocate practices which would be generally dangerous—as, for example, accouchement forcé or the use of pituitrin in labour—their views are summarized and the dangers are expressed in no uncertain manner. Among the advances of the last year the over-publicized subject of caudal anaesthesia receives considerable prominence, and many readers will agree with the editor that "despite its auspicious start, continuous caudal anaesthesia will not become part of our general obstetric armamentarium." Analgesia and anaesthesia in obstetrics, the Rh factor, hormone therapy in all its manifestations, human fertility, are but a few of the subjects on which useful information is to be found. This book is an excellent investment for the busy practitioner.

A 14th edition of *The Pharmaceutical Pocket Book* has been prepared by the Codex Revision Committee of the Pharmaceutical Society (London: Pharmaceutical Press; 10s., postage 4d.). This work is the lineal descendant of a pocket notebook for students of pharmacy first produced in 1906. In the course of its evolution it has come to serve a twofold purpose: to introduce to students of pharmacy the fundamental principles on which the work of their profession is based, and to give the practising pharmacist a handy reference book. Opportunity has been taken in the present revision to delete sections which are no longer considered useful to the student or pharmacist, and to modify and expand other parts. Among the many changes in the text and tables mentioned in the preface, additions have been made to the Dictionary of Synonyms and Trade Names (which occupies 76 pages) in order to bring the particulars up to date with respect to the B.P. Addenda, B.P.C. Supplements, and new proprietary preparations. The section on food and diet ends with a tabular list of vitamin contents of official preparations.

## BRITISH MEDICAL JOURNAL

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## THE MEANING OF "SHOCK"

On the eve of one of the greatest battles in history the medical profession of this country may well desire some clarification of the problem of shock. In our present issue an analysis is presented by Virgil Moon, and with many of his views workers in this field will be in complete agreement. Yet there remains a considerable diversity of experimental evidence or deduction therefrom, and it is worth while to attempt an analysis which will make the problem less confusing to the mind unfamiliar with the technical aspect. Many of the obstacles to clear thinking seem to arise from the use of the single term "shock." Moon points out that "shock" is a syndrome of multiple aetiology, and Lewis<sup>1</sup> has recently reminded us that "diagnosis is a system of more or less accurate guessing, in which the end-point achieved is a name: these names applied to disease come to assume the importance of specific entities, whereas they are for the most part no more than insecure and therefore temporary conceptions." Has the time come to discard this term? "shock" is a disturbance of the circulation, then so is death; and it is as absurd to search for a single cause of the former as of the latter. If the term is retained it might be clearly understood that it represents only a convenient symbol for "low blood pressure associated with haemorrhage, burns, crushing injury, infection, cerebral injury, diabetic coma, coronary thrombosis, packed pulmonary embolism, etc." A telephone message that a casualty has been admitted in "shock" conveys very little; a message that the systolic blood pressure is 55 mm. Hg is a fact on which action can be taken. Authorities now agree that acute reduction of blood volume is of paramount importance in the low-blood-pressure states of casualties: first, because it is the commonest, and, secondly, it is the only cause which can be treated really successfully. They are far less agreed, and indeed are often silent, when it comes to explaining how a reduction in blood volume reduces the blood pressure. The usual explanation given is that diminished venous return causes diminished cardiac output. This explanation is meaningless in a closed elastic system in a steady state, for cardiac output and venous return are equal, and there is no means of telling which is the cart and which the horse.

Other methods of analysis, however, are becoming available. In the experimental animal the following important principle has been extensively used by Wiggers for study of blood-pressure changes: Mean blood pressure = cardiac output  $\times$  total peripheral resistance. In man the methods developed by Cournand and his colleagues<sup>2</sup> allow serial estimation of cardiac output and thus the use

of this formula. The analysis can be carried further, for though total peripheral resistance cannot be measured directly, blood flow through skin, muscle, brain, and possibly kidney can be estimated, so that an indication of the site of arteriolar vasoconstriction or vasodilatation may be obtained. Known factors affecting cardiac output are changes in venous pressure and heart rate, and substances that affect the heart directly. Thus the cause of a low cardiac output can be analysed by suitable physiological tests. For example, if the venous pressure is raised by a transfusion without any corresponding increase in cardiac output, then clearly the heart itself is at fault.

The data obtained by such methods are still scanty. Cournand and his colleagues<sup>3</sup> have published most interesting results in cases with low blood pressure after injury, and further important contributions are to be expected from this group of workers. It is already clear that mechanisms resulting in low blood pressure may be far more complex than the three suggested by Moon. Haemorrhage, for example, causes a steady fall in right auricular pressure and cardiac output, though blood pressure may be maintained, presumably by arteriolar vasoconstriction. The sudden fall of blood pressure which terminates a large venesection in man is apparently due to vasodilatation in muscle arterioles mediated by vasomotor nerves,<sup>4</sup> a reaction which may be identical with Moon's "primary or neurogenic shock." The steady fall in right auricular pressure on bleeding draws attention to reactions in the elastic venous system. If the pressure in the great veins is regarded as depending on the amount of blood in the venous system and the tone or tension of the veins, then it is clear that removal of blood can result in a fall of pressure only so long as venous tone does not increase. Slow changes in venous tone may, however, play an important part in the process of recovery, and may explain the surprisingly low circulating blood volume but normal systolic blood pressure found in a late phase after haemorrhage and in chronic anaemia. There is also the possibility that the sequence—low blood pressure, low cardiac output, low venous pressure—may result not only from a diminished amount of blood but from diminished venous tone.

The treatment of low-blood-pressure states at the present time is simple, for it consists solely of transfusion. Transfusion raises the venous pressure, and it is immaterial in practice whether the consequent rise of blood pressure results mainly from increased cardiac output or decreased arteriolar dilatation. If the blood pressure fails to rise after transfusion then there are three possibilities: first, the transfusion may be insufficient; this can be ruled out by simple clinical observation of the neck veins by the well-known methods described by Lewis, for if transfusion is continued until the veins of the neck show that the venous pressure is above normal, then no more can be expected from this method. Secondly, the heart may fail to increase its output on the raising of venous pressure; and, thirdly, the blood pressure may remain low from diminished peripheral resistance in spite of increasing the cardiac output. On failure of transfusion to raise the blood

<sup>1</sup> Lewis, *Lancet*, 1944, 1, 619.<sup>2</sup> *Proc. Soc. exp. Biol.*, N.Y., 1941, 46, 462.<sup>3</sup> *Surgery*, 1943, 13, 964.<sup>4</sup> Barcroft *et al.*, *Lancet*, 1944, 1, 489.



pressure, attempts may be made to use other agents, such as constrictor substances, digitalis, and oxygen if arterial oxygen saturation is low. Such methods, however, are likely to prove disappointing. For this reason there may be some disagreement with Moon when he decries the need for new facts. In view of species differences, especially those connected with the erect posture, and the far greater ease of making the fundamental circulatory measurements, such new data may well come from controlled observations on man himself.

## A NATIONAL PATHOLOGICAL SERVICE

We print elsewhere in this issue a memorandum, drawn up by a self-constituted group of leading pathologists, on the future of their specialty in a National Health Service. The White Paper, as they point out, has little to say on this aspect of medicine, and the arrangements by which it is to be enabled to play its proper part in an adequate medical service clearly call for consideration. These will not easily be made, for it is well known that present laboratory resources are quite inadequate; not only are they unprovided under the present system of National Health Insurance, but in many parts of the country distant from the larger cities laboratories staffed and equipped to undertake a wide range of pathological investigations do not yet exist. At the same time it is rather easier to visualize a national service for diagnostic pathology than for any other branch of medicine, because two examples of such a service on a limited scale have been in operation ever since the war began. The Emergency Public Health Laboratory Service, devised originally to reinforce existing safeguards against epidemics due to war conditions, has developed into a valuable instrument for organizing field investigations connected with epidemic disease and for encouraging prophylactic immunization, as well as providing greatly improved and extended diagnostic facilities. The system of reference laboratories, to which material for special and unusual investigations can be sent from any part of the country, is a good illustration of what can be achieved only by an organization on a national scale. The Sector system in London and the Home Counties is another example, more restricted geographically but far more inclusive in its scope. The Sector Pathologist, who is usually the pathologist in the principal London medical school in the Sector, is responsible for the staffing and administration of all laboratories in E.M.S. hospitals in his area. These sometimes include a Public Health Laboratory, and always laboratories part of the duties of which is to undertake any investigations required by private practitioners. Thus on occasion pathologists of academic standing who have eschewed private practice for years have been compelled to undertake it by virtue of holding a whole-time post under the Ministry of Health. Other E.M.S. pathologists, while perhaps not so unaccustomed to duties of this kind, have felt that they are thereby competing unfairly with their brethren in independent practice. In these areas, in fact, a national pathological service of a sort is already in being, and nothing but good can be done by stating plainly that some of those now

compelled to work in it will strongly resist any attempt to retain them in such a service after the war. It is obviously wrong that the occupant of a university chair, whose main duties are teaching and research, should be saddled with administrative and other responsibilities extending far and wide beyond the walls of his own institution. Such an imposition must tend ultimately to the appointment of good organizers rather than brilliant academicians, to the great detriment of pathological science in this country.

The keynote of the memorandum on page 790 is co-ordination, and this, it is suggested, could be achieved by pathologists themselves, provided that the administrative structure permits it. There must be three main branches—teaching and research, clinical pathology, and public health bacteriology—requiring separate staffs. The two latter may well be fused in small centres serving a population of 100,000; in large areas they should be distinct, but may with advantage be housed in the same building. The university department which is apparently visualized as the core and centre of an area in a national scheme should retain its academic freedom, and the professors in charge "should take no part in the professional administration of the hospital laboratories in the regions, and while they should be closely associated with pathologists engaged in diagnostic and prophylactic work they should not themselves be responsible for it." These departments should also be "the training centres of sufficient pathologists to supply the needs of the service." The free interchange of professional and technical staff, particularly in hospital laboratories, is thought desirable "in order to encourage efficiency, to prevent isolation, and provide for study leave and sickness." For the wide administrative responsibilities entailed in directing such a service a special type of officer is contemplated, who should preferably hold also a part-time university appointment; this is "a post requiring knowledge, experience, and tact, and should not be held by anyone too junior to command respect or too senior to have lost touch with bench work." A democratic note is struck in the suggestion that a representative committee of regional pathologists should have a voice in his appointment. A committee within each area of the Joint Authority, as forecast in the White Paper, is also suggested, which shall be representative of all the laboratories in the area and advise the authority on pathological matters. Another important recommendation, unconnected with the main theme of the memorandum, concerns the conduct of coroners' necropsies. It is suggested that there should be a small number of laboratories specializing in medico-legal work in its criminal aspects, working in close touch with the Home Office and attached to a university. For necropsies where crime is not in question the services of a senior hospital pathologist should be secured. We agree that the sooner the general practitioner is relieved of this responsibility the better; it is not only irksome to him, but, except in the most straightforward cases, not seldom quite beyond his capacity.

These and other recommendations in this memorandum call for very careful consideration. They furnish by no means a complete scheme, but they indicate the lines on which a national scheme might work without disrupting

this branch of the profession, and without placing new burdens on some of its most valuable members. How the efforts of the three authorities concerned—university, Ministry, and local or regional authority—are actually to be co-ordinated except by the efforts of pathologists themselves the memorandum does not attempt to suggest. What is quite clear is that almost everything remains to be done before pathology can take its place in a national medical service. The more undesirable features of present arrangements have been accepted by those concerned only as a war necessity, and originally with the idea that peace would see a complete restoration of the *status quo ante*. If they are to be perpetuated and extended this must mean rebuilding from the very foundations.

### THE STOMACH IN PERNICIOUS ANAEMIA

When reviewing recent work on the stomach in pernicious anaemia in 1940<sup>1</sup> we expressed the hope that we might be on the verge of far-reaching discoveries in alimentary physiology. This hope has unfortunately been disappointed. The suggestion<sup>2,3</sup> that the anti-anaemic factor might be secreted by the argentaffine cells of the alimentary tract was not supported by Magnus,<sup>4</sup> who found that these cells were often more numerous in pernicious anaemia than in health. Moreover, the pterins, which are the active principles of these cells, have not yet been clearly shown to have haemopoietic activity or to be related to the haematinic factor in liver extracts. Two recent papers do little more than confirm the view that the characteristic alimentary lesion in pernicious anaemia is destruction or atrophy of the secretory epithelium of the fundus and body of the stomach. Cox,<sup>5</sup> like previous authors, found that an outstanding characteristic was the contrast between the notable change in the mucosa of the fundus and body and the relative freedom from abnormalities in the pyloric zone. None of the findings varied consistently with the duration of the disease or the treatment, and they therefore do not support a suggestion by Wallgren<sup>6</sup> that inflammatory changes in the pylorus may have been removed by treatment with liver.

Wallgren found inflammatory exudation and degeneration of the glands in the pylorus in all his patients who had died before the introduction of liver therapy, though Brunner's glands in the duodenum were usually intact. This may be a disagreement about terms rather than findings, for there seems to be a fairly wide physiological range in the amount of infiltration of the interstitium and the degree of branching of the epithelium in the antrum.<sup>7</sup> Moderate degrees of simple atrophy and atrophic gastritis are so common, particularly over the age of 50, that they may almost be regarded as normal age changes. Gasroscopy is not of much value in determining the precise nature of the lesion in pernicious anaemia, for, although atrophic gastritis is characterized by a pale thin mucosa with a network of easily visible blood vessels, the gastroscopist fails in many cases to recognize proved atrophy of the intral mucosa.<sup>8</sup> Nevertheless, there is no doubt, even from Wallgren's own material, that the morbid anatomical lesion in pernicious anaemia may be entirely limited to the body of the stomach. Biochemical studies of the disorder are

still rather contradictory. Examination of the livers of patients dying from cancer of different parts of the stomach suggested that they had least haematinic activity when the antrum was destroyed.<sup>9</sup> On the other hand, the results with desiccated stomach from different parts of the human stomach show that the haematinic activity resides principally in the body, and its situation therefore coincides with that of the anatomical injury.<sup>10</sup> In the pig the findings appear to be the exact reverse of those in man. The most active anti-anaemic preparations are those obtained from the antrum of the stomach.<sup>11,12</sup> On the other hand, while it is not possible to produce pernicious anaemia in the pig, selective resection of the body of the stomach causes complete disappearance of the P.A. factor in its liver. If the cardia is left behind, parenteral treatment with nicotinic acid will restore the P.A. factor in the liver. This has led to the tentative hypothesis that in the pig the fundus brings about the liberation of nicotinic acid from the food and its absorption, and that this substance then, by way of the blood stream, causes the cardia, or possibly the cardia and fundus, to form the active liver principle.<sup>13</sup>

### OEESOPHAGEAL SPEECH

The use of radiotherapy for cancer of the larynx has shown consistent success only in early cases which would be suitable for laryngofissure. In the more advanced cases radiotherapy has proved an uncertain and often a disastrous remedy, so that there is a large residue of cases in which laryngectomy is the only means of securing any reliable result, the effect of irradiation in such cases being a gamble, with the odds heavily weighted against the patient. The operation itself has now a low mortality, with a convalescence that is not distressing, though many still think of the effects as produced under the conditions which prevailed at the end of the last century. It is nevertheless a mutilating operation which must be justified, because it entails the suppression of the normal voice. At first this loss was overcome by a prosthetic apparatus which supplied a sound to replace the lost phonation, and the sound conducted to the mouth by a tube was turned into articulate language by the lips, mouth, and tongue. Many patients still use this artificial larynx, which with practice enables them to talk clearly, audibly, and continuously. A telephone conversation is quite easy. It has long been known, however, that a few patients were able to produce a real voice with the pharynx and oesophagus, something much more than the indistinct vowel-less whisper yielded by attempts at articulation without any phonation.<sup>14</sup> These patients were regarded as lucky freaks of Nature, but a study of the manner in which these persons produce their voice has enabled a large proportion of those who do not acquire the trick spontaneously to be trained in voice production and to acquire a good voice without any prosthetic apparatus. An elaborate study by means of x rays was made by Prof. Burger of a man who was positively able to shout, although rather hoarsely.<sup>15</sup> It was seen in this man that air imprisoned in the stomach and lower oesophagus could be forced out at will by the diaphragm, and this belching produced a sound, which could be transformed into almost normal speech. Both the air bubble in the stomach and the air in the lower oesophagus were controlled by a pseudo-glottis formed at the upper end of the

<sup>1</sup> British Medical Journal, 1940, 1, 219.

<sup>2</sup> Jacobson, W., J. Path. Bact., 1939, 49, 1.

<sup>3</sup> Wilkinson, J. F., British Medical Journal, 1940, 1, 414.

<sup>4</sup> Ibid., 1940, 1, 415.

<sup>5</sup> Amer. J. Pathol., 1943, 19, 491.

<sup>6</sup> Acta med. scand., 1943, 115, 365.

<sup>7</sup> Schindler, R., and Ortmayer, M., Amer. J. digest. Dis., 1942, 9, 411.

<sup>8</sup> Benedict, E. B., and Mallory, T. B., Surg. Gynec. Obstet., 1943, 76, 129.

<sup>9</sup> Schenken, Stasney, and Hall, Amer. J. med. Sci., 1940, 200, 11.

<sup>10</sup> Fox, H. J., and Castle, W. B., ibid., 1942, 203, 18.

<sup>11</sup> Hennings, N., and Burgsch, H., Dtsch. med. Wschr., 1931, 57, 757.

<sup>12</sup> Meulengracht, E., Z. klin. Med., 1936, 130, 468.

<sup>13</sup> Petri, S., et al., Acta med. scand., 1944, 116, 273.

<sup>14</sup> Thomson, StClair, and Colledge, L., Cancer of the Larynx, Kegan Paul, London, 1930, p. 188.

<sup>15</sup> Burger, H., and Kaiser, L., Acta Otolaryngol., 1925, 8, 90.

oesophagus, presumably from the edges of the two inferior constrictors. The pseudo-glottis is situated at the level previously occupied by the cricoid cartilage, and can sometimes be seen with a laryngoscope as two well-defined bands which can be made to vibrate at will. In other cases these bands appear less defined than would be expected from the quality of the voice.

From a surgical point of view the opening made into the pharynx after turning forward the larynx is better closed vertically, with two short prongs to the fork at the upper end, than by a horizontal closure.<sup>16</sup> Gatewood suggests that this vertical closure may also encourage a better functional adaptation of the inferior constrictors to the formation of the pseudo-glottis.<sup>17</sup> McCall has recommended that the necessary voice training should begin several days before the operation, while the larynx is still in place, and has cited some figures to show that the voice is thus regained more quickly and more easily. However, Woods pointed out many years ago that the physical difficulty of the act of belching to order is much less after the larynx has been removed, because the cricoid cartilage is no longer in close contact with the posterior wall of the gullet, and considerable effort is needed to overcome the force with which the cricopharyngeal part of the inferior constrictor normally holds the larynx back.<sup>18</sup> It is doubtful, therefore, if anything is gained by preliminary training, but the services of an expert in voice production are invaluable after healing is complete. The details of this lie within his province, but he can be greatly assisted in his task by not allowing the patient to whisper without attempting to produce a voice. If he speaks only when he attempts to produce a voice he will much sooner acquire the habit of speaking in this unnatural way. He no longer depends for voice production upon air from the lungs but from the oesophagus; consequently the close association between speech and breathing has to be broken, and it is much harder to break this instinctive association if the patient reverts to it by whispering between the acts of pharyngeal phonation.

### REHABILITATION FILMED

"Accident Service," the second medical film produced by the British Council, was recently shown to a medical audience in London at the Curzon Cinema. The film was made at the Mansfield General Hospital and Berry Hill Hall Rehabilitation Centre, which together provide a highly effective machinery for dealing with accidents in the neighbouring coalfields. In the opening scenes the problem of accidents in highly industrialized Britain is briefly stated with the aid of diagrams, and it is shown that coal-mining is the most hazardous of industries. A miner who has been injured by a fall of rock is brought to the surface by his comrades, who are expert first-aiders. He is taken by ambulance to the hospital, where a fractured spine is diagnosed. A plaster cast is applied, and after a week in bed the miner is able to start walking in the ward. Even during this brief period in bed a planned scheme of exercise is instituted, and there is a progressive increase in the range of active movements, including occupational and recreational therapy, until, with the removal of the plaster, the miner is ready for transfer to the rehabilitation centre for the final stages of his treatment. Miners suffering from other injuries are also shown in different stages. The differences in the mechanism and treatment of a fracture and a fracture-dislocation of the spine are vividly depicted by animated diagrams. Another sequence shows the

technique of wound excision with later skin-grafting in a case of compound fracture of the tibia and fibula reduced under direct vision.

These diagrammatic and operating sequences leave little room for doubt about the part films could play in surgical teaching. "Accident Service" provides a powerful argument for the use of the film in medical education, particularly in regard to those subjects which cannot be learnt adequately from the printed or spoken word and are outside the immediate hospital experience of the student. Although the word "rehabilitation" has now won such general acceptance that it is in danger of becoming a political slogan, there are few who could give a convincing definition of it. This film, which shows in some detail the actual working of one of the pioneer rehabilitation centres, succeeds in conveying what it is so difficult to define in words. Rehabilitation is not a method of treatment but a regimen. The fundamental idea behind rehabilitation is at least as old as the Hippocratic writings. Throughout the history of Occidental Medicine there has been a recurrent struggle between the natural followers of Hippocratic Cos and those of Cnidus. Cnidians, ancient and modern, treat the organ or assail the disease. "For Coans, then and now, disease is a dissociation of functional unity of the whole organism: their therapeutics is directed towards re-establishment of functional integrity."<sup>19</sup>

Another reflection prompted by this film is that rehabilitation is limited by the quality of the primary treatment. In other words, good surgery is still indispensable. Sir Alfred Webb-Johnson, in an introductory speech, pointed out that whatever value might justly be placed upon the personal doctor-patient relationship, the film demonstrated that the injured miner must have an accident organization behind him. This impression will have been shared by most of the audience, but they will have been equally impressed by the special skill, experience, and sympathetic understanding of the mind and life of the miner that have been necessary for the creation of the rehabilitation centre depicted. Sir Alfred paid a generous tribute to Mr. E. A. Nicoll, the surgical director of the centre, and said that his work was a credit to British surgery. The additional point may be made that rehabilitation centres such as Mr. Nicoll has evolved over a period of years cannot be created overnight by official circulars, although his work and that of other pioneers in the same field have provided a splendid foundation upon which others may build.

### A MEDICAL NOBEL INSTITUTE IN SWEDEN

The Royal Caroline Institute (Kungl. Karolinska Medico-Kirurgiska Institutet), which is the medical school of Stockholm—the university (Stockholms Högskola) having no medical faculty—and is in charge of the medical Nobel Fund, has decided to build a Medical Nobel Institute for research in the three theoretical disciplines of anatomy, biochemistry, and physiology. The Institute will consist of three departments in one building to be erected in the grounds of the new medical centre at Norrbacka in the north-west region of the city. The biochemical Nobel Institute was founded in 1937 and is directed by Prof. Hugo Theorell. The physiological department will be a neurophysiological research laboratory privately endowed in 1940 for Prof. Ragnar Granit, who will also be in charge of the new institute. The anatomical department will be connected to a new chair in cytological research to be established for Dr. Torbjörn Cypersson.

<sup>16</sup> Colledge, L., in *Maingot's Postgraduate Surgery*, Medical Publications, Ltd., London, 1937, 3, 4593.

<sup>17</sup> *South med. J.*, 1943, 36, 453.

<sup>18</sup> *Arch. Otolaryngol.*, 1943, 38, 10.

<sup>19</sup> *Surg. Gynec. Obstet.*, 1922, 34, 303.

<sup>19</sup> Crookshank, F. G., in Cumston, C. G., *An Introduction to the History of Medicine*, London, 1926.

## PATHOLOGY AND THE NATIONAL HEALTH SERVICE

*A group of pathologists under the chairmanship of Prof. S. P. Bedson, F.R.S., have drawn up the statement printed below on some aspects of pathology in relation to the proposals in the White Paper.*

1. Pathology, except for a brief reference to public health bacteriology and to "laboratory service," is not mentioned in the White Paper, and we feel it is time that constructive proposals regarding the position of pathologists and the part which pathology ought to play in the new medical service should be made by practising pathologists. We have no mandate to speak for our fellows or for any administrative authority, but we have reason to believe that our views accord with those of the majority of our colleagues.

2. We believe that the closest co-ordination between the two main branches of pathology—academic and applied—is essential to a satisfactory pathological service. Nothing should be allowed to split the component parts into a number of watertight compartments.

3. Academic pathology, mainly concerned with teaching and research, will inevitably be centred in the medical departments of the universities, and will, we suppose, be fully considered in the report of the Interdepartmental Committee. It would, however, be undesirable were research and teaching to be confined to university departments and research institutions. The efficiency of laboratories chiefly concerned with routine work can be ensured only if their staffs have opportunity for independent investigations, and for benefiting by the stimulus that teaching offers. For this reason the staffing of hospital laboratories must be adequate enough to afford the pathologists time to make use of these opportunities as they arise.

4. It may prove expedient, at any rate for the time being, to place what is called public health bacteriology under a separate administration. Whilst we should regret this, we believe that the detrimental effect on pathology as a whole which such a schism would entail could be mitigated to a considerable extent if adequate co-ordination with the rest of pathology could still be maintained.

5. Clinical pathology is an important part of a general hospital service, and as such must be closely bound up with the general scheme of hospital management. But a brief consideration of the technical practices of clinical pathology and public health bacteriology shows that they are so closely related as to make division unprofitable.

6. The co-operation of the two main branches of pathology may be seriously handicapped by being administered by three different organizations—university, Ministry, and local or regional authority. The desired co-ordination of the parts into one whole, however, can be achieved primarily by the pathologists themselves, provided that the scheme of administration is such as to permit of this.

7. Within the areas of the Joint Authority as envisaged in the White Paper there should be pathological committees capable of advising the Joint Authority on all pathological matters. These committees should be representative of all the laboratories in the area, and constituted in a similar manner to those which are already working satisfactorily in some of the defence regions.

8. The university departments of pathology should retain their primary functions of teaching and research, and act as the training centres of sufficient pathologists to supply the needs of the service. The professors should act as the friends and advisers of all pathologists in their regions, and, in some cases, as national advisers on special subjects and research problems. They would take no part in the professional administration of the hospital laboratories in the regions, and while they should be closely associated with pathologists engaged in diagnostic and prophylactic work they should not themselves be responsible for it.

9. The pathologist in charge of the clinical laboratory at the university hospital should, together with appropriate members of his staff, hold university appointments and take some part in the teaching of pathology: he would not ordinarily be

responsible for the clinical pathology from outside hospitals or general practitioners. Such matters as interchange of staff between the university departments and the regional laboratories, the recognition by the university of senior pathologists in the region, and the extension of consultant and laboratory facilities to them would be a matter for detailed arrangement with each university. Several of the provincial universities have already made such arrangements.

10. The public health bacteriological service can only function as a separate administration at its main centres, and even there it must be closely associated with the universities and the larger hospital laboratories, if only to avoid uneconomic duplications of laboratories and staffs. At the periphery there must be complete fusion. A town serving an area containing less than 100,000 inhabitants cannot support more than one laboratory with reasonable economy and efficiency. In larger towns both the hospital and public health laboratories should be housed under the same roof even though under separate administration. There should also be laboratories solely devoted to public health and sufficient in number to provide for field work and epidemiological control throughout the country. In our opinion the population covered by such a laboratory would be from 3 to 4 millions. Provided that the hospital pathologist keeps the public health centre fully informed of all events appertaining to epidemic disease there is no need for any greater divorce of public health bacteriology from hospital pathology.

11. Similarly there should be a small number of laboratories specializing in medico-legal work in its criminal aspects, working in close touch with the Home Office and attached to a university. The majority of coroners' cases are not concerned with criminal action, and should be referred to senior hospital pathologists, but not to general practitioners.

12. The clinical laboratories must be situated in hospitals, under the disciplinary and financial, but not professional, administration of the owning authorities. The remarkable diversity of arrangements under which a professional man may now act as pathologist to a hospital should be brought to an end. The pathologist in charge should be of consultant rank, appointed on precisely the same terms and at the same rate of pay as his clinical colleagues, and serving with them on the medical council of the hospital.

13. Laboratory facilities must be freely at the disposal of the general practitioners in the area, but there should be no isolated small laboratories staffed only by technicians or a solitary pathologist: small laboratories should be under the surveillance of a large hospital laboratory in the vicinity which would provide the staffing. This would ensure a continuous linkage between the rural practitioner desiring pathologist assistance and the research laboratory in the university, without imposing an undue burden of technical or administrative responsibility on any single link.

14. Professional co-ordination of all laboratory services within a university region is necessary for smooth working, and experience in the Emergency Medical Service has shown that this cannot in normal times be the function of a professor or of the full-time director of a laboratory. The person responsible has to act as an intermediary between the pathologist and the administration, making it his business to see that every pathologist has all possible facilities and acting as adviser to the administration. It is a post requiring knowledge, experience, and tact, and should not be held by anyone too junior to command respect or too senior to have *lost touch with bench work*. Such an individual might well hold a part-time post in a university department, and a representative committee of the regional pathologists should properly have a voice in his or her selection. We regard a post of this sort as essential to a proper co-ordination of the service.

15. The hospital laboratories at present in existence have provided only a skeleton service for the country, and a larger number will be needed to provide for the needs of mental hospitals, fever hospitals, and sanatoria, as well as general hospitals.

16. It is in hospital pathology in particular that a free interchange of professional and technical staff is essential, both within a large region and outside it, in order to encourage

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\* *Monthly Bulletin of the Ministry of Health and the Emergency Public Health Laboratory Service, Vol. 2, October, 1943.*

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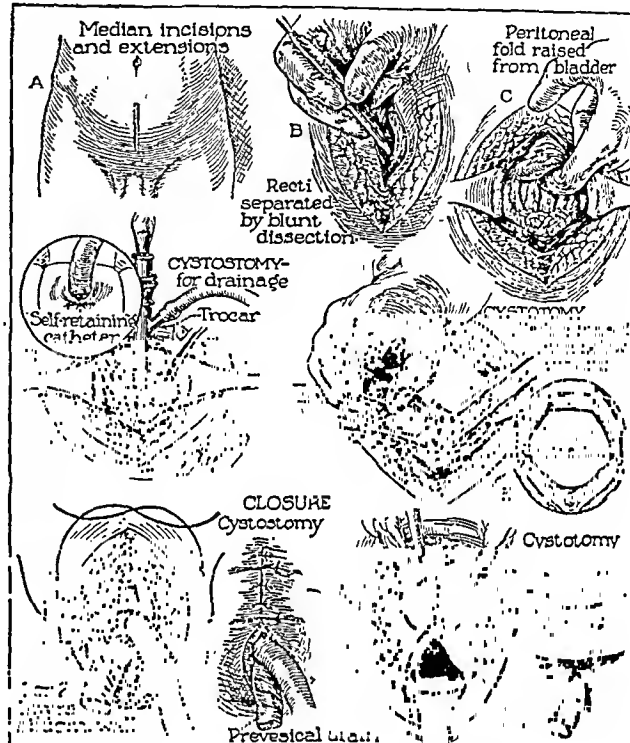
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efficiency, to prevent isolation, and provide for study leave and sickness. Local hospital administration will present financial difficulties to this interchange, which are likely to require central adjustment of a kind which has, on the whole, proved sufficiently elastic to solve similar difficulties in the Emergency Medical Service.

17. While the professional freedom of individual pathologists, as of other practitioners, must be maintained, we firmly believe that some factual, and not merely theoretical, central control of the whole service of pathology will have to be exercised if it is to be conceived as one complete section of medical service to the community. If this conception fails to be a matter of Government concern, medicine will, in this important respect, be moving backwards instead of forwards.

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A. A. MILES.

P. N. PANTON  
A. H. T. ROBB-SMITH.  
A. F. S. SLADDEN.  
JANET M. VAUGHAN

## Reports of Societies

### DISINFECTION OF AIR

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine held at the National Institute of Medical Research, Hampstead, under the presidency of Sir WELDON DALRYMPLE-CHAMPNEYS, a demonstration was given by Dr. R. B. BOURDILLON and his colleagues, Dr. O. M. Lidwell, Mr. J. E. Lovelock, and Mr. W. F. Raymond, on the study of air-borne bacteria and methods of air disinfection.

Dr. BOURDILLON explained that at the beginning of the war certain workers under Sir Patrick Laidlaw were engaged at the Institute on this study and showed that a number of methods could be used with good effect against the influenza virus. The work was afterwards taken over by Dr. C. H. Andrewes, who later turned his attention to typhus, and only a section of the former team now remained; but he hoped some useful work had been done. Four factors might be said to dominate air disinfection as seen in field trials and in actual practice. The first was the fact that while people were inclined to take an interest in the installation of any new system of air purification the interest was liable to give place to boredom and the system to fall into disuse. The second was that clinical trials were difficult, except in isolated communities, on account of the many sources of respiratory infection, so that there might be little to show for one's labours. The third was that the particles in which they were most interested, as a rule, were virus particles, and the methods available for their detection were not suitable as yet when the particles were scattered in very dilute concentrations in the air of rooms. Finally, air disinfectants were rather "messy" and troublesome, and concentration had to be carefully controlled. The whole subject must be regarded as still in the experimental stage, and it was well to start on a small scale and in places where there was a special reason for such a system. Dr. BOURDILLON placed the methods available in the following order, of preference:

- (1) Good ventilation and avoidance of overcrowding.
- (2) Daylight, whenever conditions permitted. Recent work had shown the value of daylight, even after passing through window glass, in keeping down bacteria.<sup>1</sup>
- (3) Dust control. There was accumulating evidence that dust-borne infection played a very important part.
- (4) Ultra-violet irradiation, which was to be recommended on account of its cleanliness.
- (5) Various chemical methods suitable in special cases.

#### Chemical Methods

The chemical methods included the use of hypochlorous acid gas, of propylene glycol (which had been widely studied in America and to some extent in this country), of triethylene glycol (which was effective only within a narrow range of humidity, and therefore could not be recommended for general use), of resorcinol (which was effective against freshly sprayed moist bacteria, but disappeared from the air rather rapidly, so

that in order to maintain a steady concentration it was necessary to vaporize considerable quantities), and of lactic acid, which he thought might have a future on the ground of its cheapness and the fact that it was effective over a wide range of humidity. The efficiency of all these agents for killing moist bacteria and virus particles freshly sprayed into the air from cultures or from the respiratory tract depended greatly on the relative humidity of the air. Ultra-violet light showed reduced efficiency at relative humidities of over 70%, but increased in efficiency down to at least 40% relative humidity. Propylene glycol required a humidity between 35 and 75% to be of much practical use. Resorcinol and hypochlorous acid became inefficient below 45% relative humidity, but worked well against freshly sprayed moist organisms at 60 to 70% relative humidity (and probably higher values) at normal room temperatures. Lactic acid was effective against organisms freshly sprayed in saliva at humidities from 30 to 80% or more. In concentrations suitable for daily life many of these agents were relatively inefficient against spores and the dried saprophytic organisms found in dust. Hence if Petri plates were exposed in crowded rooms the number of viable organisms collected might be little affected by these agents unless excessive concentrations were used. As most of the organisms thus found were not pathogenic, this apparent failure to kill might be misleading. Tests appeared to show that lactic acid was better than the other agents in this respect. If air disinfection was needed suddenly on a large scale to meet an epidemic or other emergency, the most practicable method was the evolution of hypochlorous acid gas by boiling a solution of bleaching powder in water with an acid phosphate. (A demonstration of this was given.) If a relatively small number of dwellings were to be disinfected, either propylene glycol or ultra-violet light was probably the safest agent, but lactic acid might be worth trial. The reduction of dust by the use of mineral oil on floors of wood or linoleum was simple and economical and seemed to be one of the most important measures now practicable on a large scale.

Air disinfection was easy in the laboratory but troublesome and expensive when used on a large scale, and therefore inferior to good ventilation when this was practicable. The chief problems were the production of adequate quantities of the bactericidal agent, its distribution in tolerably uniform concentration, the securing of suitable humidity in the air, and the high resistance of dry dust-borne organisms.

#### Discussion

In answer to a question whether there was any prospect of evolving a smaller or more compact apparatus for vaporizing lactic acid Dr. BOURDILLON said he hoped that in the future substances would be available which were easier to vaporize than lactic acid; but lactic acid could be used quite cheaply with a hand spray, and it was this he recommended for offices or small buildings. Sir LEONARD ROGERS asked whether anything could be done with the vaccinia virus. Dr. C. H. ANDREWES said it was possible to kill vaccinia in the air with small sprays. Dr. MERVYN GORDON said that vaccinia was very susceptible to permanganate of potash. This substance inhibited vaccinia and smallpox virus within half an hour. The late Andrew Balfour, when faced with a big epidemic of smallpox in the Sudan, controlled the scarring completely by saturating lint with permanganate of potash and applying it to the skin. His idea had been to kill the secondary infection, but what he really did was to inactivate the primary. Permanganate seemed to work in the same way with other viruses—that of poliomyelitis, for example.

In reply to other questions Dr. ANDREWES said that the envelope surrounding dried particles was a very great mystery. Propylene glycol seemed to be singularly inefficient when it came to organisms with dust, but it looked as if lactic acid might be more effective. Questions were asked on the ventilation of railway carriages. Dr. BOURDILLON considered that it would be better to ventilate than to use chemicals for disinfection, since the opportunities for ventilation were unlimited. Dr. J. A. H. BRINCKER asked whether ozone was discredited. Dr. BOURDILLON replied that very careful tests had recently been carried out by Dr. Elford at the Institute on that very point. Ozone was useless as an air disinfectant. In order to get an efficient killing of air-borne bacteria it would be neces-

<sup>1</sup> British Medical Journal, Feb. 19, 1944, p. 245.

sary to have a concentration of ozone which was likely to do more harm than good. He was not speaking of water-borne infection.

One of the demonstrations carried out in the course of the afternoon concerned the effect of lactic acid on air-borne bacteria in a crowded mess-room. With no method of disinfection the number of bacteria-carrying particles per cubic foot rose, on the average of a four-day experiment, during the middle period when the room became crowded, from some 15 to nearly 40, and continued at that level for half an hour, gradually subsiding to the original figure as the room emptied. When lactic acid was used, the number of particles per cubic foot, on the average of a three-day experiment, never rose higher than about 18, and dropped to 12 even while the room continued to be crowded, subsequently falling to about 5. The reduction in the number of bacteria-carrying particles due to the presence of lactic acid was estimated at 69%. The conditions during this experiment were: relative humidity, 49-75%, temperature, 16-21° C.; lactic acid concentration, 0.08-0.11 mg./c.ft. of air.

### DIETARY SURVEYS

A conference of the Nutrition Society was held on May 20 at the London School of Hygiene and Tropical Medicine, with Dr. JOHN HAMMOND, F.R.S., in the chair, for a second discussion on budgetary and dietary surveys of families and individuals. [The earlier discussion was reported in these columns on March 18, p. 401.]

#### Difficulties of Assessing Intake

Miss E. M. WIDDOWSON and Dr. R. A. McCANCE, of Cambridge, explained their methods and difficulties in conducting individual dietary surveys. They insisted that in the collection of data all food items should be weighed before being eaten, and doubted the accuracy of the "budgetary" and "questionnaire" methods. Individuals should be studied rather than families in view of the inaccuracy involved in converting data for women and children into "man values." Food consumption varied widely even in individuals of the same age and sex. Thus the individual daily food intakes of a group of 14-year-old girls lay between 1,708 and 3,736 calories. A further complication in the use of "man values" arose from the irregular variation of the intake of various nutrients with age. It was true that the protein intake increased fairly smoothly from 40 g. for boys and girls at 1 year to 80 g. for girls and 100 g. for boys at 16 years. The calcium intake, on the other hand, remained steady, because the very young, although eating less, drink relatively more milk. The vitamin C consumption might actually fall, because orange juice was given most freely in infancy. Equally formidable difficulties arose in the application of food tables to convert the data collected in terms of foodstuffs into individual nutrients. Investigators had sometimes made the grave error of taking data for uncooked foodstuffs, particularly vegetables, as applying to the cooked article. Calcium intakes could not be calculated accurately from food tables in the London area because of the high calcium content of the water supply. The iron content of foods might be greatly affected by the nature of the cooking utensils. Thus apples cut with a stainless knife and cooked in a glass vessel were found to contain 0.31 mg. of iron per 100 g., while apples cut with an ordinary knife and cooked in an iron vessel contained 6.0 mg. per 100 g.

Prof. V. H. MOTTRAM suggested that in view of the serious criticisms raised by the previous speakers against both the indirect calculation of calorie requirements and the use of "man values," it might be necessary to revert to the calorimeter. Although this instrument was expensive and laborious in use, it might be better to face these objections rather than take quick methods which gave wrong results. Dr. F. C. HAPFOLD reported a survey among students in Leeds, in which mean calorie intakes of 2,609 and 2,640 were found on different occasions. Mr. A. L. BACHARACH emphasized the danger of confusing consumption with requirement. The mere fact that children were given a certain allowance of milk did not imply that they needed it.

#### "Science" of Cooking Vegetables

Dr. GERTRUDE WAGNER, of the Wartime Social Survey, described her extensive investigation into the methods used by housewives throughout the country in cooking vegetables.

### DIETARY SURVEYS

The effect of the methods most commonly used on the destruction of vitamin C was studied at the Dunn Nutrition Laboratory, Cambridge. To avoid loss of vitamin it was important not to have too much cooking water, not to cook too long, and to eat the vegetables soon after they were cooked. Mrs. B. CALLOW pointed out that whereas in America the abundance of citrus fruits left only 50% of the vitamin C requirement to be derived from vegetables, in this country vegetables must provide 80% of our requirement. There was room for improvement in cooking vegetables.

Dr. G. N. JENKINS, Dr. L. W. MAPSON, and Miss M. OLLIVER described the chemical methods they had worked out for the estimation of nutrients in meals collected at canteens in the Cambridge area. The importance of adequate sampling was emphasized, and as a demonstration a complete meal was homogenized in a Waring blender in a matter of seconds. The agreement between values found by analysis and calculated from tables was generally fairly good. Dr. C. P. STEWART, of Edinburgh, considered that chemical analysis was not usually necessary, calculations based on tables being accurate enough for most purposes. He gave, however, a striking example of the loss of vitamin C in the preparation of vegetables for hospital patients. The raw vegetables contained 14-41 mg. per 100 g., when freshly cooked 10-38 mg., and when finally reaching the wards only 0.7-3.6 mg.

#### Success of School Meals

Miss E. M. LANGLEY outlined the activities of the Board of Education in supplying meals for school-children. She recounted how the first steps had been due to charity. Thus in 1862 Victor Hugo supplied forty poor children in Guernsey with meat and wine. Official action might be dated from the Provision of Meals Act in 1906. The dinners then provided were a monotonous repetition of soup or hash, bread, and rice pudding, and cost about 1d. The meals now served in elementary schools were designed to supply about 1,000 of the child's daily requirement of 2,500 calories, and on an average contained 20-25 g. of protein, 30 g. of fat, 2,450 i.u. of vitamin A, 230 i.u. of vitamin B<sub>1</sub>, 54 mg. of vitamin C, 5.7 mg. of iron, and 425 mg. of calcium. One ounce of dried milk was allowed for every meal, which supplied about half the protein requirement. Sliced raw vegetables were given with "conveyed" meals to make good the deficiency in vitamin C. The meals usually cost about 5d., and were varied and attractive. The "Oslo dinner" of milk, brown bread, cheese, salad, and an orange was popular with children, but took a long time to eat. About 1,500,000 children were now fed at school, as compared with 250,000 before the war.

Dr. M. PYKE, of the Ministry of Food, spoke of the food provided by industrial canteens. The total daily intakes at work and at home for various classes of operative were estimated by questioning individuals as to their consumption over the last 24 hours, portions of food of known size being displayed for purposes of comparison when necessary. It was found that as many as six meals a day might be taken when snacks of 200 calories or over were included. For Lancashire women cotton operatives the daily intake was 2,460 calories and for male "mule" spinners 4,030 calories. A typical mid-workers usually took only 630 calories, which was, however, more than the 510 calories they got at home. The proportion of the daily requirement eaten in the canteen depended on the times of shift. Men "knocking off" at 3 p.m. ate only 35% of their daily intake in the canteen, as compared with 55% for men who finished work at 5.30 p.m. More food was eaten in two sandwich meals taken during the shift than in one hot conventional meal with meat and potatoes. Coal-miners did not appreciate a hot meal served at the coal face. Habit might have a big effect on food consumption. Thus much less cheese was eaten by miners in Lancashire and Durham than in other districts.

#### Diet of the Hospital Patient

Dr. A. LYALL reported a survey of hospital diets in Aberdeen. His method was to take an inventory of the food in selected wards. In a general hospital with 500 beds the food officially provided supplied on an average 1,680 calories, being made up of 65 g. of protein, 70 g. of fat, and 183 g. of carbohydrate daily. Food was brought in privately for the patients

to the average extent of 502 calories, making the total daily intake 2,220 calories, which was nearly identical with the estimate of 2,100 calories for the population in general. It was obvious that in the absence of private food supplies the patients would be underfed. In a maternity home the intake was 2,200 calories without private extras, and 2,540 calories with extras. Adequate feeding was essential during confinement, although overfeeding might cause obesity, particularly in multiparae. Good food in a maternity home was desirable, not only for its immediate effect, but for its educational value. In a hospital for chronic diseases the total intake was 2,130 calories.

Miss M. C. BROATCH, of the King Edward's Hospital Fund, suggested that frequent small meals might be better than fewer large meals. In school the time taken over the "Oslo dinner" had the advantage of resting the children. The goal of 1,000 calories for a school dinner seemed to be set too high, and could be reached only by the frequent inclusion of suet puddings. In hospitals monotony must be necessary. Equipment for food buyers and trained cooks were necessary. In all the foodstuffs to which they were entitled. Hospital patients should receive 120 g. of protein daily, including 78 g. of animal protein. In one hospital no bacon, eggs, or butter were purchased. While he would not accuse those responsible of dishonesty, there was obvious room for improvement. The danger of vitamin C deficiency was slight: he had not found a single case of scurvy in 15,000 subjects examined. Dr. G. GRAHAM, of St. Bartholomew's Hospital, however, reported his recent observation of seven cases of scurvy and of hyperkeratosis of the hair follicles. He stressed the importance of vitamin C in wound healing. Prof. J. R. MARRACK spoke of the loss of appetite in workers when changed to night shift, and Miss M. ANDROSS of the inconvenience of large meals to workers operating under cramped conditions.

The last speaker was Prof. MAYNARD, of Cornell University, U.S.A., who expressed his pleasure that his official mission to this country had afforded him an opportunity to be present at the meeting and also to "look in" on the experiment on human vitamin A requirements which was being undertaken by an M.R.C. subcommittee at Sheffield. There was urgent need to convert data on food supplies and requirements into common terms that could be understood in all countries. The National daily requirement of vitamin A was estimated by the Research Council of the U.S.A. as 5,000 i.u. This was intended to apply to a mixture of "preformed" vitamin A and carotene in the proportion in which they were present in most diets, not, as was sometimes assumed in this country, to either vitamin A or carotene considered separately. There was an unfortunate tendency for lease-lend foods to change their nutritional value at least on paper, merely by crossing the nutrition expert to co-ordinate their ideas and link up their terminology, so that food production might be harmonized with food requirements.

#### CONFERENCE OF PHYSIOLOGISTS IN MOSCOW

When Pavlov was still alive his pupils and fellow-workers would meet regularly at his flat, where in an atmosphere of friendliness they would discuss current work, difficult problems, achievements, new theories, and experiments. After the death of the great Russian physiologist the tradition was continued, but no longer in the teacher's home. In large halls Soviet physiologists hold conferences on physiological problems and discuss the heritage of the scientist and his discoveries and achievements in those branches of physiology in which he did pioneer work. The ninth conference was held in 1941; the tenth opened in Moscow on March 29, 1944. In his opening address Academician Orbeli, vice-president of the Academy of Sciences and chairman of the conference, pointed out that these memorial conferences had been in abeyance on account of the war. It had become urgently necessary to evacuate laboratories into the interior. "But," he added, "there is no power on

earth that can stop the onward march of the scientific thought of the Soviet people." In spite of wartime difficulties, research, far from diminishing in scope, has gone ahead into new channels. The war has created new conditions, and scientists are making full use of them. Theoretical physiology is being widely applied to problems of war medicine. The physiological causes of higher nervous activity established by Pavlov have made it possible for his pupils and research works to develop new methods for every variety of wartime trauma. Pavlov himself carried out his experiments chiefly on dogs, but now in wartime the majority of physiologists are making a study of man himself, healthy and sick, chiefly of the effects of war injuries—a study which permits of a more accurate understanding of the mechanism of higher nervous activity and offers a possibility of rendering better aid in healing the wounded.

Fifty papers were read at the conference, seventeen of them devoted to clinical physiological investigations into the effects of wartime trauma and the development of methods for their treatment. Further experimental work in the study of higher nervous activity, problems of the chemical regulation of the nervous system, the physiology and pathology of the sense organs, organism, and the physiology of the sense organs. The first paper was entitled: "New Material concerning the Genesis of Old Age, and Measures for Preventing Premature Senility," written by Maria Petrova, a very close assistant of Pavlov, who spoke of her as quite the most valued and outstanding of his fellow-workers. Petrova remained in Leningrad during the whole of the siege, in spite of her advanced age—she was 70 in April. In Leningrad, or sometimes in the suburb of Koltushy, she continued her experiments on neuroses in dogs. Her paper gave the results of parts of this work. She concluded with these words: "To slow down the process of ageing is possible by intelligent management of one's life. The first principle of this intelligent management is work."

## Correspondence

### Work of M.R.C. Committees

SIR.—Dr. J. M. Alston's letter in your issue of May 27 about the work of committees of the Medical Research Council touches on important questions about which I may perhaps usefully make some factual comments.

The Council do not themselves claim any higher authority for the opinions of their expert committees than that stated by Dr. Alston. In science there can be no official brand of truth, and seldom any finality of judgment. Nevertheless, when it is necessary to take a decision in practical affairs this must be based on what is considered to be the best advice available at the time, although it should be realized that such advice is open to criticism by other competent and informed persons and is subject to review in the light of further knowledge.

The Council would likewise agree with Dr. Alston that their efforts in promoting and co-ordinating research are complementary to independent endeavours and work assisted from other sources. They are certainly far from wishing to exercise any restrictive function, although they must necessarily discriminate when deciding which projects should receive their positive support.

Dr. Alston is of course right in saying that new drugs were tested and evaluated before the Council set up special machinery for the purpose, but some reservations must be made. Before such machinery existed there was frequently real difficulty in securing adequate clinical trial of new remedies, especially those emanating from commercial laboratories, and in other cases the release of new remedies without any organized preliminary test had undesirable consequences. Dr. Alston is unfortunate, moreover, in his three examples of remedies alleged to have been tried without the aid of official machinery. The Medical Research Council were solely responsible for the first trials—and indeed the first production—both of insulin and of liver extract in this country. The Council also arranged clinical trials of concentrated antipneumococcal serum sent to them from America for their scheme. It is true that all these trials, except the later ones on pneumonia, were made before the Council had appointed a standing Therapeutic Trials Committee to assist them in the matter, but the machinery was not otherwise different.—I am, etc.,

EDWARD MELLANBY.

Medical Research Council.

### Aerial Convection from Smallpox Hospitals.

SIR,—The article by Dr. Killick Millard (May 6, p. 628) and the letter from Prof. Picken (May 20, p. 699) raise again the difficult question of the aerial transmission of smallpox. In the 1920 Glasgow epidemic, to which Prof. Picken refers, I was unable to assure myself, after consideration of all the relevant facts, to what extent the smallpox hospital, which was then a part of Belvidere Fever Hospital, influenced the incidence round it, and concluded that the problem was left undetermined. In the latter part of the epidemic Robroyston Hospital, in a reasonably isolated situation, admitted smallpox patients, and cases did occur within a mile or two of it. But here again, as Prof. Picken says, it was impossible to exclude other possible sources.

It seemed to me that the first step to be taken was to prevent any possibility of spread from the hospital by members of the staff. Accordingly, it was arranged that the staff, including nurses, maids, and porters, should be recruited from volunteers who would undertake to live continuously in the hospital without the routine outside hours off duty, that their salaries would be increased by 50%, and that they would receive a reasonable holiday after the outbreak terminated or at intervals preceded by careful personal disinfection. This system has worked well. Since it was adopted odd cases of smallpox have been admitted, including the small outbreak in the city two years ago. Although it has not been tested out in a major outbreak, nevertheless it has given a sense of security, and I do not know of any instance where spread from the hospital, directly or indirectly, could be alleged.—I am, etc.,

Public Health Department, Glasgow

A. S. M. MACGREGOR.

SIR,—Dr. Killick Millard's communication is assuredly of practical importance, for, as he says, if aerial convection can be absolved of any notable influence in the spread of smallpox public authorities will be spared much expense and their medical officers great inconvenience.

I cannot, however, think that he has been happy in selecting the Purfleet epidemic of 1901-2 as his main proof of aerial convection. Obviously if Dr. Buchanan in 1904 had to admit that even one man from the hospital ships had visited his sweetheart at Purfleet this completely invalidates the statement in his report, presumably written before this painful discovery, that "in the Purfleet epidemic we have to choose between aerial convection or nothing; there is here no question of infection, direct or mediate, through human intercourse or traffic." And, the bottom being thus knocked out of Dr. Buchanan's report, away goes the striking support that, in Dr. Killick Millard's opinion, it gives to the theory of aerial convection.

At this point I was moved to take down *Infectious Diseases*, by my old teacher and chief, that same Dr. C. B. Ker who opened the debate against aerial convection at the Epidemiological Society's meeting in 1904 mentioned by Dr. Millard, and I turned to the section on smallpox hospitals and aerial convection on page 195. The whole of it should be read, but permit me to quote some sentences which seem to be very pertinent. "What is to be the situation of the smallpox hospital? In an adequately revaccinated community this is absolutely immaterial. In Germany the very existence of such buildings is unnecessary, and stray cases of the disease are nursed in general hospitals with no ill effects." He notes that "hospital influence" is generally recognized, and gives the two theories—aerial convection and human contacts—that are held to account for this influence.

"That infection can, under certain circumstances, be carried by air it would be unreasonable to doubt. . . . It must be remembered, however, that there are more ways of leakage of infection from a smallpox hospital than by air. . . . When the Edinburgh Smallpox Hospital was in the centre of the city it was necessary, not so many years ago, to have practically a cordon of police round its walls to prevent the outside public deliberately coming into contact with the patients. And as regards a certain hospital in England, the M.O.H. found that young men from outside were carrying on illicit amours, not only with the wardmaids, but actually with girls convalescing from smallpox, and that within the hospital precincts. It is said that nowadays such breaches of discipline are impossible. It

is certainly to be hoped so, but who can answer for every member of his staff?"

And after briefly recording the Edinburgh outbreak (given in greater detail by Dr. Millard in his account of the epidemiological debate), he concludes, "It is a somewhat melancholy reflection that it is only the extraordinary attitude of this country towards vaccination which renders this discussion of smallpox hospitals necessary. The whole question should be merely academic. As it is, it is unfortunately most practical." Claude Ker, as all who knew him will agree, was a man of immense sanity and rich in the uncommon virtue of common sense.

One other consideration occurs to me. Human nature is infinitely variable and the possibilities of human contacts multitudinous. Aerial convection should have no variables except the wind. If for three months the Edinburgh City Hospital could have an average of fifty smallpox patients without any evidence of infection having spread from the hospital, and this under local conditions that in England would have been illegal, is not this "negative evidence" very positive evidence indeed?

Few, I suppose, would deny the possibility of aerial convection. The problems are what is its effective range and what is its importance as compared with direct human contacts. It is, as Dr. Killick Millard says, a matter of weighing the evidence; but while sympathizing with his desire to put the matter to the test I share the dislike of Dr. Harries that the *corpora vilia* of the experiment should be the general population of a fever hospital not all protected by recent efficient vaccination. A possible, though, I admit, an unlikely, method of investigation would be in any future epidemic to surround smallpox hospitals with hutments at increasing distances from the hospital as centre, and radiating to the four cardinal points (this to test the influence of the prevailing winds); each hutment to be in a compound surrounded by barbed wire entanglements, and to be occupied by a volunteer corps of adult unvaccinated conscientious objectors.—I am, etc.,

Barrow-in-Furness.

JOHN WARE.

SIR,—I think Dr. Killick Millard's views on the aerial convection of smallpox merit serious consideration by those concerned with public health teaching and practice. The evidence against this possible mode of transmission of smallpox has always lacked complete proof. If the causative organisms of enteric and dysenteric infections can be disseminated in pulverized faeces at long range during military campaigns, why should not the virus of variola, which is known to exist in the desiccated crusts of smallpox lesions, be similarly dispersed? I at any rate intend to continue telling my students about the possibility of this officially unorthodox mode of transmission until absolute proof of its invalidity is forthcoming.—I am, etc.,

Cork Street Fever Hospital, Dublin.

CHRIS. J. MCSWEENEY.

### Types of Diphtheria Infection

SIR,—I read with interest your annotation on misleading names in reference to *C. diphtheriae* (May 6, p. 626), and in view of the interest that this subject has for those engaged in clinical fever work I here give figures not previously published of cases of diphtheria typed by me at Knightswood Hospital, Glasgow, between Oct., 1934, and June, 1936, while acting as senior assistant to Dr. W. Dow, the then medical superintendent.

It was noted at Knightswood Hospital that the death rate for diphtheria, which had been 4.3% in 1933, had altered during the first part of 1934 to 8.2%, and that a more severe type of case was being admitted. It was decided, therefore, to type all cases of clinical diphtheria admitted, and to correlate these types with morbidity and mortality. The following were the results obtained:

Total Number of Cases—414

Type	No. of Cases	Deaths		Cardiac Complications		Paralysis	
		No.	%	No.	%	No.	%
Gravis	129	16	12.4	18	14	25	19.3
Intermediate	203	3	1.4	17	8.1	11	5
Mitis	57	—	—	—	—	1	1.7

(Also 15 atypical strain, 5 mixed. No complications or deaths.)



Classification of cases as regards severity, using the total amounts of serum given as an arbitrary measure, gave the following results:

Severity	Gravis	Intermediate	Mitis
Marked .. ..	33	8	12
Moderate .. ..	27	31	30
Mild .. ..	40	61	58

(Mild, 0-24,000 units. Moderate, 24,000-40,000 units. Marked, 40,000 units and over.)

From the above tables it will be noted that in this series the terms gravis, intermedius, and mitis did fit into the clinical picture, although in mitis infections there was a tendency to overtreat in comparison with the other two groups, bearing out what I have since noted, that in mitis infections the local condition is often out of proportion to the general toxæmia.

In respect of gravis cases it was noted that certain strains did not produce a severe infection, and that these strains were slow in producing the typical sugar and other reactions, including haemolysis, and it was therefore thought that there was perhaps some relationship between the severity of a diphtheritic infection and the causal organism's haemolytic power. In an attempt to correlate these, several strains were tested for haemolytic power, using 5% suspension of human, sheep, guinea-pig, rabbit, ox, and horse corpuscles, also poured plates incorporating these bloods (guinea-pig omitted). Briefly, the conclusions come to were that intermedius strains were non-haemolytic for all corpuscles, that mitis was haemolytic, except for sheep's corpuscles and, in certain instances, ox corpuscles, while gravis could be divided into haemolytic and non-haemolytic strains, the former varying in their ability to cause haemolysis according to the corpuscles used. Gravis organisms, however, isolated from severe infections invariably caused haemolysis of human, rabbit, guinea-pig, and horse corpuscles, and certain of these also caused haemolysis of ox and sheep corpuscles when incorporated in poured plates.

These haemolytic strains appeared to be more virulent for mice than non-haemolytic strains, and the average amount of serum given in such infections was 43,000 units, as against 23,000 for non-haemolytic strains, leaving the impression that the haemolytic power of gravis strains is related in some way to virulence. It would be interesting to know the relationship, if any, between the haemolytic capabilities of gravis strains and their component B production as postulated by O'Meara (*J. Path. Bact.*, 1940, 51, No. 3, 317).

As regards the response of gravis infections to ordinary anti-toxin, one usually found (depending upon the day of illness) that the general toxæmia could be controlled by large doses of intravenous serum, although the local condition might progress for several days after the commencement of treatment. In recent cases one has found that adequate dosage has had to be as high as a total of 500,000 units, given over a period of several days.—I am, etc.,

J. LANDESS HORNE.  
Medical Superintendent

County I.D. Hospital, Strathpeffer.

### Increase in Diarrhoeal Diseases

SIR.—The scourge of infantile diarrhoea, still prevalent in London in the early years of the present century, has been vastly diminished until these war years, campaigns against dirt, "kill that fly," etc., obviously having helped. More recent illustrations of dangers of fly-borne infections come from: (1) a cavalry camp where flies swarmed, and dysentery cases were 30 a day, rapidly reduced to nil by a medical officer who had flies slaughtered; (2) districts where so-called summer sickness prevails—i.e., almost universal mild or severe gastro-enteritis—always worse where hot dry weather and neglect bring swarms of house flies. The few households that escape infection are scrupulously free from fly contact. Culture plates exposed to house flies and incubated gave such illuminating results that local doctors now say, "Yes, fly sickness," when called to "summer sickness" cases, hoping thereby to impress the need for "kill that fly."

Successful breast-feeding is the and the greatest safeguard from infection. Infants should never be weaned in the hottest

summer months. In the severe winter epidemic of infantile enteritis in London a few years ago one home had 11 babies: 4 completely breast-fed escaped infection; 7 on part or whole artificial feeding were infected and 4 of them died.

More widespread successful breast-feeding will be attained when common-sense principles—such as are applied in good dairy farms—are followed. A cow must not be chased round a field all day; must be given enough proper food and abundant water, and must be milked regularly and above all completely. So long as mothers are taught in maternity homes and hospitals to give "10 minutes each side" instead of to make "baby strip first breast before changing to second," so long will many successfully "dry themselves off" in a few weeks. Cows are specially treated to yield quality and quantity at the lowest cost; apply similar principles to human breasts for improved results to both mother and baby.—I am, etc.,

London, W.I.

D. C. LOGAN.

### Osteo-arthritis after Carpal Scaphoid Fracture

SIR.—It appears from the article by Robertson and Wilkins on fracture of the carpal scaphoid, in your issue of May 20 (p. 685), that following non-union a large proportion of the cases, eighteen in all, developed varying degrees of osteo-arthritis, whereas three more were able to return to duty with no signs of arthritic changes. Why this difference? It suggests something in the individuals concerned rather than in the injury itself. Two hypotheses suggest themselves: the first, that a focus of infection was present in the individuals developing arthritis and not in the three who escaped. This explanation will not appeal to those who regard osteo-arthritis as having no infective factor. The second, that the state of the cartilage determined the issue. Some people seem to possess, perhaps by inheritance, a vulnerable form of cartilage, others not so. Subpatellar erosion is easily demonstrable and occurs in all cases of osteo-arthritis, whether the knee-joints are involved or not. It is never found in typical rheumatoid arthritis.

McCombie Young (1939) found that 10% of all recruits showed subpatellar erosion. If vulnerable cartilage and a focus of infection were present this might account for the three severe cases of osteo-arthritis described.

It would be a valuable observation were a note to be made in all cases of carpal fracture of the presence or absence of patellar crepitus and of any obvious focus of infection in the teeth, posterior nares, or throat.—I am, etc.,

London, W.I.

H. WARREN CROWE.

### Man's Essential Dilemma

SIR.—Your welcome notice of my *Conscience and Society* (May 20, p. 691) brings out a number of points in this book which other reviews have missed or elided. May I comment on three of these?

I do hold most firmly that Freud's major errors (whether of fact or of stress) are attributable to his own "obsessive" character, and, further, that it is to "aggressive-obsessional" characters that we owe that emotional leadership which drives us to war. But I also hold and emphasize that modern war would probably not occur if obsessional methods of thinking and feeling did not ultimately spread to normal men and women.

That is hardly a "narrow" conclusion. My doctrine of the universality of human prejudice and our human tendency to fall into obsessional ways of thought under stress of emotion willingly admits the political bias at once of the author and of the reviewer of this book. But no argument of mine would make "all belligerents equally guilty," any more than belief in the universality of human selfishness makes two litigants equally guilty in the eyes of a judge. Between nations, however, the trouble is to find the judge and secure the judgment. That search and attainment are among the main concerns of *Conscience and Society*.

The quotation from my concluding tract for the times: "Ten years after this present war has ceased it will no more matter who 'caused' or who 'won' it than it did ten years after the last one" requires careful reading and also the context: "Politically, mankind will be crushed and burdened

by the problems of an aftermath. Individually, men will have forgotten all but the empty seats at table, the pensions, and occasional fireside memories. What matters about a war to the men and women concerned is the starting, the waging, and the stopping of it. Those and not the 'issues involved' are the realities of our present life." Perhaps that will all read less "curiously" in ten years' time.—I am, etc.,

RANYARD WEST.

### Status of M.R.C.P.s

SIR,—The Royal College of Physicians of London has recently published a report on medical education, and I desire to point out an anomaly and what I believe to be a disadvantage in the work of the College. Members play no part. Members, who hold a high and valuable diploma, have never held a statutory position in their College. I believe it is high time that members should be given a better position in the Royal College of Physicians and a share in its government. They could, if allowed, contribute substantial and valuable material to the work of the College. There are almost exactly a thousand members of over ten years' standing, but all are rigidly excluded from any share in the activities of the College, and under the existing constitution the great majority are permanently excluded.—I am, etc.,

Peterborough.

G. F. WALKER.

### Medical Education: Principles and Method

SIR,—One of the more amusing aspects about the present discussions on medical education is the disgusted contempt with which the teachers seem to regard the average student. It would appear that he is an ignorant, uncultured fellow, hardly fit to be received in educated society, and certainly in no state to profit from the pearls of wisdom which fall from the lips of the teachers. Boys, one expects them to say, were very different in their young days. It rather looks as if science has displaced the unfortunate classics in yet another way; instead of: "Why! the boy can't even compose a decent hexameter!" it is now, "Good heavens! the young nincompoop has no conception of modern philosophical theory!"

Dr. Walshe complains that he has yet to meet a student "who has a clear idea of what is meant by a natural law or how it is defined, and who realizes that all science comes from the meeting of the observational and conceptual orders of experience, . . ." I can well believe it. I doubt whether even Dr. Walshe talked like that at the age of 18 or 20. At that age a boy is learning how to *do* things, not how to talk about them in high-sounding phrases. It is reality he is after, not abstractions; those will come later of themselves if he is of that turn of mind; if he is not, I do not think anything will make him so.

It would, of course, be quite easy to produce students who could recite stuff about conceptual orders of experience *ad lib*. Very nice, too, and most useful training for a philosophical lectureship; but not really of much guidance when it comes to Mrs. So-and-so's urgent post-partum haemorrhage, which is the sort of problem the students are really being trained to tackle. What we must bring ourselves to realize, painful though it may be, is that the great majority of medical students are apprentices to a craft; as G.P.s they will be craftsmen whose job, as Sir Thomas Lewis has pointed out, is to apply what they have been taught according to established principles, not experiment and theorize. You do not expect the man who drives your car to be familiar with Fourier's "Theory of Heat"; you expect him to listen to the engine and tell you whether that funny noise is really a "big-end" gone or just imagination. You do not even expect him to know much about the "general principles of scientific thought." You do hope he is intimately acquainted with the ailments of motor cars and how to cure them.

It may be argued that this is too narrow a view; that even the motor mechanic would be all the better if he were a bit of a scientist as well; as well—not instead. But art is long and life is short. When a practical job has to be done the "how-to-do-it" knowledge is what counts. The reason why, and the reason behind that, and so on in an infinite series, are no help, except in so far as the first few terms may serve as aids to memory. Unfortunately, medicine consists largely of

unrelated facts, and so long as that remains true students will just have to commit these facts to memory as best they can.

Not that I have any wish to belittle science or even its more abstract principles. But I suggest there is some danger of over-estimating their importance in practical medicine. It is apparently possible to be a very efficient doctor with only the crudest notions of elementary physics, for example. I remember a student being asked by an eminent honorary why the mediastinum moves over towards a collapsed lung. The student thought it was due to a pressure difference: the pressure on the sound side pushed it over. "Pressure?" said the honorary. "Pressure has nothing to do with it; it's pulled over by suction!" There was no "come-back" to that one, of course, and the teacher moved serenely on to the next bed, followed by the admiring crowd of students, who would cheerfully have said it was pulled over by the moon if they thought that was what a potential examiner wanted them to say. Quite right too; only a research worker wants to know why; sufficient for the practical man that it is so.

There is another objection to the attempt to teach principles before practice (or another aspect of the objection), and that is that the human mind does not work that way—at least, not if it can help it. You do not try to teach a child the philosophical principles of mathematics before teaching it to add and subtract, although in logic they come first. The results would be sadly disappointing if you did. The facts must be demonstrated and the techniques learnt first; philosophizing comes later. That is what I meant by saying that the pre-clinical student is still learning to *do* things: he is still learning (and re-learning) how to measure, and weigh; and precipitate, and connect batteries to induction coils (lots of them can't do that), and a host of other strange things which in after-years will become second nature. He might be expected to infer something of scientific method from all this, and so, I think, he does, according to his lights and interests. A really good teacher could help him to infer more, but teachers as good as that are born, not made.

The point I am trying to make is that the vision of graduates issuing forth from their medical school equipped with a mature scientific philosophy, not to mention an ability to behave with common sense on all occasions, is a Utopian dream. The real scientific mind is a rarity, and it starts to be one in early childhood. If you spot one, just encourage it and give it scope; it will teach itself. Moreover, if you give it half a chance it will not go into general practice. But the ordinary people, who are going to make ordinary efficient medical craftsmen in time, must be taught their trade by means appropriate to the object they have in view.—I am, etc.,

Brancepeth, Co. Durham.

W. E. HICK.

SIR,—Dr. Walshe seems rather exacting. Why should a clinical clerk know what is meant by "the structure of experience"? The Church implants real grace in the young not by teaching theology but by using perceptual myths. "For effective teaching there must be the disk of really apprehended dogma; rays diversely reflected and refracted from clouded sources will not do." To know "the direction in which to look for light", the student must memorize facts, must be taught to perceive, must do routine techniques, and must be given a framework of crude "Platonic" concepts—such as the textbook diseases and concepts implied by a method of case-taking—to act as his "organs of interpretation" akin to his organs of sense. If at first he imagines given symbols to be adequate reality-references he can be undeceived later.

Minds capable of continued reflection are a minority; the majority want definite snippets of experience. Also generalization of process-likeness is a talent not always found in the man who is apt to discriminate differences in percepts. Often what delights the synthesizing philosophic mind fatigues and irritates the analytic technique-loving mind; often it exasperates the philosopher when the analytic mind confidently applies to a whole his logical deductions from an abstracted past. A doctor who considers all statistical results and all pharmacological tests superior to clinical judgments is no wiser than the man who yells "Equal pay for equal work" and forgets to add "by equal people."

A good teacher saves a student much labour, but students should rightly learn many more facts than they need in practice

routine. It is the physiology that a man has forgotten that enables him to read, e.g., Burridge and Adrian, with some ease, understanding, and profit.—I am, etc.,

Greenford.

W. THOMSON BROWN.

SIR.—Dr. Walshe (May 27, p. 728) rightly emphasizes the necessity for teaching the medical student the principles involved in scientific thought and method. It would be a great help to the development of the student's intellectual powers if he were also taught that these principles could be applied to other problems in life besides medicine. Doctors are too often swayed by emotion rather than guided by reason when discussing non-medical subjects.

Another much-needed reform is the appointment of a general practitioner to the staff of every teaching hospital, for most of the students take up general practice after they have qualified. The idea of a G.P. let loose among students who are being carefully nursed along academic lines appals the average teaching consultant, but there could be no harm in having a G.P. present at a medical round once a week to add to the discussion of the cases.—I am, etc.,

London, W.5.

H. STEPHEN PASMORE.

### Medical Certificates for Special Rations

SIR.—It is with appreciation and relief I see the signs of a small revolution by the Guildford Practitioners' Group (May 20, p. 701) regarding medical certificates for special rations. May I also add my little voice and hope that other practitioners and branches of the B.M.A. will take this matter up.

My main complaint, and it is made with considerable feeling, is the issuing of the following certificates for extra milk and eggs for active tuberculosis of all types and for gastric, duodenal, and anastomotic ulcers. Now, Sir, whether the war lasts another week or another generation these people will still have their gastric ulcers and active tuberculosis, and I fail to see why we should be compelled by the Ministry of Food to issue continuous certificates every three months or less for these patients. Even if their ulcers cause them no more pain, with the present difficulty in getting milk the patients will always ask for their milk certificate, and the doctor must therefore give it to them.

There is also another point against which I should like to see the medical profession protest, and that is the Board of Trade's request for certificates for corsets and brassières. Under present emergency conditions I have no objection, and I am sure that members of the medical profession will agree with me, to the initial certificate requesting the manufacture of the article required. What I do object to is that my obese, viscerotropic, and post-maternity patients, etc., should stand up in front of me while I gaze upon their garment and see whether it fits. I am no corset or brassière expert: I do not know a doctor who is; and, furthermore, if the garment does not fit, then who knows better than the patient? Over the last six months I have refused to sign any certificates stating that the particular garment is to my satisfaction for the complaint for which it is issued. The manufacturers concerned are persistently writing or phoning me, and I am at present awaiting a call from a representative of the Board of Trade.

I feel that the only way in which we can stop this unnecessary waste of time and paper is for individual Branches to make the complaint, and I am sure that if there are enough complaints the B.M.A. will have to do something.—I am, etc.,

Rugby.

T. E. WAINE.

### The Colonial Medical Service

SIR.—To Sir Philip Manson-Bahr's tribute (May 27, p. 732) to the work of members of the Colonial Medical Service, which I heartily endorse, I could add more. But I will only mention two other examples: one that of Dr. J. W. Field, Chief Malaria Officer at the Institute for Medical Research of Malaya (with whom I had the honour to work); and the other that of Dr. Gordon Ryrie, Superintendent of the Leper Settlement at Sungei Buloh, F.M.S. In 1937 Dr. Field refused promotion rather than discontinue his work on the chemoprophylaxis of malaria. Dr. Ryrie's work for the lepers brought out whatever latent happiness a leper colony could enjoy, and

brought such satisfaction to himself that in 1941-2 he preferred to remain under the Japanese invaders rather than escape and leave the colony.

If those diehards of the medical profession who consider that the fee is the only or the main incentive to good work could once free themselves from their chains, perhaps they too would find such satisfaction in their work itself that memories of the "money incentive" would become as a bad dream that is passed.—I am, etc.,

London, W.1.

COLUMBA GUEST.

SIR.—From time to time you print an advertisement for medical officers for the Colonial Medical Service. May I draw attention to two statements in it which are misleading: (1) "There are ample opportunities for work in medical research." (2) "There are large numbers of super-scale posts to which promotion is on merit." Any chance of work in medical research is eliminated by a reduced staff and enormously increased routine clinical pathology and medico-legal work. Promotion is usually on seniority; probably rightly so, as it at least eliminates any sense of favouritism.

I do not wish to put men off the Colonial Medical Service. I think it is good. But I feel they should not apply for a post on the strength of an ingeniously worded advertisement.—I am, etc.,

R. D. REID,  
Pathologist, Gold Coast

## Obituary

SIR CUTHBERT WALLACE, Bt., K.C.M.G., C.B.

Former President, Royal College of Surgeons

Sir Cuthbert Wallace, who died on May 24, served his profession in many high offices, and will be remembered with warm regard and admiration by his colleagues and a host of former pupils.

Cuthbert Sidney Wallace was born in 1869 at Surbiton, Surrey, the son of the Rev. John Wallace. He was educated at Haileybury College, a school in which he continued to take the greatest interest throughout his life, serving for many years on its Council. From Haileybury he went to St. Thomas's Hospital, and qualified in medicine in 1891. His bent was towards obstetrics and surgery, and he became a Fellow of the Royal College of Surgeons of England within two years of his qualification, and in the following year, 1894, M.B., B.S. (London), obtaining the gold medal in obstetric medicine and qualifying for the gold medal in surgery.

St. Thomas's was one of the great interests of his life. He served it as surgeon for many years, and on reaching the age of retirement was elected consulting surgeon. He was also lecturer on surgery in the St.

Thomas's Medical School and afterwards Dean. Both as surgeon and as teacher, and in everything to do with the School, his skill and wisdom and devotion laid it under a great debt, and generations of St. Thomas's men in all parts of the world have occasion to think of him with affection and gratitude. He had also been surgeon to the East London Hospital for Children.

One of the outstanding experiences in his early life was his service in the South African War. In the autumn of 1899 he was asked by his friend Sir Anthony Bowlby (who, like himself, was to become President of the Royal College of Surgeons) to join the Portland Hospital in South Africa, and, Wallace eagerly assenting, they worked together there until the middle of 1900, when the hospital was dismantled. On their



(Lafayette)

return the two surgeons collaborated in producing a small book relating the story of the Portland Hospital. That, however, was only the prelude to a much more exacting and prolonged military experience. During the war of 1914-18 Cuthbert Wallace was attached as consulting surgeon to the First Army of the British Expeditionary Force and eventually became Major-General, A.M.S. Here again he was in close association with Bowlby, who, although working with the Second Army, was attached to headquarters at St. Omer, and had oversight of both First and Second. Wallace's work for the Forces during that war earned him widespread recognition. It was characterized by the thoroughness and care for detail which marked all that he did. He was mentioned in dispatches and received the C.M.G. in 1916 and the C.B. (Military) in 1918, and at the end of the war he was advanced to K.C.M.G. He wrote in collaboration with Sir John Fraser a small volume entitled *Surgery at a Casualty Clearing Station*, embodying the result of their joint experiences in that type of work during several years on the Western Front, and containing much of value for the next generation of war surgeons who came along twenty years later. It was illustrated by many sketches by Lady Fraser. When, in April, 1919, the British Medical Association held a special clinical and scientific meeting to review the medical lessons of the war he acted as joint general secretary.

For very many years Cuthbert Wallace was closely identified with the work of the Royal College of Surgeons of England. He was elected to its Council in 1919 and served until 1935, when he was made President, occupying the chair for three years. He had been a member of the Board of Examiners from 1919 to 1929, Bradshaw Lecturer in 1927, and Hunterian Orator in 1934. Many other useful activities occupied him during the later years of his life when he no longer worked in the operating theatre. Outstanding among them was his directorship of the medical services of Mount Vernon Hospital and the Radium Institute. He was also a member of the Radium Commission. He interested himself greatly in the work of the British Empire Cancer Campaign and was chairman of some of its committees. He served for some time on the Medical Research Council and was a valued member of the Army Advisory Council. His interest in the day-to-day work and difficulties of the profession showed itself in his presidency of the London and Counties Medical Protection Society. He was not content to appear at the annual meetings and make a brief speech, but he attended regularly the council and committee meetings and maintained a real interest in the detailed work of the society. As a chairman he was most businesslike. No time was wasted. The presence in the chair of this quietly efficient and dignified man made everyone feel that they must give of their best.

Sir Cuthbert Wallace's published works include volumes on the war surgery of the abdomen and on prostatic enlargement. He was the author of many contributions to *St. Thomas's Hospital Reports* and the *Transactions* of the Clinical and Pathological Societies. He was also one of the editors of the Surgery Section of Sir William Macpherson's *Medical Services of the War* (1914-18).

He was made a baronet in 1937. He held honorary doctorates of Oxford, Durham, and Birmingham, was an Honorary Fellow of the American Surgical Association, and an Officer of the Legion of Honour. He was also a J.P. for the County of London.

Sir FRANCIS FRASER, Director-General, Emergency Medical Service, writes:

Cuthbert Wallace disliked strongly the idea that he might have to give in before the end of the war. A few days before his death he was planning how he would still be able to help with advice, even though he could no longer attend the conferences at the Ministry of Health. For nearly five years as Consultant Adviser in Surgery to the Emergency Medical Service he served the country well and gave freely from his store of experience of surgery in war and in peace, from his knowledge of men, and from his capacity for wise and balanced judgment. In the earlier years of the war he visited most of the larger hospitals in the South of England and reported on their strong points and their weaknesses and the part each should play in the Emergency Scheme. Nothing he said was taken

amiss: it was so honest and so clearly helpful. The difficulties and discomforts of travelling kept him at home for the past year or more, and it was as Chairman of the Consultant Advisers that he was able to continue to help so well. Many problems arise when civilian hospitals and civilian doctors are required to deal with Service patients, and the more difficult of these were kept for discussion with Wallace. It is not, however, for his help in solving administrative difficulties that we at the headquarters of the E.M.S. owe so much to him. It is for his loyal support at all times, for his gentleness, for his friendliness, and for the atmosphere of goodness that he brought with him.

Major-General Sir ERNEST COWELL, K.B.E., C.B., D.S.O., writes:

May I add my tribute to the honoured and beloved memory of Sir Cuthbert S. Wallace. As surgical specialist to 23 C.C.S. and later O.C. 1 C.C.S. in France 1915-19 I came into intimate contact with Sir Cuthbert, who was Consulting Surgeon to the First Army. His advice and judgment were sound and always helpful. He never issued surgical directives but rather "suggestions," explaining the general idea and leaving details to the individual surgeon. His work on military abdominal surgery will be remembered, and his dictum, "The surgeon who does not trust the peritoneum is not fit to do abdominals," is still true to-day. Sir Cuthbert was an ideal Army surgeon, unselfish, devoted, courteous, and thoughtful. His name deserves undying fame.

By the death of Dr. ROWLAND HAMER at Ashton-under-Lyne on May 25, in his 70th year, the area has lost a physician who, by his original and striking personality, had earned the respect and warm regard of all his colleagues and the gratitude of many patients. He combined practical sympathy for the more needy of his clients with a sound clinical judgment, and leaves behind a well-deserved reputation as a doctor of the old school. He graduated M.B., Ch.B. at Manchester in 1899, served in France and Belgium during the last war, and had held office as a member of the Ashton-under-Lyne Town Council.

The following well-known medical men have died abroad: Dr. R. O. Rosenberger, professor of immunology and bacteriology at the Medical College of Philadelphia, aged 64; Gen. Med. Rat. Prof. Carl Jacoby, emeritus professor of pharmacology at Tübingen and one of Schmiedeberg's pupils, aged 87; Prof. Alfred Kleinknecht, for many years leading surgeon at Mulhausen, Alsace, aged 73.

## Universities and Colleges

### UNIVERSITY OF EDINBURGH

Sir John Fraser, Bt., K.C.V.O., honorary surgeon in Scotland to H.M. the King and regius professor of clinical surgery in the University, has been elected by the curators of Edinburgh University to the office of Principal, and will take up the duties of that post on Oct. 1.

### ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

Mr. Norman M. Dott, F.R.C.S.Ed., will deliver a Morison Lecture in the Hall of the Royal College of Physicians, 9, Queen Street, Edinburgh, on Friday, June 23, at 5 o'clock on "Experiences in Neuropsychiatry, Edinburgh, 1940-4."

## The Services

Temp. Surg. Lieut. T. Haw, R.N.V.R., has been mentioned in dispatches. This name appears in a list of awards for outstanding courage, determination, or devotion to duty in certain of H.M. ships in successfully escorting convoys to North Russia in the face of attacks from enemy submarines and aircraft.

### CASUALTIES IN THE MEDICAL SERVICES

*Died of wounds in Italy.*—Capt. G. E. Yardley, R.A.M.C.  
*Killed.*—War Subs. Capt. N. W. Jones, Temp. Major R. Stuppel, R.A.M.C.  
*Wounded.*—Temp. Major G. S. Ferraby; War Subs. Capt. A. P. D. Montgomery, C. P. Silver, and A. Wattison, R.A.M.C.

## A 'Hall-mark' for Vitamins

A recent Government decision will go far to give to vitamin foods the status which the hallmark gives to gold. The Ministry of Food is issuing regulations under which it is intended that foods claiming to contain vitamins must bear on the label a quantitative disclosure of these active ingredients.

This move should put an end to unsubstantiated claims that this or that food "contains vitamins." Doctors will look for the 'hallmark'—the disclosure on the packet. If the 'hallmark' is missing, they will draw their own conclusions, as they would about unstamped gold.

### THE CASE OF BEMAX

Vitamins Ltd., proprietors of Bemax, warmly approve the Government decision. For years they have preached vitamin disclosure; even more, they have practised it. Every statement as to the vitamin content of Bemax has been supported by publication, on each package, of a quantitative analysis.

1 oz. of BEMAX supplies, at time of manufacture, approximately:

Vitamin A	280 i.u.	Manganese	4.0 mg.
Vitamin B <sub>1</sub>	240-420 i.u.	Iron	2.7 mg.
Vitamin B <sub>2</sub> (riboflavin)		Copper	0.45 mg.
	0.3 mg.	Protein	33%
P.P. factor	1.7 mg.	Avail. Carbohydrate	39%
Vitamin B <sub>6</sub>	0.45 mg.	Fibre	2%
Vitamin E	8 mg.	Caloric Value	104

### DISTRIBUTION OF AVAILABLE SUPPLIES

The appropriate Ministries have asked that Bemax should be reserved for those taking it on medical advice.

Priority is accorded to hospitals, Public Health Authorities, clinics, doctors and the Red Cross.

Direct orders from members of the medical

profession will, as heretofore, be given priority. Supplies cannot, however, be forwarded direct to patients.

There is no formal rationing scheme for the public but chemists are co-operating with us to secure equitable distribution.

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The April number of the *Bulletin* of the National Association for the Prevention of Tuberculosis (Tavistock House North, Tavistock square, W.C.1) announces that the N.A.P.T. is to undertake a comprehensive investigation into the psychology of tuberculosis, to last the first place for some twelve months. All types of patients with pulmonary tuberculosis will be studied. The work will be carried out by a competent psychiatrist with an assistant psychiatric social worker. Full personality studies will form the basis of the work.

The Minister of Health has been in consultation with the Minister of Labour and National Service and the Minister of Pensions about questions which arise in connexion with the placing in suitable employment of persons suffering from some form of psychoneurosis or psychosis. Such persons often break down in the employment in which they have been placed and the Minister of Labour has experienced difficulty in finding them work which they can usefully perform. The Ministry of Labour and National Service consider that the advice of a skilled psychiatrist would be most helpful to officers at Employment Exchanges in determining whether a worker known to be suffering from psychoneurosis or psychosis whom it has hitherto been difficult to place in industry is, in fact, suitable for employment and, if so, what type of employment he or she is best fitted to undertake. Arrangements have accordingly been agreed between the Departments concerned.

The York Clinic for Psychological Medicine at Guy's Hospital, after serving some of the general needs of the hospital since the 'blitz' of 1940-1, has now been opened for its original purpose. Thirty of the forty-three beds are reserved by the Emergency Medical Service for psychiatric casualties among officers of each of the Services; the remainder are available for civilians. The acting medical director is Dr. Felix Brown and the sister-in-charge is Miss E. Purcell.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* notifications of measles, acute pneumonia, and whooping-cough exceeded those of the previous week by 123, 102, and 71 respectively, but those of scarlet fever were lower by 58.

Lancashire reported a decrease of 71, and Yorks West Riding 17, in the notifications of scarlet fever, the total for pneumonia, however, going up by 23 in the latter county. The incidence of whooping-cough rose in Kent and Middlesex by 48 and 35 respectively. Essex reported 48 more cases of measles, than last week, but in contrast to the general trend Kent reported 59 cases fewer, and Durham 53. The incidence of diphtheria in Lancashire and Yorks West Riding remains relatively high, one-third of the total cases for the country being notified in these counties during the week.

Dysentery is still prevalent, and 276 cases (4 fewer than in the preceding week) were recorded. The largest of the new outbreaks was Yorks East Riding, Bridlington M.B. 37. The other principal centres of infection were Lancashire 53, Kent 24, London 18, Northamptonshire 17, Southampton 13, Derbyshire 13, Warwickshire 12.

In *Scotland* notifications for measles were 81 fewer than last week, scarlet fever 27, and diphtheria 23, but the total for dysentery rose by 27. The 138 cases of diphtheria were the fewest reported for five months. The largest returns for dysentery were Edinburgh 21, Lanark County 17, and Glasgow 10.

In *Eire* the only change in the trend of infectious disease was an increase of 50 in the notifications of measles, almost one-third of the total being notified in Dublin C.B. A case of typhus was reported from Roscommon, Castlereagh R.D.

In *Northern Ireland* there were 22 more cases of diphtheria than last week, almost half the total being notified in Londonderry C.B. Slightly more than half the cases of scarlet fever were notified in Belfast C.B.

### Week Ending May 27

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,853, whooping-cough 2,427, diphtheria 507, measles 2,662, acute pneumonia 774, cerebrospinal fever 57, dysentery 274, paratyphoid 4, typhoid 9.

### Eire: Births and Deaths Week Ending May 13

The figures for births and deaths for Eire were not received in time for publication in the general table. The figures were: births 593, deaths 222, deaths 0-1 year 29; death rate 14.4; deaths from paratyphoid (B) 1; scarlet fever 0; whooping-cough 0; diphtheria 1; measles 2; diarrhoea 8; influenza 1; pneumonia 9.

No. 23

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 20.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	62	6	20	4	3	68	2	19	2	2
Deaths .. ..	1	1	2			2	1	1		
Diphtheria .. ..	598	23	138	75	55	619	41	162	65	19
Deaths .. ..	3	2	2	1		12	1	1		
Dysentery .. ..	276	18	81	—	—	146	18	73	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Encephalitis lethargica, acute .. ..	—	—	—	—	—	—	—	—	1	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Erysipelas .. ..	—	—	44	8	3	—	—	42	9	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years .. ..	—	—	—	17	—	—	—	—	13	—
Deaths .. ..	45	9	14	8	4	63	16	6	9	3
Measles .. ..	2,255	213	479	211	25	8,377	430	561	17	33
Deaths .. ..	1	—	—	2	—	7	3	3	—	—
Ophthalmia neonatorum ..	98	6	35	—	—	97	5	17	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Paratyphoid fever .. ..	3	—	9 (B)	16 (B)	—	4	—	1	—	—
Deaths .. ..	—	—	1 (B)	1 (B)	—	—	—	—	—	—
Pneumonia, influenza* ..	806	63	22	8	8	672	38	4	—	3
Deaths (from influenza) ..	17	2	2	1	—	15	3	1	1	—
Pneumonia, primary .. ..	—	—	205	35	—	—	—	208	23	12
Deaths .. ..	—	30	9	6	—	—	26	13	—	—
Polio-encephalitis, acute ..	1	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Polio-myelitis, acute .. ..	5	1	2	—	—	7	—	1	3	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever .. ..	—	1	12	—	—	—	2	15	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† .. ..	142	4	16	1	1	183	7	18	1	7
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever .. ..	1,733	121	172	20	56	1,740	155	250	49	41
Deaths .. ..	2	1	—	—	—	—	—	—	—	—
Smallpox .. ..	—	—	—	—	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever .. ..	5	—	2	3	1	12	1	2	15	1
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Typhus fever .. ..	—	—	—	1	—	—	—	—	—	—
Deaths .. ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough .. ..	2,619	239	182	38	25	2,446	128	287	14	36
Deaths .. ..	11	4	1	—	1	15	1	4	1	1
Deaths (0-1 year) .. ..	324	46	79	29	18	375	53	63	46	21
Infant mortality rate (per 1,000 live births) ..	—	—	—	—	—	—	—	—	—	—
Deaths (excluding still-births) ..	4,077	634	584	222	136	4,454	637	627	242	14
Annual death rate (per 1,000 persons living) ..	—	—	13.4	14.4	†	—	—	14.1	15.9	†
Live births .. ..	7,339	882	1,030	593	350	6,985	817	1,037	389	34
Annual rate per 1,000 persons living ..	—	—	20.9	—	†	—	—	21.2	25.6	†
Stillbirths .. ..	222	25	30	—	—	221	18	34	—	—
Rate per 1,000 total births (including stillborn) ..	—	—	28	—	—	—	—	32	—	—

\* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 2111. TELEGRAMS: *Antology Western, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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### ANY QUESTIONS?

#### Tobacco, Alcohol, and Hypertension

**Q.**—What part, if any, is played by tobacco and alcohol in the production or maintenance of so-called essential hypertension? Many intelligent patients with this condition, and otherwise fit, have asked me what are the scientific reasons that prompt me to advise them to abstain from these drugs. What change in the B.P. readings is likely to occur in an otherwise fit man who is a heavy smoker and moderate drinker with a B.P. of, say, 165/110 if he completely abstains from these consolations for some months?

**A.**—There is no evidence that tobacco or alcohol plays any part in the production or maintenance of essential hypertension, and the patient under discussion is unlikely to show any improvement in his blood pressure if he abstains from them. It is true that transient rises in blood pressure have been described following smoking, particularly in those unaccustomed to tobacco and in individuals with effort syndrome or hyper-reactive vascular systems. These effects are apparently mediated by peripheral vasoconstriction of nervous origin and are quite different from the humoral vasoconstriction of essential hypertension. There is no evidence that the blood pressure is higher in smokers than in non-smokers, or that smoking has any uniform effect on the blood pressure of hypertensives. As emotional factors are believed to be important in maintaining hypertension, it would seem undesirable to put the patient to the strain of giving up tobacco entirely. On the other hand, both scientific and clinical evidence indicate that tobacco is harmful in Buerger's disease, in endarteritis obliterans, and in angina pectoris. In alcoholism the tendency is to low rather than high pressure. The patient should be told that moderation in all things is the golden rule in the treatment of hypertension, and he should practise a temperance which implies neither complete abstinence nor excessive indulgence in tobacco and alcohol.

#### How to Interpret the W.R.

**Q.**—To what extent does a positive Wassermann reaction or similar test indicate the presence of syphilis? If the test is positive when repeated, is one justified in starting treatment? How should one interpret (a) a weak positive, (b) a doubtful Wassermann reaction? To what extent does a negative reaction exclude syphilis?

**A.**—A positive W.R. carried out by a reliable pathologist is confirmatory evidence of syphilis if a patient has clear-cut signs of the disease. In the absence of signs of syphilis no positive serum test, no matter by whom it is done, even if it is positive on a second specimen, in itself justifies institution of antisyphilitic treatment. Quite a number of pathological conditions—mostly tropical diseases and therefore not likely to be met with in this country—may be responsible for false positive reactions. But such conditions as glandular fever, scarlet fever, pneumonia, late tuberculosis, diabetes mellitus, enteric fever, and malignant tumour—to mention only a few—have been incriminated from time to time. Recent vaccination also has been shown to be a cause. In addition there are people, very few it is true, whose sera appear to be "labile" in that they give false positive reactions without apparent reason.

In most of the above conditions the W.R. remains positive only for a comparatively short time, and tests repeated over a period of three months will usually show a weakening of the reaction or return to negativity. As a general rule, therefore, one should not diagnose syphilis on serum reactions alone unless they remain positive for at least three months. Meantime, a complete clinical examination of the patient should be carried out, including radiography of the heart and great vessels and examination of the cerebrospinal fluid.

The term "weak positive" should never be used. A "doubtful" reaction is one which is neither positive nor negative, and, except in an established case of syphilis, should merely serve as an indication for further investigation, both clinical and serological. A nega-

tive reaction does not exclude syphilis. The serum of a syphilitic patient gives a negative reaction in the first few days after the appearance of the sore, and not infrequently in the late stages of syphilis and especially in tabes dorsalis, not to say in syphilis which has been insufficiently treated.

#### Menopausal Obesity

**Q.**—It is well known that women about the time of the menopause tend to increase in weight. One of my patients has put on several stone and is very anxious to have this reduced. I prescribed thyroid, which is fairly effective, but I am concerned as to the effect of continued doses over a long period. Is there any other line of treatment which is effective, in addition to dieting, which the patient is already carrying out?

**A.**—The increase of weight at the menopause is probably associated with hypertrophy of the pituitary and adrenal glands at this time, although a great deal depends on genetic constitutional factors. There is no known "anti-adiposity" hormone yet available. Thyroid is not a specific, and even taken in doses sufficient to cause toxic symptoms it is unlikely to be fundamentally helpful. Nevertheless, it is useful in some degree, and I have not seen harmful effects from taking thyroid over a long period, providing the dose does not produce tachycardia or a pulse rate increased above normal. Dieting is helpful, but not fundamental treatment, and even on low-calorie diets the results are far from satisfactory in severe cases. Since there may be an associated element of salt-water retention, some patients respond in some degree to the additional therapeutic measure of mercurial diuretics—e.g., neptal, mersalyl, or salyrgan, 1 c.cm. intramuscularly, twice weekly, preceded the day before by 1 g. of ammonium chloride in capsule, t.d.s. Exercise and massage are also of some slight value.

#### Early Suckling

**Q.**—I have found recently in domestic midwifery practice that many midwives and nurses are advising mothers not to put the baby to the breast until the third day, the idea apparently being to prevent too much congestion of the breasts with milk and the resultant pain and discomfort to the mother. This is contrary to my teaching, which stressed the value of colostrum, etc. Is there anything in this new idea?

**A.**—There is no evidence that suckling during the first few days of the puerperium causes abnormal congestion of the mother's breasts, or that the postponement of suckling until the third day reduces any discomfort the mother may have when the milk comes into the breasts. The mother must get to know her baby and the baby must learn to suck, and what better time than the few days before the milk begins to flow? And suckling is the best stimulant to a good supply of milk. Colostrum is also said to contain protective substances and to have a beneficial laxative action. The practice of advising mothers not to put the baby to the breast until the third day should therefore be discouraged.

#### Hypnotics and Sulphonamides

**Q.**—Which is the most suitable (a) hypnotic, (b) analgesic during treatment with the sulphonamides? (c) Is acetyl salicylic acid safe during such treatment?

**A.**—The only hypnotic or analgesic drug particularly contra-indicated during sulphonamide treatment is amidopyrine. This, like the sulphonamides, occasionally causes agranulocytosis, and the combination of the two acts synergically and is very much more liable to do so. It should not be forgotten that amidopyrine (also known as pyramidon) is included in various sedative preparations known by proprietary names: these include both ethical products and patent medicines. Among the former are allonal, amidophen, cibalgin, compral, gardan, sinepan, trigemin, and vcramon.

#### Fasciculating Muscles

**Q.**—A man in the early thirties has for several years complained of involuntary contractions of muscle fibres. The contractions are identical with those fibrillating twitchings that most people have sometimes felt in the eyelids. In this case, however, they are on a larger scale and may affect any muscle in the body, but chiefly thighs, upper arms, eyelids, and quite a large number of fibres may be involved. The previous health has been good. There is no wasting but some tendency to obesity. No loss of muscular power. C.N.S. appears normal, but knee-jerks are unobtainable at times, and when present are very slight.

**A.**—This is an excellent description of a rare condition in which the muscles fasciculate without any evidence of any motor neurone disease. Although it is rare the condition is well recognized by neurologists, to whom it is usually referred as amyotrophic lateral sclerosis. The prognosis is good and no disability results, although, occasionally the subject will complain of a little fatigability. The only treatment required is explanation and reassurance.

## Ejaculatio Praecox

**Q.**—A patient aged 35 complains that for the past 2½ years he has suffered from precipitate orgasm. The orgasm itself is normal, with normal seminal emission, but always occurs as the penis is being introduced into the vagina. He is not sterile, and a child has been conceived under these circumstances. During the previous five years of married life coitus was quite normal. It is preying on his mind, he more so because his wife is showing signs of emotional stress.

**A.**—It is impossible to give an adequate reply to this question without a full psychiatric history of the case. Ejaculatio praecox is a symptom of a great variety of psychoneurotic disorders from mild hysteria to latent homosexuality. Some light on the aetiology of the condition is thrown by descriptions of apparently analogous cases in married men of the same age in Dicks's *Clinical Studies in Psychopathology* (Edward Arnold, 1939). In general it has often been observed that the age between 35 and 40 is a critical one for men, characterized by disturbances of a psychosexual order. This crisis seems to be part of a process of maturing, but may bring to light previously unsuspected conflicts. Where this occurs there is only one course—namely, a consultation with a psychiatrist, preferably for both marriage partners. No rule-of-thumb remedy is at hand. In view of the previously normal function the prognosis with adequate psychotherapy is probably hopeful in this case.

## Disseminated Sclerosis

**Q.**—Is there any effective treatment for disseminated sclerosis? I have a patient who contracted the disease about six years ago with the usual retrobulbar neuritis. She has now much pain and weakness in the arms.

**A.**—There is still no specific treatment for disseminated sclerosis. The claims which have been made for different therapeutic agents have mostly been due to the association of a spontaneous remission, which is characteristic of the disease. None of these agents, which include arsenic, serum, and vaccines, have been proved beneficial in controlled trials. There is, however, much to be done with the treatment of symptoms. This includes physiotherapy, relief of bladder symptoms, re-education in defective functions, and, most important, the maintenance of hope.

## LETTERS, NOTES, ETC.

## A "Gastric Board"

Capt. C. N. JEFFRIES (Army Dental Corps) writes: The object of the "gastric board," mentioned by Brigadier Edwards and Lieut.-Col. Copeman (Nov. 20, 1943, p. 640), is research into the causation of dyspeptic disorders, but to a dental surgeon the board appears to suffer from a grave omission. Consider the physiology of normal digestion: (1) a lump of food is cut off by the incisor teeth; (2) it is torn to shreds by the molar and premolar teeth, and mixed with saliva with the aid of the tongue and cheek muscles; (3) the prepared bolus is swallowed; (4) the fundus stores the bolus and surrounds it with gastric juice; (5) the pyloric antrum finishes the grinding process and mixes the food with the gastric juice. Failure of stage 2 will upset stage 5, because the food will require an excessive time to be broken down, and its surface area is too small to allow the gastric juice to act throughout the whole mass. The result is, therefore, hyperchlorhydria, not due to hypersecretion but to insufficient digestion. This process may in time lead to hypo-secretion, but in any case a disturbance of function will result. Stage 2 may fail either because of the habit of not chewing each mouthful or because of loss of teeth or the wearing of inefficient dentures. Out of 217 "non-ulcer" cases no fewer than 180 were classed as "no physical disease detected (functional dyspepsia)" and only 37 had progressed to the presence of physical lesions which could be diagnosed. It would be useful to know how many of these patients had deficiencies of their masticatory apparatus. The inclusion of a dental officer in the "gastric board" may lead to some useful conclusions on the aetiology of the conditions under examination. This is a field where dentistry can be called upon to play its part, and the dental surgeon can here contribute his share to preventive medicine.

## First Aid according to St. John's

Dr. BEAUMONT COMERFORD (Tolleshunt Darcy, Essex) writes: I have long wondered when a new textbook on first aid would be published. The subject-matter must often be quite unintelligible to the untutored recipients, and the lecturer himself may be a little at sea in his knowledge of these surgical catastrophes and their treatment in first aid. His cross-examining listeners may cause him to camouflage some of his answers. Dr. Truman in his letter (p. 703) stressed that the possession of this book "is a Tommy-gun to a child." The first-aiders may, if heroic, do some harm to the public. When a house officer at a London

hospital I saw a dead man brought in by the police: a handkerchief which had been twisted by a baton was still *in situ* on the thigh. The haemorrhage had come from a varicose ulcer of the leg. I was sorry for the constable; he was only doing what he had been told, and this tragedy had happened. At the inquest I remember stressing that the man had died of haemorrhage, but was not asked why.

## Localized Postural Oedema

Dr. E. L. GAVIN (Kilbeggan) writes: I was much interested in the reply given in the "Any Questions?" column to the query on localized postural oedema (May 13, p. 697). Has any work been done on the B.S.R. in this condition? At present I have two cases very similar to those described, but in each case the B.S.R. is very high (over 40 mm. in 1 hour, micro method). In view of this, and of a previous history of vague rheumatic pains, I am treating them as cases of latent rheumatic "fever" despite any clinical evidence of this.

## Two Answers

Dr. LEONARD LEY (Great Yarmouth) writes: I was interested in two of your questions in the issue of May 27. As regards coitus during pregnancy (p. 737), I am firmly convinced that this is the most frequent cause of miscarriage, and in the course of my career I have enabled numerous women to have full-term pregnancies after repeated abortion by forbidding intercourse.

The other was "a patient's dilemma" (p. 738), which amused me by the fact that it was such an excellent example of the profession's subservience to science in place of common sense. The victim suffers from nervous diarrhoea in church and is to be married, and feels sure he cannot "hold out" in church. Your correspondent deals at great length with the question but omits the obvious advice of a registry office.

## Implantation Cancer

Dr. HAROLD J. SELBY (Newnham, Glos.) writes: Under the heading "Any Questions?" (May 6, p. 665) you are asked if any case has ever been recorded of cancer of the penis following intercourse with a woman suffering from carcinoma of the cervix. In view of the answer given to this question the following may be of interest. Both cases occurred in my practice. Mr. A. consulted me in March, 1933, at the age of 50, on account of a "sore" on the glans penis. He had first noticed this two weeks previously. Section proved it to be an epithelioma. He was treated with radon seeds. Two months later severe haemorrhages occurred which the patient only just survived. By October healing was almost complete and by the end of the year all was well. No recurrence has taken place and the patient is alive and well. In October, 1937, his wife consulted me at the age of 55 on account of vaginal haemorrhage. Examination revealed an extensive new growth. Section proved this to be a columnar-celled carcinoma. She was treated with radium, but only survived till September, 1938. Admittedly there is a gap of four, nearly five, years between the cure of the one and the discovery of the other; but the cervical carcinoma was extensive and inoperable when discovered, so that this gap was certainly much less than 4½ years and possibly very much shorter.

## An Old Midwives' Tale

Dr. NORMAN GOORNEY (London, S.E.10) writes: The viability of a seven-months babe and the non-viability of an eight-months have recently been discussed by your correspondents, who have whittled the origin of this down to the sixteenth century. I assure them that its origin goes back much further. It is written in the Jewish Talmud, Tractate Revomuth, page 80, and is therefore accepted as true by all learned Jews since 2,000 years and more ago when the Talmud was scribed. It is to be found for the first time in medical literature in the writings of the famous Jewish physician of the twelfth century known as Rashi.

## Unusual "Deficiency" Diseases in Barbados

Dr. J. F. C. HASLAM (Director of Medical Services, Lusaka, Northern Rhodesia) writes: Dr. M. Lattey of St. George's, Bermuda, has stated in your issue of Feb. 12, p. 244, that while working in Barbados he found two conditions which he had not seen described anywhere, and he asks whether anyone else has seen those conditions. Dr. Lattey has called the first condition to which he refers "deficiency nephritis." I cannot say that I remember having seen that condition in Barbados when I lived and worked there, but I now feel fairly confident that some at least of the large amount of nephritis which occurred, and perhaps still occurs, in British Guiana may be connected with a dietetic deficiency. Many have speculated on the possible causes of the nephritis which has for long been a notable feature of the statistics of morbidity and mortality in British Guiana, and Dr. Lattey may find it worth his while to write to Dr. Wase Bailey, who is now chief medical officer of Barbados, who wrote, about 1925, a very interesting study of nephritis in British Guiana.

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## CONTROL OF SCABIES BY USE OF SOAP IMPREGNATED WITH TETRA-ETHYLTHIURAM MONOSULPHIDE ("TETMOSOL")

BY

R. M. GORDON, M.D., Sc.D., F.R.C.P. T. H. DAVEY, M.D. K. UNSWORTH, B.V.Sc., M.R.C.V.S.\*

F. F. HELLIER, M.D., F.R.C.P. S. C. PARRY, M.R.C.S., L.R.C.P., D.P.H.

Lieut.-Col., R.A.M.C.

AND

Capt., R.A.M.C.

J. R. B. ALEXANDER, M.B., B.Ch.

Capt., R.A.M.C.

It is now generally recognized that scabies spreads from one individual to another by the transference of the mite causing the disease, and that this transference may be direct or indirect. Indirect transference is responsible for a minor proportion of infections, and may be efficiently controlled, when necessary, by disinfection of fomites. In direct transference, which is responsible for the majority of infections, the more intimate the contact the greater the chances of spread: hence scabies is often spoken of as a venereal disease, though it would be more apt to call it a family disease, in which the highest proportion of infections are acquired between husband and wife, parent and child, and so on. Up to the present time the only method used to control the direct spread is by treatment of the infected individual, and, with the exception of Johnson's (1943) suggestion that persons likely to be in contact with cases of scabies should dip their hands in solutions of benzyl benzoate, we are not aware of any proposed method of prophylaxis which might be used by the individual to protect him against the disease.

The idea of controlling scabies by the use of soap impregnated with tetmosol originated in animal experiments with *Notodres*, the results of which have already been published (Davey, Gordon, and Unsworth, 1944). Since the publication of that paper we have extended our observations to include human cases caused by *Sarcoptes scabiei*, and we here present the results of these investigations, together with some of our original observations.

In view of the high sarcopticidal activity of tetmosol in human and animal scabies (Gordon and Seaton, 1941; Percival, 1942; Jennings, 1942; Clayton, 1943) it appeared to us that, if the drug could be incorporated in soap and still retain its potency and non-irritative properties, it would then be available for prophylaxis and possibly for the treatment of mild infections without the necessity for medical supervision. In the Army, for instance, or in dealing with crowds of refugees, tetmosol-impregnated soap could be issued without the need for parades and disciplinary measures. Similarly, in an outbreak of scabies in factories, asylums, schools, and similar concentrations of people, it might be possible to control the infection by the provision of impregnated soap at the wash-basins. Johnson (1943) has written: "It may be said . . . that if all the mites on the hands and wrists of all patients alone could be killed (e.g., by dipping in benzyl benzoate solution), then about 60% of all the parasites would be eliminated. This might have a progressive and great effect on the reduction of the disease." We doubt whether Johnson's suggested treat-

ment would be carried out in the absence of supervision, but we believe that a tablet of tetmosol-impregnated soap of normal appearance would arouse no antipathy and would be used.

In order to ascertain whether such a soap could be employed to control scabies it was necessary to establish that tetmosol could be successfully combined with soap and remain stable on storage. This was accomplished by Imperial Chemical Industries, Ltd., in collaboration with Messrs. Unilever, Ltd., and the soap was found to remain chemically unaltered when tested at monthly intervals over a period of a year. There still remained the question whether the use of such a soap would result in dermatitis, and whether tetmosol would retain its sarcopticidal properties when used in this form.

### Risk of Dermatitis from Tetmosol Soap

The risk of dermatitis from any drug will obviously be affected by the concentration of the drug, the idiosyncrasy of the individual, the period of time over which it is used, and the frequency of its application.

It is difficult to give a reliable average figure for the number of times the ordinary person washes during the course of the day, for the length of time he spends on the process, or for the degree of dilution of the soap applied to the skin. By studying the ablutions of a number of individuals, however, we found that they spend about 40 seconds in lathering either the face or the hands (in the case of a bath the whole body is lathered for about 60 seconds), and that if a drug is incorporated to the extent of 10% in soap its dilution when applied to the skin is in the region of 1.8%; further, we found that it is the common practice to wash off the soap with about six changes of water. On these observations our subsequent trials with the soap were based. The frequency of washing obviously varies according to the individual, but a rough idea of the extent to which soap is used in the Army was obtained by sending a questionnaire to 150 R.A.M.C. officers, whose replies suggested that almost 100% of the men wash the hands and face at least once a day and the body at least once a week, and that the majority probably do not use soap on the hands and face more than two or three times a day.

Evidence from the literature suggests that tetmosol, when applied to persons with dermal lesions due to scabies, only occasionally produces dermatitis (Percival, 1942; Clayton, 1943). Our own experiments with tetmosol soap confirm these findings: 242 patients suffering from proved scabies received three baths with 20% tetmosol soap during the course of six days; of these, four developed dermatitis; in three of these cases of dermatitis patch-tests showed that the reactions were not due to tetmosol; the remaining case was not tested. It follows, therefore, that only a low incidence of dermatitis is liable to occur after the use of tetmosol soap when applied for short periods to the skin, even when this has already been damaged by scabies. These results, however, did not directly

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concern us in the present investigation, since the point to be established was whether or not tetmosol soap, when applied prophylactically for long periods to the normal skin, was apt to produce dermatitis. This must remain unanswered for the time being, since it can only be determined by a prolonged use of the soap by a large number of people. We have, however, certain evidence which is of some value. In our own experiments three volunteers in the laboratory have used soap containing 5% tetmosol twice daily on the face and hands, and once a week on the body, for two months without dermatitis resulting. Subsequently, one of the volunteers similarly used 10% tetmosol-impregnated soap for a further period of a year, and another used 20% tetmosol soap for a further period of six months, without ill effect in either case.

A further test over a shorter period was carried out by Major Kenneth Mellanby, R.A.M.C., who distributed two tablets of 10% tetmosol soap to each of 29 volunteers (conscientious objectors). All used the soap as long as it lasted, but the time varied with the care of the user; thus six men made it last only 14 to 18 days, but the remainder made it serve for as long as 63 days. The average for all users was 34 days. The following is quoted from Major Mellanby's report on "Skin Reaction":

"Six subjects observed no unusual sensations when they used the soap, but 23 of the 29 volunteers reported that some irritation of the skin occurred. In 12 cases this was very slight and transitory—generally just a slight stinging of tender areas after soaking in a hot bath; had these subjects not known that they were using a special soap they might not have noticed this symptom.

"Nine volunteers complained of more serious irritation, but this caused no erythema or other skin reaction. These volunteers continued to use the soap until it was finished, and mostly found that, if anything, the irritation was less severe towards the end of the exposure. There is nothing to suggest that there would have been any danger in these subjects continuing to use the soap for long periods; they agreed to continue for longer if necessary.

"Two subjects reacted more severely, and in the first instance they used the soap for only two and five days respectively. Brigadier R. M. B. MacKenna has examined both these patients, and reports that they are both individuals with unusually sensitive skins. One is genuinely sensitive (but only slightly) to tetmosol; in the other the impregnated soap acted apparently as a primary irritant. In both cases the skin recovered completely when the use of the soap was discontinued. It is obvious that these two volunteers would be unable to use tetmosol soap permanently; but, if the soap were issued to a large population, individuals of this type would discover that the soap disagreed with them before any damage had been done. It seems likely that the proportion of such individuals in Southern Europe and the Balkans (where the soap might be most useful) is considerably lower than in this country.

"The general conclusion seems to be that most people will not be harmed at all by the soap. A small minority will find it a skin irritant, but this fact will be easily detected before any harm is done. There is no evidence to suggest that anyone is highly sensitive to tetmosol soap."

#### Sarcoptidicidal Properties of Tetmosol Soap when Used Therapeutically

##### In Animal Infections due to *Notoedres*

As already stated, observations on the washing habits of a number of individuals enabled an estimate to be made of the final dilution of the drug incorporated in soap when it reached the skin, and of the length of time during which the drug would be in contact with the skin. Infected rats were subjected to treatment similar to that which would be used by a person performing his ordinary ablutions. The infected area was washed for 40 seconds with a known dilution of soap lather. The soap was immediately washed off with six consecutive applications of clean swabs of cotton-wool dipped in clean warm water. Using this technique with soap containing 5% tetmosol (final dilution of the drug 0.9%) twice daily for periods of two to seven days, it was found that in only a few instances was the treatment followed by cure (8 animals treated, 1 cured)—that is to say, by the complete destruction of all mites in the treated area; such treatment, however, invariably resulted in the destruction of a large number of mites. By increasing the concentration of tetmosol in the soap to 20% a greater proportion of mites were destroyed, although, as before, the majority of cases were not cured (6 animals treated, 1 cured). Further experiments were now carried out in which the rats

were treated in a manner corresponding to a person taking a weekly bath—i.e., the washing period was increased from 40 to 60 seconds, and instead of the operation being repeated twice daily it was performed once a week. Six rats were treated in this manner: in no instance did a complete cure result, and, although there was a considerable reduction in the mite population as compared with controls, this was not so marked as in the case of 20% or 5% tetmosol when used twice daily.

##### In Human Infections due to *Sarcoptes scabiei*

Having shown that tetmosol soap possessed curative properties in respect of animal infections due to *Notoedres*, it remained to be shown whether it also possessed similar therapeutic effects in the case of human infections with *Sarcoptes scabiei*. Facilities for the investigation were obtained by arrangement with the War Office, soldiers suffering from scabies being sent to centres under our control. The total number of cases which received a full course of treatment was some 250, but owing to military exigencies only 110 were available for the entire subsequent observation period. In order to put the investigation on a scientific basis the following rules were rigidly adhered to and applied to all the cases recorded in this paper:

1. Every case recorded as positive was diagnosed by the finding of the live acarus.

2. All relapses were similarly diagnosed by the finding of the live acarus, any doubtful case being kept under observation until either a cure or a relapse had been definitely proved.

3. The bathing was supervised by a medical orderly, and the procedure was as follows: (i) The patient took a hot bath, using tablet of 20% tetmosol soap. (ii) The patient stepped out of the bath and, assisted by an orderly, was thoroughly lathered all over (except for the face and neck), attention being given to such parts as the feet, which might otherwise have escaped the application of soap. (iii) The patient stepped into the bath, rinsing off the soap. (iv) Thorough lathering with tetmosol soap was then repeated on the bath. (v) The soap was again rinsed off in the bath. (vi) The patient dried himself and dressed. (vii) Daily inspection were made, and any evidence of itching or skin reaction was recorded. In the case of treatment by six baths, these were given on successive days; in the case of treatment by three baths, some of the patients received their baths on the first, third, and fifth days; others on the first, third, and sixth days.

4. After treatment was completed, every case was kept under observation for a period of at least six weeks. So far as was possible, patients were recalled for observation at weekly intervals and where such frequent attendance was not possible each case was examined by one of us at least twice during the six weeks, one of these examinations always occurring at the end of the observation period.

**Results Obtained (a) After Six Baths.**—The first six cases in which the acarus was found were given one tetmosol-soap bath on each of six consecutive days. All were observed for six weeks after the completion of treatment. All six cases were cured.

**Results Obtained (b) After Three Baths.**—A total of 11 cases were treated by means of three baths with 20% tetmosol soap and were subsequently observed at intervals over a period of six weeks. Of these 110 cases, 88 (80%) were cured. In practically every patient, including some of those who were not cured, treatment was attended by an immediate disappearance of irritation, the man often getting his first sound sleep for several nights.

Of the 110 cases treated by means of three baths with 20% tetmosol soap 22 (20%) relapsed. In the majority of relapses the irritation persisted after treatment, but in a small proportion it disappeared completely for periods varying up to three weeks, the renewal of the irritation being often associated with the finding of the acarus.

It must in fairness be stated that these figures, for reasons beyond our control, are biased in favour of relapse. In the first place, it is probable that a number of the cases recorded as failures were really reinfections, as there was ample opportunity for re-exposure, particularly in the case of men returning to infected families. In only four instances, however, was it possible to obtain clear evidence of re-exposure to infection; these four cases have been omitted. Secondly, cases which relapse are noted earlier than those which are cured, as the latter are recorded only at the end of six weeks and so are more likely to be lost to view than those which have relapsed.



From the results recorded above it was clear that a high proportion of established cases of human scabies with well-marked lesions were cured when thoroughly washed on three occasions with 20% tetmosol soap, and that tetmosol soap was much more effective in curing natural infections with *Sarcoptes* in man than with *Notoedres* in rats.

The main object of our investigation, however, was to show whether tetmosol soap could be used as a prophylactic against the acquirement of the disease. The practical difficulties involved in a controlled experiment with human volunteers were found to be so considerable that this was not attempted. It was thought that, if it could be shown that the use of tetmosol soap protected rats against the acquirement of the disease when exposed to massive infection from their companions, this result, when considered in conjunction with the proved therapeutic value of the soap in human infections, would warrant its trial on a large scale in an infected human community.

#### Sarcoptidical Properties of Tetmosol Soap when Used Prophylactically

In order to test the prophylactic value of tetmosol incorporated in soap, white rats were confined in a large tank. Some of these received no treatment; others were washed over the entire surface of the tail with unmedicated soap, the soap, as before, being washed off with six fresh swabs dipped in warm clean water. The remaining rats were similarly treated, but tetmosol in various strengths was incorporated in the soap. After three days of treatment a number of rats suffering from severe *Notoedres* infection were introduced into the tank containing the uninfected rats, the tail-washing of the uninfected rats being continued. From now on, the rats were examined daily for gross evidence of infection, but the burrows were not opened up until the end of the experiment, when the animal was killed, the tail removed, and a careful microscopical examination made of all papules.

Although it appeared to us unlikely that impregnated soap applied for a short period at relatively long intervals would prove effective as a prophylactic, our first experiments were designed to imitate a person taking a weekly bath with tetmosol soap, the soap not being used during the intervening period. A series of five experiments were carried out using the technique described above. The results are shown in Table I.

TABLE I.—Showing, in a colony of 20 clean rats in constant contact with 6 rats heavily infected with *Notoedres*, the prophylactic effect of washing an area of skin (the tail) for 40 seconds once a week during three to five weeks with 5%, 10%, and 20% tetmosol soap

No. of Rats	Treatment	Period of Exposure to Infection in Days	Post-mortem Examination of the Treated Area (the Tail)	
			Average No. of Live Mites	Average No. of Eggs
7	Unmedicated soap	18 (1)	57	313
		22 (1)	115	640
		23 (3)	195	980
		25 (1)	131	747
		30 (1)	190	648
3	5% tetmosol soap	19 (1)	3	23
		22 (2)	14	69
7	10% tetmosol soap	24 (2)	24	82
		25 (3)	47	160
		30 (1)	17	67
		31 (1)	91	185
3	20% tetmosol soap	18 (1)	2	6
		22 (2)	0	0

It can be seen from Table I that neither 5 nor 10% tetmosol-impregnated soap, when used at weekly intervals, protected any of the rats from the disease. On the other hand, if the results following the use of the tetmosol-impregnated soaps are compared with those following the use of unmedicated soap it will be seen that in every instance the development of the disease had been controlled, so that fewer live mites and eggs were found in animals treated with impregnated soap than in those treated with ordinary soap. The table also shows that there is a tendency (which can be seen in almost all the series recorded) for the infection to become rapidly and progressively heavier with each day of exposure. This fact properly explains the apparent anomaly that a larger number of eggs and

live mites were found in rats treated with 10% tetmosol soap than in those treated with 5%, for the former series were exposed to massive infections for longer periods than the latter.

The results obtained by using 20% tetmosol soap were surprisingly good, considering the shortness of the application and the long interval between treatments: no mites or ova were found in the tails of the two rats which had four treatments in 22 days' exposure to infection; and in the remaining rat, which had 18 days' exposure to infection and three treatments, two mites and six ova only were found.

These experiments show that weekly treatment by washing with tetmosol soap of strengths varying from 5 to 20% did reduce the infection, in spite of the massive risk to which the rats were exposed. It is possible that weekly bathing with tetmosol soap might have greater value in the case of human beings than in the case of rats, for the risk of scabies infection in man is immensely less than among the rats recorded in these experiments. Even in a heavily infected person the number of mites present is relatively small in comparison with the enormous number found in such heavily infected rats as the carriers used in our experiments, and the same continuous and intimate contact does not exist between uninfected and infected human cases as it does in the rats in the above experiments. Moreover, it must be remembered that clean rats themselves rapidly became carriers, since untreated areas, such as the paws, nose, and ears, were soon heavily infected.

Having shown that a weekly bath with tetmosol soap protected only a small proportion of the rats exposed to infection with scabies, and reduced the intensity of the infection in the remainder, our next experiments were designed to ascertain whether daily washings with tetmosol soap would have a more marked prophylactic effect. They were planned in imitation of a person using 5% tetmosol soap for his daily ablutions, the technique used being the same as in the previous experiments. The results obtained are shown in Table II.

TABLE II.—Showing, in a colony of 18 clean rats in constant contact with 6 rats heavily infected with *Notoedres*, the prophylactic effect of washing an area of skin (the tail) for 40 seconds twice daily with 5% tetmosol soap

No. of Rats	Treatment	Period of Exposure to Infection in Days	Post-mortem Examination of the Treated Area (the Tail)
6	None	28 (1)	Live mites and ova — — —
		33 (2)	
		34 (2)	
		35 (1)	
6	Unmedicated soap	13 (1)	Live mites and ova — — —
		28 (1)	
		29 (1)	
		30 (2)	
		36 (1)	
6	5% tetmosol soap	25 (1)	No live mites, ova, or mite remains
		28 (1)	
		29 (1)	
		30 (2)	
		36 (1)	

The results recorded in Table II show that washing the skin twice daily with unmedicated soap has no protective value against rat scabies, but that similar washing in which 5% tetmosol is incorporated gives complete protection among rats constantly exposed to heavy infection for a period of 25 to 36 days. It will be noted that no mite remains were found in the treated area. In spite of this, papules were present, which were presumably caused by invading mites. If this presumption is correct the action of tetmosol would appear to be not that of a repellent but rather that of a lethal agent which destroys the mites after they have penetrated the treated area of skin.

#### Conclusions and Summary

Tetraethylthiuram monosulphide (tetmosol) when combined with soap in 5, 10, and 20% dilutions has been shown to retain its sarcoptidical properties.

In cases of rat scabies due to *Notoedres*, tetmosol soap was shown to produce a local therapeutic effect when used daily or weekly, the local infection being cured in some cases, the mite population being reduced in others.

In cases of human scabies six men suffering from *Sarcoptes scabiei* infection received five to six baths with 20% tetmosol soap on successive days; all were cured. A further series of 110 men received three baths with 20% tetmosol soap over a period of a week. All these cases remained under observation for at least six weeks, at the end of which period 88 (80%) were found to have been cured, and 22 (20%) to have relapsed.

Although it has been shown that the repeated use of tetmosol soap cures a high proportion (80%) of established cases of scabies, the soap is unlikely to supersede any of the standard methods employed which result in more than 90% cures. On the other hand, the simplicity of procedure involved in supplying the patient with a tablet of soap and instructing him to use it when bathing suggests the possible value of the soap if it is used therapeutically in communities which have become disorganized as a result of war, and in which it is not practicable to employ standard methods of treatment.

In the case of clean rats heavily exposed to *Notoedres* infection from their companions, washing the tail once weekly with 5 and 10% tetmosol soap was followed by a marked reduction in the number of mites developing in the skin as compared with controls washed with unmedicated soap. When 20% tetmosol soap was similarly used once weekly the effect was more striking, two rats being completely protected against infection over 22 days, and the remaining rat developing only a very light infection.

In contrast to the partial protection provided by weekly washing with tetmosol soap, the regular use of 5% tetmosol soap twice daily on the tails of clean rats constantly in contact with companions suffering from severe *Notoedres* infection gave complete protection to the treated area during periods of 25 to 36 days (the duration of the experiment). Little or no protective action followed the use of unmedicated soap.

It is considered that the results recorded justify the belief that the generalized use of tetmosol soap in an infected community would reduce the incidence of scabies by sterilizing some existing cases and by destroying the infection in freshly invaded persons. Such generalized use, however, will only be possible if it is found that a high incidence of dermatitis does not follow prolonged use of the soap. We have shown that the incidence of dermatitis following the use of the soap for short periods is low, and that it was low also among a small number of people tested over a prolonged period; but no estimate can be made of the risk of dermatitis until an extensive trial with a large number of individuals has been carried out.

## REFERENCES

- Clayton, T. M. (1943). *British Medical Journal*, 1, 443.  
 Davey, T. H., Gordon, R. M., and Unsworth, K. (1944). *Ann. trop. Med. Parasitol.*, 38, 46.  
 Gordon, R. M., and Seaton, D. R. (1941). *Ann. trop. Med. Parasitol.*, 35, 247.  
 Jennings, S. (1942). *Vet. Rec.*, 54, 330.  
 Johnson, C. G. (1943). *J. roy. san. Inst.*, 63, 29.  
 Percival, G. H. (1942). *British Medical Journal*, 2, 451.

## THE CARRIER STATE IN SONNE DYSENTERY

BY

J. GORDON HAILWOOD, M.D., D.P.H.

Major, R.A.M.C.; Hygiene Specialist

Since the discovery of *B. dysenteriae* Sonne in 1915 accounts have been published of many epidemic outbreaks of Sonne dysentery, but rarely has the original carrier in any single outbreak been traced. In fact, Bloch (1938) states: "It is generally accepted that symptomless chronic carriers of bacillary dysentery are rare"; while Buckle (1938), in the course of an investigation of an outbreak of Sonne dysentery in a mental hospital, says: "Tracing the cause appeared a hopeless task. . . . Proved persistent carriers of this organism are apparently rare, and . . . little investigation has been done to elucidate this point."

The appearance of Sonne dysentery in the Army in many places throughout the country, and particularly the large outbreak in a regiment which I propose to describe in some detail, have led me to search the literature for recorded outbreaks of this disease, especially noting whether or not an original carrier was found in each outbreak. The following table covers most of the recorded outbreaks in this country. It is seen that in only one outbreak—that reported by Thornton and Darmady (1938)—was an original carrier found.

In view of these facts and the suggestions that chronic carriers of Sonne dysentery are rare, the severe outbreak which occurred in an Artillery regiment in July-Aug., 1943, is of

special interest, since a chronic symptomless carrier who worked in the cook-house was traced as the originator.

Author	Place	No. of Cases	No. of Cases Bacteriologically Positive	Cause	Remarks
Weisman (1927)	Glasgow	—	80	Milk	No carrier found
Laws (1936)	Mental hospital	113	75	No cause found	Suggested that mild or symptomless cases were missed and they spread the infection
Parry and Peters (1936)	Mental hospital, Bristol	32	9	" "	Case-to-case spread
Bloch (1938)	Institution, Glasgow	—	78	No evidence of spread by food, milk, or water	Origin not traced
Buckle (1938)	Mental hospital	115	74	No cause found	Six positives among staff, nurses, and porters, but not cooks
Savage (1938)	Somerset	130	?	Ice-cream	No carrier or specific source of infection ascertained
Thornton and Darmady (1938)	Mental colony	—	30	Two symptomless carriers—one a dish-washer	
Cruickshank and Swyer (1940)	—	32	29	No carrier found	Suggested case-to-case spread
Graham (1942)	School	52	Only 5 tested, who were positive	No carrier or infecting agent found	All kitchen staff examined, but negative
Irvine (1942)	Leicester village	73	17	No carrier found	Suggested case-to-case spread
Green and Macleod (1943)	Somerset town	About 400	?	Water	No carrier found. Eight water-works employees examined: all negative

## The Outbreak

An Artillery regiment, consisting of three batteries and with a total strength of about 900 men, was at a practice camp in Wales when an outbreak of diarrhoea occurred. This started about July 20, 1943, and appears to have been at its height about Aug. 1, but no examination of faeces was done until Aug. 3. However, from this date every soldier with a history of diarrhoea since the start of the outbreak had specimens of faeces examined. Those with a positive result were admitted to isolation hospital immediately, while negatives had further examinations of faeces until three specimens had been found negative. Altogether there were 292 cases of diarrhoea (32.5% of the total strength), of which 81 were positive for *B. dysenteriae* Sonne. It is probable that the infection had died out in many of the remaining 200-odd cases before the stools were examined, as the attack of diarrhoea in some cases had been two to three weeks previously. Treatment in isolation hospital with sulphaguanidine resulted in the rapid cure of all cases, including the carrier.

This outbreak occurred in what was virtually a closed community, since the camp was isolated and outside amenities were few. The water supply was satisfactory, and was regularly examined bacteriologically. The general lay-out of the camp and the sanitary arrangements were also satisfactory. There was no fly nuisance; food-storage facilities were good; and both larders and cook-houses were clean and well kept. Food for the whole camp was drawn from a single central store. There were four main cook-houses in the camp, one of which served the permanent staff of the camp, while the other three were staffed by and served the visiting regiment.

No cases arose among the permanent staff, and no evidence of diarrhoea was found among the cooks of the staff cook-house. Cases, however, occurred among men served from all the cook-houses used by the visiting regiment. All the cooks and orderlies in each cook-house were paraded and questioned carefully whether they had had diarrhoea during the last 12 months. Twelve gave a history of diarrhoea within the period of the outbreak, and, in addition, one in June, one in May, one in Feb., 1943, and one in Aug., 1942. These men were all excluded from the cook-house immediately and their stools

examined on six occasions before being considered negative and allowed to return to duty. Six positives were obtained among these men. All other cook-house personnel who denied a history of diarrhoea had three specimens of faeces examined, but were allowed to continue their work in the cook-house without interruption.

The exclusion of suspicious cooks from the cook-house was completed on Aug. 11; the last fresh case of enteritis occurred on Aug. 13, and I considered that by Aug. 20 the regiment could be considered free from infection. Owing, however, to the expected activities of this regiment, Higher Authority considered that the risk of another outbreak should be excluded with certainty, and eventually every man in the regiment who had not previously been examined, because he gave no history of diarrhoea, had two specimens of faeces tested. It is of interest that not a single further positive result was obtained.

### The Carrier

At least one Sonne-positive case was found among the personnel in each cook-house, but only one man whose history of diarrhoea was outside the limits of the incubation period. This was Gunner P., who gave the following history.

While stationed in Scotland in Aug., 1942, he had been admitted to a camp reception station with acute enteritis, pyrexia, colic, and frequent stools containing blood and mucus. He was in bed for about 7 days, but no investigation was carried out. In Nov. 1942, he was posted to this regiment, and in Feb., 1943, was employed in the sergeants' quarters. His duties included providing the sergeants with cups of tea, bread-and-butter, etc., at various times. At this period there was a mild outbreak of enteritis in the regiment—some 80 cases in all, of which the majority were sergeants. No investigation was carried out, however, and the outbreak apparently died down. For some months he was then employed on the guns, but on July 7 he was detailed for duty as orderly in one of the regimental cook-houses at the practice camp. His job was mainly cutting bread-and-butter. The first cases occurred about July 20, and were among the battery personnel served from this particular cook-house.

It is certain that in the course of his duties Gunner P. visited the other regimental cook-houses to lend or borrow on numerous occasions, and thus infection would be conveyed to food and personnel in them, with consequent spread of the epidemic to the remaining two batteries. It was equally certain, for administrative and other reasons, that he did not so visit the permanent staff cook-house. It has been noted that no cases occurred among the personnel served from there. This man had had no symptoms since his moderately severe attack 12 months previously, but his stool showed a heavy infection of *B. dysenteriae* Sonne.

### Comments

It is evident that Gunner P. was the carrier in this outbreak, since he was the only Sonne-positive found who had not had any symptoms within the limits of the epidemic. He had had, in fact, no symptoms whatsoever since his enteritis of 12 months previously, while his history was exceedingly suggestive and his work as a cutter of bread-and-butter was ideal for the spread of the organisms. There can be no doubt that here was an outbreak of Sonne dysentery spread by food—by far the commonest vehicle—infected by a chronic symptomless carrier of a year's duration.

I consider that symptomless carriers are responsible for many of the recently frequent outbreaks of Sonne dysentery in this country. However, I would suggest that they are only symptomless in that they have had no symptoms for, maybe, many months, but that with careful questioning a history of diarrhoea, or perhaps just "looseness of the bowels," at some time in the past will be obtained. This opinion is borne out by the fact that in the outbreak described above not a single positive stool was obtained from the remaining two-thirds of the regiment who were subsequently examined but who had given no history of illness previously. In other words, no positive case was found that did not give a history of diarrhoea at some time.

It is impossible to over-emphasize the importance of careful questioning of all persons connected with food preparation in any outbreak of dysentery; this, followed by the segregation of all those with a history of diarrhoea, however slight, will almost always put an end to the outbreak. Gardener (1929), when discussing asylum dysentery, stated that carriers are the main source of infection; while Hobbs and Allison (1942) have also

recently stressed the importance of carriers and ambulant cases in the spread of the disease. However, although the carrier state is generally admitted, only rarely has a single definite carrier been found in an epidemic of any size. Yet it is essential to isolate such a carrier before one can be satisfied that any such epidemic has been finally brought to an end. Milk, water, food, have all been involved in some or other outbreak, but often the human factor is neglected. The vehicle—and cold uncooked foods should always be primarily suspect—is a link in the chain which will, if carefully followed, bring the investigator to the human focus of the infection.

### Summary

An outbreak of Sonne dysentery in a virtually closed community is described.

It was discovered that a chronic symptomless carrier had spread the infection by food during his duties in the cook-house.

The removal of all infected cooks from the cook-house immediately stopped the outbreak.

The opinion is put forward that the so-called symptomless carrier of Sonne dysentery is common, but that a history of diarrhoea at some time in the past can usually be obtained.

I wish to thank Capt. C. E. Perry and Lieut. Madison, R.A.M.C., for their help at the scene of the epidemic; Dr. R. M. Fry of the E.P.H. Laboratory Service for his reports on numerous specimens; and the D.D.M.S., Western Command, for his permission to publish this account.

### REFERENCES

- Bloch, E. (1938) *British Medical Journal*, 1, 636.  
Buckle, D. (1938) *Lancet*, 2, 913.  
Cruckshank, R., and Sayer, R. (1949). *Ibid.*, 2, 803.  
Gardener, A. D. (1929). *System of Bacteriology*, 4, 244.  
Graham, J. R. (1942) *Lancet*, 2, 553.  
Green, C. A., and Macleod, M. C. (1943) *British Medical Journal*, 2, 259.  
Hobbs, B. C., and Allison, V. D. (1942). *E.P.H.S. Bulletin*, July.  
Irvine, E. D. (1942) *Med. Officer*, 67, 53.  
Laws, J. J. (1936) *Lancet*, 1, 192.  
Perry, R. H., and Peters, B. A. (1936). *Med. Officer*, 55, 203.  
Savage, W. (1935) *J. Hyg. Camb.* 38, 331.  
Thornton, L. H. D., and Darmady, E. M. (1938). *Lancet*, 1, 25.  
Wiseman, W. R. (1927). *Ibid.*, 1, 41.

## AN ANALYSIS OF COLLES'S FRACTURE

S. C. ROGERS, B.S., M.R.C.S.

Late Casualty House-surgeon, St. Mary's Hospital, Paddington

"No two Colles's fractures are alike."—SPEEO (1935).

At first when examining and reducing Colles's fractures this aphorism seemed too true. Later, recurring types were noted, and it was decided to review the radiographs of a series of fractures around the lower end of the radius seen at this hospital between Jan., 1942, and Oct., 1943.

Descriptions of the varieties of comminution of the lower radial fragment in Colles's fracture are absent from surgical textbooks and vague in works on orthopaedics. Comminuted forms are recognized by Platt (1932) and others, and a vertical posterior marginal crack involving the wrist-joint is described by Clayton and Edwards (1929).

Very divergent views on the cause of poor end-results are given. Platt (1935) and Taylor and Parsons (1938) stress the bad prognosis of coincident fractures of the base of the ulnar styloid and injuries to the triangular fibrocartilage, but do not think involvement of the ulnar notch of the radius important. Grasby and Trick (1929) find that imperfect reduction leads to osteo-arthritis of the inferior radio-ulnar joint. Clayton and Edwards (1929) and Bankart (1929) stress the reduction of backward rotation and Mayer (1939) of supination. Finally Lewis (1934) blames lack of co-operation by the patient in active exercises. Thus, given satisfactory reduction and its maintenance and the adequate supervision of active exercises, injuries to the base of the ulnar styloid and the triangular fibrocartilage appear to lead to most trouble. In this analysis Colles's fractures are divided into types with different degrees of damage and mechanisms. A short anatomical account of the radio-ulnar joint will enable the discussion to be followed more readily.

### Anatomy

The ulnar collateral ligament of the wrist is attached to the tip of the ulnar styloid process. The apex of the triangular

fibrocartilage of the inferior radio-ulnar joint is attached to the floor and walls of the small pit at the radial side of the base of the ulnar styloid. This fibrocartilage spreads out to a linear insertion along the edge of the ulnar notch of the radius, and its margins are prolonged into the loose anterior and posterior capsule of the radio-ulnar joint. Thus a fracture across the base of the ulnar styloid or the splitting off of the postero-medial corner of the lower end of the radius enables the main portion of the radius to displace the fibrocartilage without seriously injuring it.

### Analysis and Discussion

In all, 328 fractures around the lower end of the radius have been analysed; 13 epiphyseal injuries and the rare greenstick Colles's fracture have been included. The common greenstick fracture of the radius, fractures of the lower shaft of both forearm bones, and carpal fractures have been excluded.

The 219 Colles-type fractures fall into five groups with surprising clarity:

(A) 59 simple Colles's fractures—i.e., fractures not involving the radio-carpal articular surface, but often with fragments of the posterior cortex flaked off, usually including Lister's tubercle (see Fig. 1).

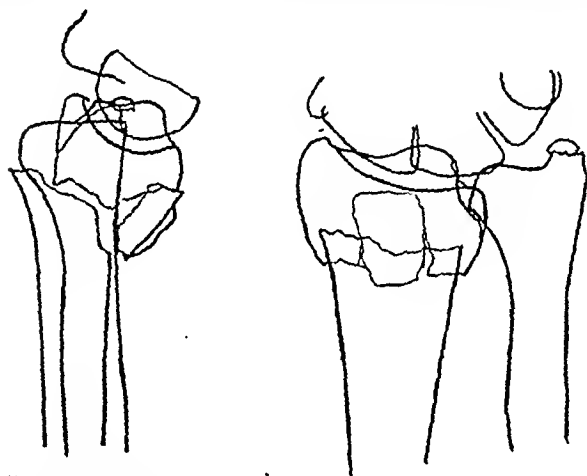


FIG. 1.—Simple Colles's fracture with severe displacement and shortening. Probable rupture of triangular fibrocartilage. Note tubercle of Lister in flake off posterior cortex. (Group A.)

(B) 108 fractures with an oblique postero-medial fragment containing part of the ulnar notch of the radius and so the attachment of the triangular fibrocartilage, and involving both radio-carpal and radio-ulnar joints (see Fig. 2).

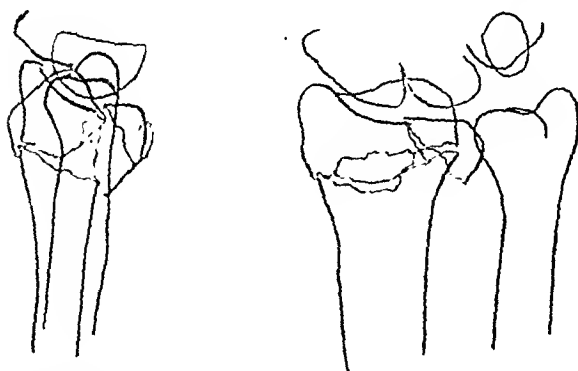


FIG. 2.—Colles's fracture with small postero-medial fragment. Medial displacement and shortening of this fragment suggests posterior subluxation of intact fibrocartilage. (Group B.)

(C) 39 "comminuted Colles's fractures" in which a fracture of the base of the radial styloid passes from the centre of the radio-carpal articular surface obliquely to the lateral surface of the radius, in association with the above postero-medial fragment (see Fig. 3).

(D) 11 fractures with a vertical fracture of the radial styloid, with or without a postero-medial fragment.

(E) 2 fractures with a transverse fracture of the base of the radial styloid passing from the articular surface directly laterally, without a postero-medial fragment.

The other 19 cases include 8 fractures of the styloids (2 ulnar and 6 radial), 5 marginal fractures of the radius, and 6 Smith's fractures.

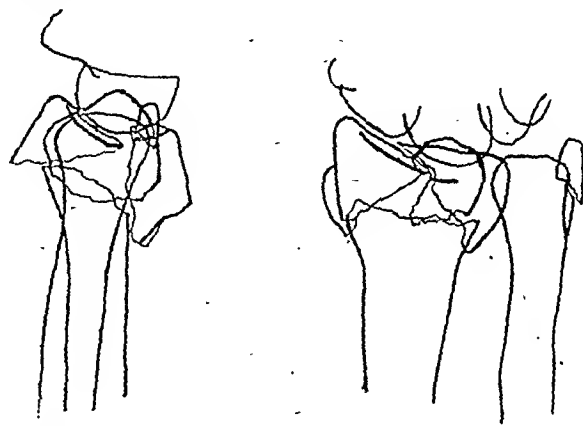


FIG. 3.—Comminuted Colles's fracture with oblique fracture of radial styloid and large postero-medial fragment. Note backward displacement of whole ulnar styloid and fibrocartilage. (Group C.)

A detailed analysis of the Colles's fractures according to the presence of shortening of the postero-medial corner of the radius, the type of fracture of the ulnar styloid, and the severity of the displacement of the main fragments, was made and on its results the following remarks are based.

Clayton and Edwards's (1929) observation that it is the long narrow type of ulnar styloid that breaks at its tip, whereas the short broad type is less often fractured, has been confirmed.

In general, basal fractures of the ulnar styloid are rare when displacement is minimal and frequent when severe, especially if shortening at the radio-ulnar joint is present. In fact, there are only 16 cases out of 219 in which the presence of shortening at the radio-ulnar joint without a basal fracture of the ulnar styloid suggests a rupture of the triangular fibrocartilage. A postero-medial fragment is present in all but one of these 16 cases, and in many the extreme medial displacement of this fragment suggests a posterior subluxation of the intact ligament rather than an actual rupture. This explains the rarity of instability of the radio-ulnar joint as a late sequela (Hyman and Martin, 1940), and the usual excellent return of pronation and supination.

Group B contains most of the more severe fractures and shows many basal fractures of the ulnar styloid. The postero-medial fragment varies in size from an apparent avulsion of the insertion of the radio-ulnar fibrocartilage to a fragment like the isolated posterior marginal fracture, and its vertical direction suggests that it is a compression fracture. In group C the bending force that produces the Colles's fracture is combined with a compression force directed backwards and laterally, splitting off the posterior and lateral portions of the articular surface and leaving an anterior marginal fragment which is sometimes rotated slightly forward (see Fig. 3). This compression and lateral displacement mechanism accounts for the frequency of shortening and of basal fractures of the ulnar styloid. Group D is small, and represents a compression fracture in which the force is directed almost vertically down the shaft of the radius. Group E combines the Colles with a transverse shearing fracture of the radial styloid—one of the chauffeurs' fractures.

All these types of secondary fracture may occur isolated, and similar comminutions may be seen in Smith's fractures.

### Reduction

A general method of reduction is described and discussed below. The strength of the manipulations should be varied with the exact displacement seen in antero-posterior and lateral radiographs.

Nitrous oxide anaesthesia is satisfactory provided a dry slab is prepared before reduction, that during plastering the slab is rendered almost dry, and that hot water is used. (This accelerates setting of the plaster.)

1. Strong steady traction on the hand in slight radial deviation obtains disimpaction, overcomes shortening at the radio-ulnar joint, and, if strong enough, secures anterior cortex-to-cortex apposition.
2. Strong traction in 30 degrees palmar flexion with direct pressure, by the chin if necessary, over the lower fragments corrects backward rotation without further trauma to the joint capsule.
3. Traction in ulnar deviation and pronation corrects radial deviation and supination.
4. Direct antero-posterior and lateral compression moulds the fragments.

This method is similar to many others, but I would stress that, unless disimpaction is carried out by strong traction in radial deviation, shortening at the radio-ulnar joint and posterior subluxation of the triangular fibrocartilage may persist.

The method of Sir Robert Jones (or, rather, of Hugh Owen Thomas—see Parker, 1929) is satisfactory if there is no shortening or gross comminution, but a generally applicable method is preferred.

#### Immobilization and After-treatment

Reduction is confirmed and its stability tested. The arm is held in moderate traction in the mid-pronated position with considerable ulnar deviation and no palmar flexion. The thumb is opposed, abducted, and flexed to meet the flexed index finger. A 4-circle plaster back slab is applied gripping the anterior surfaces of radius and ulna and the dorsal surface of the first metacarpal, and taking a long grip of the upper end of the ulna. This position helps to maintain the full length of the radius. The slab is secured with a dry cotton bandage. No moulding is performed if the fracture is stable, but if unstable—as, rarely, it is—careful moulding to the anterior radial concavity is essential.

Reduction is checked radiographically, and graduated and vigorous active exercises to fingers, elbow, and shoulder are started immediately under supervision. A high sling is worn for three or four days. The plaster is removed after five weeks and the exercises are intensified. The patient usually returns to light clerical work after one week (in plaster), to light manual work after seven weeks, and to heavy work after about nine weeks. He is discharged when his range of movement is approaching that of the normal side and he has been doing his usual work without complaint for at least a week.

It is hoped to discuss in detail the results of a smaller series later.

#### Summary

238 fractures about the lower end of the radius have been analysed and shown to fall into certain definite groups. Their mechanisms have been discussed and their treatment outlined.

I am much indebted to Mr. V. H. Ellis, honorary orthopaedic surgeon to St. Mary's Hospital, for his encouragement and helpful criticism; and to my fellow casualty house-surgeons for their co-operation and stimulation.

#### REFERENCES

- Bankart, A. S. B. (1929). *British Medical Journal*, 1, 491.  
 Clayton, E. B., and Edwards, H. (1929). *Ibid.*, 1, 61.  
 Colles, A. (1814). *Edinb. med. surg. J.*, 10, 182.  
 Grasby, E. D., and Trick, S. R. (1929). *British Medical Journal*, 1, 391.  
 Hyman, G., and Martin, F. R. R. (1940). *Brit. J. Surg.*, 27, 481.  
 Lewis, K. M. (1934). *Ann. Surg.*, 99, 510.  
 Mayer, J. H. (1939). *British Medical Journal*, 1, 1197.  
 Parker, R. (1929). *Ibid.*, 1, 705.  
 Platt, H. (1932). *Ibid.*, 2, 298.  
 — (1935). *Surg. Gynec. Obstet.*, 60, 542.  
 Speed, K. (1935). *Fractures and Dislocations*, H. Kimpton, London.  
 Taylor, G. W., and Parsons, C. L. (1938). *Surg. Gynec. Obstet.*, 67, 24.

A message from Washington announces the appointment of Dr. Wilbur A. Sawyer, of New York, as Director of Health of the United Nations Relief and Rehabilitation Administration. He will be assigned to Washington and will be in charge of the Health Division of UNRRA and be responsible for planning and directing health and medical activities. His duties will require frequent visits abroad to the regional offices and field work. Dr. Sawyer has had long experience in international health activities through his connexion with the Rockefeller Foundation's International Health Division, of which he has been director for nine years. During his service with the Rockefeller Foundation he directed a hookworm campaign in Australia, made investigations of yellow fever in West Africa, carried on research in New York that revealed a method of vaccinating against yellow fever, and negotiated and planned co-operative projects with the health authorities of many countries of both hemispheres.

## AN OUTBREAK OF PUERPERAL SEPSIS DUE TO A SINGLE TYPE OF HAEMOLYTIC STREPTOCOCCUS

### ITS INVESTIGATION AND REMEDY

BY

MEAVE KENNY, M.R.C.O.G.

AND

MARY BARBER, M.D.

(From the Departments of Obstetrics and Pathology of the British Postgraduate Medical School, Hammersmith Hospital)

From 1935, in the obstetric unit of the British Postgraduate Medical School, a carefully conceived and operated routine has obtained good results in the prevention of epidemics of puerperal sepsis. Among 12,283 deliveries, only 19 isolated cases of haemolytic streptococcal infection of the genital tract have occurred, and none of these could be traced to respiratory tract infection of attendants. In 1938 and 1939 not one occurred. One woman has died of puerperal sepsis since the founding of the unit—a non-haemolytic streptococcal peritonitis developing after Caesarean section for placenta praevia in an emergency case which had been examined vaginally by outside attendants; and one has died of lobar pneumonia complicating localized uterine non-haemolytic streptococcal infection.

#### Preventive Routine

Booked cases without septic foci and with intact membranes are admitted in labour to a "clean" suite (D 6), and after delivery are drafted to "clean" lying-in wards (D 3 and D 5). These wards are made up of several 4-bed units. Unbooked cases without septic foci and booked cases with ruptured membranes are delivered and spend the lying-in period in a "suspect" suite (D 4). Vaginal swabs of all such patients are sent for routine bacteriological investigation, and pyrexial cases are removed from this and the "clean" wards to the isolation block. All cases found to have respiratory tract or other infection are admitted, delivered, and nursed in the isolation block of 10 single-bed rooms and attached labour theatre. These cases, too, have bacteriological investigation of the genital and other tracts performed as a routine measure, whether they are febrile or not.

Each suite has a separate nursing staff; the isolation block has its own house-surgeon, who does not enter the other suites. The visiting and resident obstetricians change their overalls before entering each ward and wear masks covering nose and mouth when in the isolation block, when examining women in labour, and in the delivery theatres. All students and members of the staff submit to a bacteriological investigation of the respiratory tract before joining the unit and on return from holiday. Respiratory tract or other infections bar entrance to the unit pending a bacteriological report on the nature of the infection.

Each patient when admitted in labour has a shower-bath and, after shaving, has the vulva and surroundings painted four-hourly with dettol 30% cream until delivery has taken place. In addition, women in the isolation block with upper respiratory tract infections have their hands anointed with the cream. Dettol cream is also used as a lubricant for pelvic examinations and instrumental deliveries; dettol 10% lotion is employed for swabbing the vulva in the early puerperium.

The following is a report of a recent epidemic of haemolytic streptococcal puerperal sepsis that overleaped these precautions. Its investigation and remedy.

#### Case Records

Case 1.—On Jan. 10, 1944, Mrs. E., primipara, was admitted in the first stage of labour to the clean suite D 6. She was delivered 54 hours later by Sister M. and a student and sent on to lying-in ward D 5. On the 12th her temperature rose to 103° F. She was at once transferred to the isolation block. Bacteriological investigation of her lochia showing haemolytic streptococci, she was removed to the North-Western Fever Hospital, and recovered under sulphonamide therapy, as did all the other women involved in the outbreak.



**Case 2.**—On Jan. 13 Mrs. T., primigravida, with a slight cold, was taken in error to the receiving room of D 6, but was transferred very shortly to the "suspect" D 4, as the isolation block was fully occupied that night. Five hours later she was delivered under the close supervision of Sister M. A superficial perineal tear was stitched with silkworm-gut. She was kept in lying-in ward D 4. On the 17th she developed a temperature of 99.4° F.; the routine vaginal swab taken of all patients in this suite showed in her case haemolytic streptococci.

**Case 3.**—On Jan. 14 Mrs. R., primigravida, after 6 hours' labour in D 6, was delivered by Sister M. She, too, had a small tear stitched with silkworm-gut. She was sent to lying-in ward D 3; on the 17th she had a temperature of 102° F. Haemolytic streptococci were cultured from the vagina.

**Case 4.**—On Jan. 17 Mrs. H., primigravida, was delivered in D 6, after a 10-hours stay, by Sister M. On the 20th her temperature was 102° F. in lying-in ward D 5 (in another than the 4-bed room once occupied by Case 1). Haemolytic streptococci were found in her vagina.

**Case 5.**—On Jan. 18 Mrs. W., primigravida, was delivered in D 6, after 11 hours in labour there, by Sister M. and had a first-degree tear stitched. On the 19th her temperature was 99.6° F., and haemolytic streptococci were cultured from her genital tract. She manifested the infection while in lying-in ward D 3, though not in the same 4-bed room as Case 3.

**Case 6.**—On Jan. 23 Mrs. C., primigravida, was delivered in D 6 by Nurse B., after a stay of 8 hours. Dr. P. sutured a second-degree tear and cared for her during a post-partum haemorrhage. While in ward D 3 her temperature was 101° F. on the 25th, and haemolytic streptococci were recovered from the vagina. This is the only infected woman who was not delivered by Sister M.

**Case 7.**—On Jan. 25 Mrs. D., primigravida, was admitted from the ante-natal clinic at term with hypertension and albuminuria. She went into labour in the ante-natal ward and was sent up to the delivery room of D 6, not entering the receiving room there at all. An hour and a half later she was delivered by Sister M., and a tear was sutured by Dr. P. On the 27th, in lying-in ward D 4, she developed a temperature of 101° F., due to a haemolytic streptococcal infection of the genital tract.

### Investigation and Remedy

The bacteriological report on the vaginal swab of Case 1 was known on Jan. 14, and at once nose and throat swabs were taken of the nursing, domestic, and medical staffs of the labour and lying-in wards concerned, and vaginal and nose and throat swabs of the three puerperal women who had shared a 4-bed lying-in ward with Case 1. The nose and throat of the patient herself were also examined. Haemolytic streptococci were not recovered from any of these sites. When the other cases appeared, similar investigations were made, and all proved fruitless. Repeated cultures from the respiratory tract of Sister M. were negative. Late in the course of the epidemic a few colonies of haemolytic streptococci were recovered from the throats of a member of the consultant medical staff, Dr. K., who had not attended any of the affected women, but who had visited all the wards involved: of a nurse who worked in lying-in ward D 3; and of a ward maid of D 3. The dust of the receiving and labour wards was negative; a few colonies of haemolytic streptococci were found in an office attached to D 6 which is used by the medical and nursing staffs. This room was fumigated with formalin vapour at once.

Diligent search for the source of the epidemic went on. The bed-pan- and bidet-sterilizing apparatus in the labour ward as proved relatively effective only, for a test implant of streptococci survived, although streptococci were not found on any utensils that had already been "sterilized" and held ready for use. The apparatus was overhauled, and the steam pressure, upon which its efficiency depends, has been adjusted. It is now satisfactory.

However, an abundant growth of haemolytic streptococci was recovered from the under-rim of the lavatory seat in the receiving room of D 6, through which all but two of the infected women had passed on admission. The lavatory seat is two feet away from the porcelain slab on which all patients admitted to D 6 receive a shower-bath. It was cleaned daily by a maid, using Jeyes' fluid; the positive swab was obtained shortly after such a cleaning had been performed and before its next use. On the discovery of its contamination the room was disinfected with formalin vapour. There have not been any infections since, and the furniture of the room is now

cleansed with pure dettol after each time of use. To strengthen the barrier, each woman now admitted in labour has the vulva painted with dettol cream *before* the parts are shaved or the bath given or the lavatory visited, as well as thereafter.

### Bacteriological Report

In searching for a source of infection for these cases of puerperal sepsis 350 specimens were examined for the presence of haemolytic streptococci. These included nose and throat swabs of staff; nose, throat, and vaginal swabs of contact patients; samples of dust from various sources; plates exposed to the air in labour wards; and swabs from lavatory seats and bed-pans. Lancefield A haemolytic streptococci were isolated from 5 of these specimens—three throat swabs of members of the staff, the lavatory seat in D 6 receiving room, and the dust in the office of this suite. The number of haemolytic streptococci isolated from the lavatory seat was overwhelming. Lancefield G haemolytic streptococci were isolated three times—from the throat of a nurse and from the vagina of two apyrexial patients. One patient had Lancefield C streptococci in the throat.

All the Lancefield A haemolytic streptococci were submitted for typing to Dr. Dora Colebrook and Mr. Maxted, of the Emergency Public Health Laboratory, Ravenscourt Square. We have to thank them both for this co-operation, and Dr. Dora Colebrook for most helpful comment. They reported that the seven streptococci isolated from the cases of puerperal fever all belonged to the same type, provisionally diagnosed as 4/24. Of the other five Lancefield A haemolytic streptococci, the two isolated respectively from the lavatory seat in D 6 and the dust in D 6 office were identical in their reaction with those isolated from the infected women. The streptococci recovered from the throats of members of the staff (Dr. K., a nurse, and a ward maid from D 3) were of different types and not related to the epidemic. None of the three cases in which operative delivery was performed by Dr. K. about this time were infected by the strain she carried, nor was the type carried in the throat of nurse and maid conveyed to any patient in their ward.

### Discussion

The cause of the epidemic is not quite clear. Although the lavatory seat in D 6 receiving room was heavily contaminated with the causal organism, it is difficult to imagine that direct spread took place from seat to patient, and in two cases (Case 2, delivered in D 4 after only a few minutes' stay in D 6; and Case 7, conveyed from the ante-natal ward straight to the labour room of D 6) this was not even a possibility. Unfortunately, immediately this bacteriological report was known the receiving room was closed and fumigated with formalin vapour, so that further investigation of its flora could not be carried out. It is very probable, in view of the gross contamination of the lavatory seat, that other objects in the room, and even the air, contained streptococci. After fumigation streptococci were not isolated from any part of the room. The swab from the lavatory seat was taken from underneath the "plastic" rim, and, although the seat is cleaned daily with an antiseptic, it is possible that the lower surface had been neglected, so that enough organic material remained to permit growth of organisms. In this case it might have acted as a reservoir of streptococci, contaminating the receiving ward and possibly the gowns of patients and nurses. The strongest piece of evidence pointing to this source of infection as the cause of the epidemic is the fact that after fumigation of this ward no further cases occurred. How the seat originally became contaminated is a matter for speculation; it is quite conceivable that it took place through Mrs. E. (Case 1) or an unknown non-febrile carrier before her.

There is no other strong link connecting all the cases. During the two weeks of the epidemic 71 women were delivered in the unit, 28 of these at night. Of the 28 night cases 11 were delivered by Sister M. and 6 became infected. Two of these had not used the contaminated seat. The remaining case was delivered by day and by another hand. She had used the contaminated seat.

The apparatus for sterilizing bed-pans was not entirely satisfactory at the time. It is possible that the spread of infection was aided by this, although once again it is difficult to believe

that direct spread from bed-pans was the cause of the epidemic, as pathogenic organisms were not recovered from any in use.

### Summary

An outbreak of haemolytic streptococcal infection among puerperal women is described. All the 7 cases were infected with the same type of streptococcus. It is suggested that the infection was spread, directly or indirectly, from a lavatory seat in the receiving ward.

## NARCO-ANALYSIS WITH NITROUS OXIDE

BY

C. H. ROGERSON, M.D., M.R.C.P., D.P.M.

Medical Director, Cassel Hospital

Since anaesthetics were first used in surgery it has been common knowledge that during the periods of induction and recovery the tongue of the patient tends to be loosened and expressions are uttered which would ordinarily be repressed. This observation merely bears witness to the truth of the saying, *In vino veritas*. During recent years psychiatrists have made use of this phase of lowered self-criticism and self-control for various purposes. The anaesthetic agents that have been chiefly employed in psychiatry have been the barbiturate group of basal narcotics.

### Narco-analysis in the Twilight State

I first became interested in the possible utilization of the twilight state produced by these agents, in suitable dosage, by the accidental observation at Guy's Hospital that it was exceptionally easy to convey suggestion to patients who were recovering from avertin anaesthesia. The matter was there subsequently pursued with greater precision by Campbell (1938), who recorded a series of experiments using intravenous cyan (soluble hexobarbitone) and summarized the literature then available. Horsley (1936, 1943) has carried on a far wider range of investigations. He has coined the convenient term "narco-analysis" and has been chiefly responsible for the present widespread use of the method.

As with all new techniques, some exaggerated claims have been made for its usefulness. However, it appears to have a definite role in the treatment of certain psychiatric disorders, and has been employed at the Cassel Hospital since 1937.

The effect of the intravenous injection of a soluble barbiturate seems to be to produce a state of temporarily reduced self-criticism in which suggestions are more readily accepted, and in which painful or repressed ideas come more readily to consciousness. This effect is closely comparable to that which may be produced by light hypnosis, but it is achieved without the two main disadvantages of hypnosis—namely, a semi-magical atmosphere and the risk of the development of an excessive, often sexually coloured, dependence upon the hypnotist.

In the treatment of neurosis the method is useful in two types of problem: first, in conversion hysteria, particularly in hysterical fugues, for the rapid removal of symptoms or recovery of memory by suggestion and persuasion under narcosis; secondly, in anxiety neuroses and other disorders in which fairly deep psychological analysis is required, for the rapid access, by free association under narcosis, to repressed ideas and complexes which may lie at the root of the condition. In both types of disorder the use of the drug may produce dramatic results ranging from the vivid emotional recollection of some recent terrifying incident to the recapture of some long-forgotten childhood fantasy.

The method is essentially and principally a time-saving one. It is doubtful whether, in the neuroses at least, results are obtained which could not ultimately have been gained without its use. However, in psychiatry particularly, any method of investigation or treatment which saves the time of physician or patient is of the utmost practical value.

The disadvantages of narco-analysis by means of barbiturates are twofold. There is first the objection, which has recently been brought more clearly to the attention of the medical profession, that the intravenous injection of barbiturate drugs, particularly when it may have to be repeated many times, is not without hazards. This links up with the second objection

—namely, that the method is not as time-saving as one would like. In order to carry it out with adequate safeguards for the patient an assistant is necessary; the patient must be prepared as if for a short general anaesthetic, and resuscitation materials must be at hand. This preparation must be repeated for each injection, although in some cases the progress made at a single session may be very limited.

### The Nitrous Oxide Method

During the past 12 months a way has been found of overcoming these objections by the substitution of inhaled nitrous oxide for intravenous barbiturates as the anaesthetic agent. Experiments with nitrous oxide were begun because many patients and normal individuals spoke of the remarkable feeling of release, of freedom, and of power which they experienced under gas. Such feelings generally point to just that reduction of the normal critical faculties which it is the aim of narco-analysis to achieve.

It was found that a slow induction of analgesia, using a mixture of gas and air gave the best results, and for this purpose the Minnitt obstetrical gas-air-analgesia apparatus proved ideal. This has a number of advantages over the ordinary gas-anaesthesia apparatus. First, the flow of gas is regulated by the patient's breathing, so that there is no waste. Secondly, the patient himself controls his intake of gas and can stop at any moment; fear is thus almost entirely eliminated. Lastly, the apparatus is simple and requires almost no manipulation by the psychiatrist.

The proportion of gas to air delivered by the machine in normal usage is about 45%. This is enough for many patients, but can be increased if necessary by closing one or two of the air-inlet holes with the fingers. With this method it is not advantageous to render the patient unconscious, as it wastes time to do so and is apt to diminish the co-operation of the patient. The best technique appears to be to allow the patient to breathe the mixture until restless movements and some change in the rhythm of respiration herald the approach of loss of consciousness. At this point the patient's own grip on the mask and on the air-hole at the back of it relaxes (as indeed with this apparatus it is intended that if shall do), and the inhalation of gas ceases. The subsequent twilight state, which lasts for a minute or two and which is very easily prolonged by suggestion, is utilized for narco-analysis. About 20 breaths of the mixture usually suffice, and the experiment can be repeated as soon as the effect has worn off.

In practice the method and its intentions are explained to the patient and the use of the apparatus is demonstrated to him. He is shown how the whole process is under his own control, and this at once allays apprehension. He is invited to have a "trial run" without any attempt at psychotherapeutic intervention. After this he is ready to begin.

At first, during the whole of the induction period, gentle suggestions are given that he is becoming relaxed, that painful ideas will come more readily to his mind, and that his thoughts are flowing easily and without restraint. Directly he drops the mask he is urged to express whatever comes into his mind. In the case of a hysterical fugue he is told that he will relive the forgotten incidents, just as would be done under hypnosis or narco-analysis with a barbiturate.

In our experience abreaction and the recall of repressed memories are as vivid and as readily obtained as with any other method, and the time and preparation saved are of course very great. The method has been employed with a considerable number of patients during the past year, of which the two following are representative examples.

### Illustrative Cases

**Case 1.**—A male aged 19; admitted July, 1943. Reason for referral: loss of memory; periodic fugue states in which he wandered away from home after an emotional crisis, usually in relation to some delinquent behaviour. A normal child until the age of 5, when he had rheumatic chorea and his parents were told that he must not be crossed in anything. Subsequently avoided responsibility and punishment because of his "delicacy." First wandered away from school at 14 in a fugue following some minor difficulties there. Had subsequent fugues after failing an examination and after being found out in a series of lies. Three months before admission, after a row with his grandfather, who took a stern and realistic view

of his behaviour, he fell downstairs and was picked up with complete amnesia for the whole of his past life. Concussion was at first diagnosed, but the picture was soon seen to be essentially a hysterical one, and he was admitted to hospital after attempts at recovery of memory by persuasion had failed. Administration of nitrous oxide, using the technique described, produced a dramatic return of memory for the events preceding the fall and for the main events of his past life. Subsequent administration enabled him to recall and relive his activities during previous fugue states, which he claimed had never been recollected. Psychotherapy was then continued along orthodox lines.

Such dramatic recollections and abstractions are very pleasing at first sight, but they do not constitute the principal justification for the use of this method. An experienced and sympathetic psychiatrist can usually resolve a hysterical amnesia of this type by almost any method provided that he has won the confidence of the patient. Nitrous oxide merely provides a simple, quick, and efficient method which may be preferred on this account. Its usefulness is, however, most apparent in cases requiring difficult psychological analysis, where the time factor is even more important and where a rapid resolution of repressed conflicts is very desirable.

The second case belongs to this type. This patient presented a typical severe anxiety neurosis.

**Case 2.**—Mrs. A., aged 32; admitted May, 1943. Reason for referral: feelings of exhaustion and weakness; loss of weight; worry over bowels and food. The symptoms had been present to some extent for about 10 years. The immediate reason for their onset seemed simple and straightforward. She was the child of a financially poor family, and after winning a series of scholarships had had a brilliant undergraduate career at a provincial university and had come with a research scholarship to Oxford. There she found herself, both socially and intellectually, in much deeper waters, and since she had always been used to unquestioned leadership at school and at her own university she reacted with anxiety symptoms. She subsequently married a professor in her own field of work and had three children in very rapid succession. She found difficulty in living up to her husband's family, and the stresses to which she was subjected increased the anxiety symptoms so that a typical vicious circle of anxiety was created. Such a problem is often fairly readily resolved by superficial analysis combined with explanation, persuasion, and re-education. In this case, however, a deeper and much more complex set of factors were speedily uncovered. Behind the difficulties in her married life there lay a pathological emotional relationship with her father, the solution of which was essential to her recovery. Analysis was at first slow and difficult, but the repeated use of nitrous oxide inhalations produced a rapid flow of forgotten associations of a highly painful sexual character. The patient herself repeatedly asked for the apparatus during the process of free association, and learned how to use it without assistance or advice during difficult periods in the treatment. In this fashion a course of analytical psychotherapy which in the ordinary way would certainly have lasted a year was successfully concluded in six months, and the patient was then able to return home.

#### Comment

It seems certain, from our experience, that other methods of narco-analysis could not have achieved similar results without a far greater expenditure of time for therapist and patient. Repeated sessions under narcosis were necessary, and would have been necessary whatever narcotic was employed. One can resolve a hysterical amnesia or obtain an abstraction to a particular traumatic event in one session, but one cannot unravel the trend of events, often spread over a number of years, which go to the evolution of a problem of this type. In such a case the availability of narcosis "on tap" in the consulting-room, ready to be used at any moment in the course of analysis, is a very great advantage. Patients themselves express a strong preference for the nitrous oxide technique, and, where both have been used in a single case, access to hidden mental conflicts is fully as effective with gas as it is with a barbiturate.

#### Summary

The value and limitations of the method of narco-analysis in psychotherapy are briefly discussed. The intravenous injection of a barbiturate has been the method generally employed. Nitrous oxide inhalation is claimed to be fully as effective for this purpose; it is quicker, simpler, and safer, and can be used in the consulting-room at any time during the course of psychiatric treatment.

#### REFERENCES

- Campbell, A. M. G. (1938). *Guy's Hosp. Rep.*, 88, 185.  
Horsley, J. S. (1936). *Lancet*, i, 55.  
— (1943). *Narco-analysis*, Oxford Medical Publications, London.

## Medical Memoranda

### Large Goitre in a Child of 10

The following case history, with a photograph of the patient, may be considered worth publishing.

A girl aged 10, of miserably poor parents from Abu Tig, in Upper Egypt, came to this hospital in November, 1943. She had a history of a gradual enlargement of the neck, and general ill-health, of four years' duration. There was no complaint of dyspnoea or dysphagia.

On examination the child was seen to be wizened, anaemic, and poorly developed. Though alleged to be 10 years old she weighed only 43 lb., the average weight of a child of 6. There was a large, somewhat nodular, fairly firm bilobed mass, obviously a goitre, extending from mandible to manubrium and well beyond the sides of the neck (see photograph). The tumour was freely movable on manipulation and deglutition, and there was no stridor. A number of enlarged subcutaneous veins were observed moving in different directions over the tumour. The circumference of the neck and tumour varied from 18 to 20 inches. The child was found to be suffering from ankylostomiasis, as is usual with some 90% of Egyptian "fellahin." Her haemoglobin was only 60%, and so the ankylostomiasis and anaemia were treated before operation. She also had some dermatitis over the tumour and chest, which can be noted in the photograph; this responded quickly to simple ointments. There were no signs of thyrotoxicosis.

**Operation.**—As there were no facilities for intratracheal anaesthesia the patient was given 2 drachms of paraldehyde per rectum one hour and 1/200 gr. of atropine half an hour before operation. Only a very small amount of open ether was necessary after this premedication, and there was no anxiety over the airway throughout the operation. The usual "collar" incision was employed, and all but a small portion of the thyroid mass was excised. There was no difficulty apart from the number and size of the vessels, and haemorrhage was minimal. A small drain was inserted through a stab wound below the incision, being removed after 48 hours. Convalescence was rapid and uneventful, and the father insisted on removing the child some three weeks after the operation, before any great improvement in the general condition could be expected.

**Examination of the Tumour.**—The growth was in two parts, corresponding to the right and left lobes of the thyroid gland and parts of the isthmus. In appearance it was similar to normal thyroid tissue, but with numerous cysts, varying in size and filled with dark viscid fluid. The right-hand portion measured 6 by 2½ by 2½ in., and the left portion 5 by 2½ by 2½ in. The microscopical report stated, "The appearances are those of a papillary adenoma of the thyroid gland."

My reasons for reporting this case are the large size of the goitre, the comparative brevity of the history, and the youth of the patient. I am indebted to the pathologist and the photographer for their help.

C.M.S. Hospital, Old Cairo.

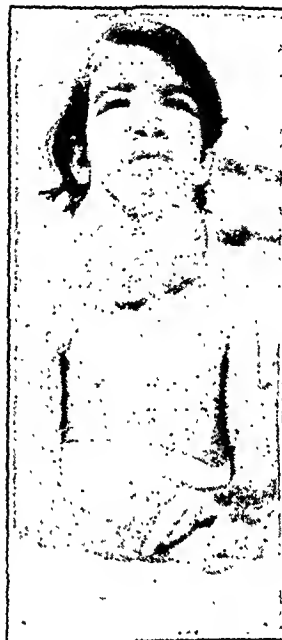
E. N. CALLUM, F.R.C.S.Ed.

### Varicella and Herpes Zoster: An Experiment

Observations, both clinical and experimental, have repeatedly been made which suggest the existence of a close relationship between the aetiological agents of varicella and herpes zoster. In view of this the following experiment was carried out to find whether convalescent herpes zoster serum would be effective in preventing varicella in varicella contacts. The scale of the experiment was small, but the findings are perhaps suggestive enough to justify publication.

Blood was taken from two herpes zoster patients during the second week after appearance of the eruption. After clotting, the serum was put up in ampoules and stored at a temperature of 4°C. till an opportunity arose for its use (about two months).

On May 31, 1942, varicella developed in a child of 6 years in one of the children's wards in this hospital. Of the other 19 children in the ward, 6 had a previous history of varicella. Of the 13 who had not previously had varicella, 7 were given an



intramuscular injection of 20 c.cm. of convalescent herpes zoster serum on the day after the case arose; the other 6 were used as controls. (Case D. R., with no previous history of varicella, was admitted to the ward in error on June 21. He was given 20 c.cm. of the serum intramuscularly next day.) The results of the experiment are set out in the Table

### Table of Results

Original Case	Age (Years)	Date Serum Given	Date of Varicella	No. of Recurrences
A. O. .. ..	6	—	31/5/42	—
<i>Previous history of varicella—no serum given</i>				
V. C. .. ..	4	—	15/6/42	50
K. E. .. ..	3	—	16/6/42	51
H. P. .. ..	3	—	—	—
M. C. .. ..	2	—	—	—
V. H. .. ..	2½	—	—	—
S. T. .. ..	6	—	—	—
<i>No previous history of varicella—no serum given</i>				
J. A. .. ..	1½	—	23/6/42	100
L. C. .. ..	2	—	12/6/42	100
R. H. .. ..	6	—	—	—
A. C. .. ..	5½	—	15/6/42	63
M. W. .. ..	2	—	19/6/42	106
L. W. .. ..	3	—	—	—
<i>No previous history of varicella—serum given</i>				
J. Y. .. ..	3	16/42	20/6/42	—
P. M. .. ..	11	16/42	—	—
J. D. .. ..	4½	16/42	—	—
D. L. .. ..	2	16/42	—	—
V. W. .. ..	5½	16/42	—	—
C. E. .. ..	2	16/42	—	—
I. M. .. ..	1	16/42	—	—
D. R. .. ..	3	22/6/42	—	—

All the children (except one, J. A.) who subsequently developed varicella were photographed after cropping had ceased, the lesions having been painted with gentian violet to improve visibility. The lesions (except scalp lesions) were counted and the numbers are shown in the Table. It is interesting that the one child (J. Y.) who had no previous history of varicella, and was given serum and developed the disease, was only very mildly affected.

I wish to thank the Medical Director for permission to publish this report.

A. W. ABRAMSON, M.R.C.P. D.C.H.  
A.M.O., West Middlesex County Hospital

## Two Cases of Subcutaneous Rupture of Jejunum : Recovery

The following case records are thought to be interesting enough to merit publication.

### Case 1

A girl aged 11 was knocked down on the evening of May 30, 1940, by a barrow, the handle of which had been thrust against the abdominal wall in front. She complained of abdominal pain which had come on immediately; afterwards she had vomited. When seen the next day the abdomen moved poorly on respiration, and both recti were rigid, with tenderness especially in the lower halves. The child was conscious and did not seem to be suffering from shock. The pulse was rather rapid (120) and slightly irregular, the temperature normal, and respiration 24. Nothing unusual was found in the urine.

On the evening of the history and the clinical signs operation was decided on without further delay—24 hours after the accident it was performed under general anaesthesia consisting of gas-and-oxygen and minimal ether (Dr P. Singer). There was some turbid fluid but no free blood in the peritoneal cavity. A transverse tear involving half the circumference of the gut was found in the jejunum 10 in. distant from the ligament of Treitz; the neighbouring peritonaeum was soiled with flaky exudate indicative of incipient peritonitis. The rent was sutured, and small abrasions situated over the down in the small intestine, together with one on the wall of the transverse colon, were peritonized. The abdominal wall was then closed and a suprapubic drain inserted. The pulse was rapid (150) to 102<sup>b</sup> for 6 days after the operation. The pulse was rapid (150) to 102<sup>b</sup>, and then gradually subsided. Both wounds discharged for 4 days, and there was some post-operative bronchitis. An appropriate dose of sulphates was given intramuscularly at operation and repeated in two days; this was followed by a course of sulphanilamide rectally and by mouth. Graduated feeding by the mouth replaced rectal salines as the condition improved, and was well tolerated. No abdominal distension occurred, and 8 days after operation the child was taking light diet well.

## CASE II

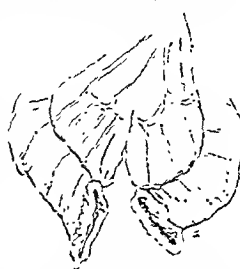

On Dec. 28, 1943, a man aged 22, while attending to a "shaung" machine, was caught between the iron plate and the machine by a double impact which hit him in the back. After the blow he suffered intense abdominal pain, central in position, constant but eased by "stretching" out. There was no vomiting and the spine and skin over the back (where he was hit) appeared normal. After the accident he walked 30 yards to a shelter; at no time did he lose consciousness. During conveyance to hospital by ambulance he noticed pain in the left shoulder for the first time. On admission he

was obviously distressed and in pain, but was only slightly shocked: his face was ashy, cyanosed and respiration was laboured. There was generalized abdominal rigidity on examination, with maximum tenderness in the left upper quadrant, the abdomen in this area the skin was marked by superficial abrasions. The pulse was 64, temperature 97.8°, respiration 20, and blood pressure 120/80. The urine was clear. The diagnosis seemed to rest between ruptured intestine and ruptured spleen.

The abdomen was opened by a left upper paramedian incision. 2½ hours after the accident, under general anaesthesia, using cyclopropane gas, and oxygen through an endotracheal tube by the closed-circuit technique (Dr. D. M. M. Carr). When the peritoneum was incised free blood issued from the peritoneal cavity. The spleen was palpated and found to be unharmed. The intestine was then searched, starting from above, and at a point 12 in. from the duodeno-jejunal flexure the jejunum was seen to be completely torn across, its edges contused, somewhat swollen, and everted. The lumen appeared empty, and except for blood in the neighbourhood there was little soiling of the peritoneum. The mesentery was only slightly torn and the vessels were scarcely harmed (see Fig.).

The open ends of the gut were ligated and invaginated, and a lateral anastomosis was then performed. The mesentery came together well, and was left unsutured. Sulphacetamide (albucid) was applied to the suture line and the abdomen was closed without drainage. Anaesthesia was smooth, and the patient's condition was satisfactory throughout; consciousness was regained in room.

Post-operative intravenous serum given. Stomach suction was maintained by mouth began on the second day—first clear fluids, then opaque fluids (fifth day), and on the eighth soft solids. The pulse, though of good volume, remained around 130/140 for two days, dropped to 100 in the next two days, and then returned to normal. The wound healed well. There were no chest or other complications.



COMMENT

As a rule this injury is said to be the result of a sharp impact, crushing the intestine against the vertebral column, before the abdominal muscles have time to be on guard. In the first case this may be the explanation, but in the second the force seems to have been applied to the back from behind.

In view of the high mortality rate associated with cases of 12 hours' duration—stated to be as high as 70%—the child, who was not operated on until 24 hours afterwards, may be regarded as having made a fortunate recovery.

J. R. M. WHIGHAM, M.C., M.S., F.R.C.S.

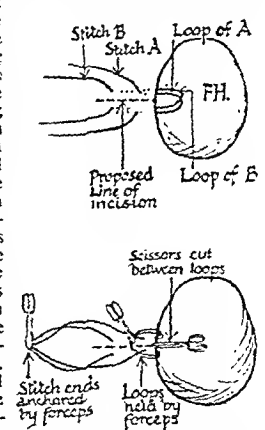
D. B. HANDELMAN, L.R.C.P., L.R.C.S., L.R.F.P.&S.

St Andrew's Hospital Bow

## A Technique for Episiotomy

In the comparatively rare instance in which this little operation is indicated the following method has been found useful: When the vulva is stretched by the presenting

part a director is passed to lift the rim slightly away from the advancing parts and stitches are then quickly passed, encircling the proposed line of incision (see diagram). Anchor the free ends lightly with artery forceps; draw the looped ends from under the edge of the vulva and anchor with a second pair of artery forceps. As the presenting part crowns (and a perineal tear is seen to be inevitable), draw the looped ends upwards, slightly retracting the edge of the vulva, and make a scissors cut between the loops (see diagram). After the birth and cleansing of the vulva, the wound edges are readily approximated by tying off the stitches. Further stitches can be inserted if necessary. This technique permits of an accurate approximation of the wound edges, and there is no need to give chloroform after the birth to relieve the pain of stitching up. For the sake of clarity the incision shown in the diagram



Borrowash, Derbyshire.

G. S. NEILSON Dow, M.B., Ch.B.

## Reviews

### THE ANTIGONADOTROPIC FACTOR

*The Antigonadotropic Factor, with Consideration of the Antihormone Problem.* By Bernhard Zondek and Felix Sulman, Hebrew University, Jerusalem. (Pp. 185. £53.00 or 16s. 6d.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1943.

This is a specialist monograph whose subject-matter involves both immunology and endocrinology. Many people are familiar with one of these subjects, but there can be few familiar enough with both to be able to read the book with ease. It is not confined to its title-subject, but reviews the literature on the other antihormones, and includes the first publication of a number of the authors' own experiments. The term "antihormone" is given inverted commas throughout because the authors conclude that such factors are not hormones but immune bodies.

When Collip first called attention to the formation of antihormones he suggested that they played a physiological part in the normal bodily economy, but in spite of a great deal of work carried out since that time the hypothesis has little evidence to support it. At present it is undoubtedly true that protein hormones, particularly those of the pituitary gland, when injected into man or animal provoke the production of antihormones which in time considerably diminish the response to successive injections. It is also true that almost all the experimental work has so far involved the use of impure extracts. To-day in America a number of the pituitary hormones have been prepared in crystalline, and presumably pure, form, and it will be interesting to see if these pure preparations also induce antihormone production. If they do, the theoretical interest of the subject will undoubtedly revive, but meanwhile the problem is a purely practical one. So long as clinicians are aware that antihormones are produced by the injection of the pituitary and gonadotropic preparations commercially available, there seems little point in their studying the problem any more closely.

The presentation is clear, though the style is poor. The text is, perhaps inevitably, interrupted by reference to long lists of names and dates; nor has Zondek kept in check his habit of coining terms—to refer to the ovary acted upon by chorionic gonadotropin as the "effector organ" is unnecessary and inaccurate; "gonadotropic-anti-units GAU" and "prolanti-units PAU" abound, and all are in rat units, although international units of chorionic and serum gonadotropins have been in existence now for five years. In spite of the wealth of references, the statement that "pregnant mares' blood gonadotropin . . . is also supposed to be of pituitary origin" is made without any reference, presumably because the majority of workers do not hold this view. Notwithstanding these blemishes the book will prove very useful as a work of reference.

### COMMON SKIN DISEASES

*Common Skin Diseases.* By A. C. Roxburgh, M.D., F.R.C.P. Seventh edition. General Practice Series. (Pp. 454; illustrated. 18s.) London: H. K. Lewis and Co. 1944.

There is no need to emphasize the excellence of a textbook which goes through seven editions in twelve years and has achieved two of those editions and three reprintings since the war began. Perhaps the chief differences between this and the last edition are to be found in the section dealing with industrial dermatitis, which has been expanded, and in the chapter on vitaminoses, which has been rewritten. A new disease seems now to have been added to dermatology, known as "immersion foot," which is a complaint brought on by immersion of the legs and feet for long periods in cold seawater in water-logged boats or rubber dinghies. This must be a very close relation of trench foot, with which medical officers were only too familiar during the last war, but the principle of the local treatment has now been radically changed. Formerly the extremities were kept warm, but it has now been found that very much better results are obtained if the feet are exposed to cool air while the rest of the body is kept warm and comfortable.

Dr. Roxburgh is one of those physicians who have been, fortunate enough, as readers of this *Journal* are well aware, to be entrusted with a supply of penicillin, and he has just had time to include in the present volume a short note on the results obtained from it in dermatology. He says that there is no doubt penicillin will prove a very valuable treatment for certain staphylococcal and streptococcal infections of the skin, and gives hope that syphilis, always considered one of the most refractory and chronic dermatoses, may be controlled by the new drug in a large proportion of cases.

The price of this edition has gone up 2s. to 18s., but one cannot say that this is in any way an excessive increment—in fact it is so small that one might almost think it is a "controlled" price.

### MEDICINE AND THE WAR

*Medicine and the War.* Edited by William H. Taliaferro. Charles R. Walgreen Foundation Lectures. (Pp. 193. 12s.) Chicago: University of Chicago Press; London: Cambridge University Press.

The University of Chicago Press has published a book of medical lectures on war topics given by distinguished workers in each field. The lectures include the subjects of food chemotherapy, malaria, spread of disease by aeroplane transport of insect vectors, shock and blood substitutes, aviation medicine, psychological effects of head injuries, psychiatry, and chemical warfare. Without disclosing secret information the lecturers give a useful account of the problems, well worth reading by medical men and others anxious to know what research is on foot during the war.

The editor of the book, Dr. W. H. Taliaferro, gives an account of malaria. He stresses the part played by immunity, which is often neglected in discussing this disease. The macrophages of the spleen, liver, and bone-marrow play a part in natural immunity; they digest large numbers of parasites, malarial pigment, and red cells containing parasites, removing as many as two-thirds of the parasite population. When acquired immunity is superimposed, the macrophages eat up many more parasites owing to the appearance in the blood of an opsonin, which makes the parasites more easily digested. Dr. C. G. Huff, the parasitologist, discusses the dangers of the spread of disease by aeroplane, and gives an account of the work of the Rockefeller Foundation in eradicating the *Anopheles gambiae* from Brazil, whither it probably came by plane from Africa. In 1938 about 60,000 people out of a population of 70,000 in the Jaguaribe river valley were attacked by malaria. Vigorous efforts in 1939 and 1940 resulted in complete control of this mosquito, and no larvae or adults have been found since September, 1940.

In the chapter on aviation medicine we are told of the physiological changes which occur in a pilot when he makes a sharp turn, as in pulling out of a dive; these include loss of vision and unconsciousness due to the centrifugal force acting on the blood in his head. In the chapter on head injuries there is an account of the effect on a patient whose frontal lobes were damaged as a result of the removal of a brain tumour. He gained a position as salesman for a small firm and was so successful in collecting orders that he was made vice-president of the company; so inspired was he by his success that he soon collected far more orders than could be executed. The firm, to avoid bankruptcy, dismissed him. He lacked the judgment to know when not to sell.

### Notes on Books

*Health Education on the Industrial Front* (Oxford University Press; 8s. 6d.) records the five lectures given at the 1942 Health Education Conference held under the auspices of the New York Academy of Medicine. In the lecture on "Food and Nutrition in the Home and in the Workplace" the data about workers' families are similar to those obtained in this country, and in addition it is stated that observations on clerical and laboratory workers in New York City showed a high incidence of nutritional inadequacy. From 25 to 50% of these persons showed mild but definite lesions characteristic of food deficiencies. A lecture on "Disease and Handicap Detection and Control in Industry" is followed by one on "Mental Problems and Morale in Industry," which gives instructive advice to the industrial physician for the maintenance of high industrial morale. The final lecture, on "Educational Methods and



Control of Accidents in Industry,<sup>1</sup> gives some figures of accident frequency which show that in America, after making due allowance for differences of population, the accident rate from motor traffic and from occupational causes is about twice as great as in this country.

*Atlas of Obstetric Technique* by Dr. PAUL TITUS, is a beautifully produced volume (Henry Kimpton; 36s.). It undertakes to present in pictorial form the subject of modern obstetric technique for both normal and abnormal cases. It also includes a section dealing with sterility. In its purpose it is the obstetrical complement to Bonney's *Operative Gynaecology*, but it compares favourably with this in the excellence of its individual drawings rather than in their selection or arrangement. For example, Section V, dealing with the most important subject of abortions, illustrates well the technique of evacuating a uterus, providing it is anteverted. The necessity for examining the pelvis carefully before operating is overlooked, and were this omission also made by the operator he would perforate the wall of many a retroverted uterus. There is one way to learn how to operate—the hard long road of the apprentice—but that road can be made easier and possibly shorter by an atlas such as this.

## Preparations and Appliances

### APPARATUS FOR INTESTINAL INTUBATION

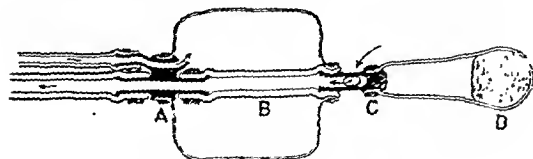
Dr. J. J. WILD writes from the Miller General Hospital, N.E. 10:

Owing to the unsatisfactory condition of the technique of intestinal intubation at the present time it was decided to try to improve the existing facilities. The apparatus described below has, up to now, given very satisfactory results in the few cases in which I have had the opportunity to use it.

The Miller-Abbott tubes at present manufactured in this country have, in my hands, proved most unsatisfactory. Even when first delivered many faults were found, such as leaks at the point of attachment of the inflation and aspiration nozzles and at the proximal point of attachment of the balloon. Also the bores of the tubes are constricted on occasion, the binding at the proximal point being applied too tightly. The quality of the rubber is too soft, so that the tube tends to collapse when reasonable suction is applied soon after the tube has come into use. I have not found this fault with the American-manufactured tubes, which are constructed of a harder, poorer quality rubber, presumably to avoid this trouble. Apart from these disadvantages I have, I think, overcome many of the inherent disadvantages of tubes used for intestinal intubation, so that the passage of tubes into the duodenum may be carried out with confidence of success whenever it is desired to do so.

#### Description of Apparatus

The apparatus in its present form was manufactured from hospital stock tubing and other sundries easily to hand, and has proved highly satisfactory. A constructional drawing is appended (approximately 2/3 scale) which shows the apparatus to consist of two separate tubes, one of adequate wall-strength to permit of effortless aspiration, the other, small-bored bicycle-valve-type tubing for inflation of the balloon. These are swallowed together and give little trouble so long as they are kept together at the time of passing. In the final development of the tube they will be vulcanized together.



At the point of attachment of the balloon a special easily constructed metal adaptor (A) is incorporated which does not affect the ease of swallowing; this provides attachment for the two tubes, for the proximal end of the balloon (an ordinary contraceptive condom), and for the continuation of the aspiration tube through the collar. Provision is made for a firm grip between metal and rubber, which is carefully bound on with strong thread. Exposed thread is treated with rubber solution to protect it from the contents of the gut.

On the end of the continuation piece of rubber (B) is attached a special metal connexion-piece (C) turned from steel to avoid amalgamation with the mercury. This provides attachment for the balloon proximally and for attachment of the gravity director head (D). This is the most important part of the apparatus and consists of a thin rubber bag taken from the ring or little finger of an old

surgical glove in good condition. This bag is filled with clean mercury expressed through cloth to a weight of 30 to 40 g., though less may be found satisfactory. There is a "dead" space above the mercury, and as little air as possible is permitted to remain when the bag is attached as before-mentioned. Such is the apparatus which I have used several times successfully, no failures having occurred so far.

Should the apparatus come into more general use, I have designed a tube to be made by the commercial manufacturers which will render the technique of intestinal intubation so simple that a highly skilled operator will not be necessary. The balloon will not have to be tied on when renewed but will be pushed on in a matter of seconds where this type of tube is to be used. Also, the metal parts used in my improvised apparatus will probably be eliminated.

The action of the gravity director head is as follows. The mercury acts as fluid ballast which will persistently seek the lowest point, and owing to the thinness of the rubber wall of the sack the mercury, on arriving at a depression such as a sphincter, will pass the end of the sack into the depression and by its weight tend to open the sphincter, allowing the end of the sack to pass together with a portion of mercury until all of the sack together with the mercury has passed the obstruction and pulled with it the remainder of the apparatus. Thus what was previously a problem of feeling a way in the dark has become a matter of merely giving the apparatus its head! Hence the term "gravity director head." This principle can, of course, be easily applied to duodenal intubation for collecting specimens of bile, and as soon as opportunity permits I intend to carry out full clinical trials and publish the results.

#### Technique of Passing the Tube

The patient is told to open his mouth and put out his tongue, which is depressed with a spatula. The tube, dipped in water or lubricated with a non-oily lubricant, is thrown so that the gravity director head falls to the back of the mouth and slides down the pharynx. The patient is instructed to swallow twice and breathe hard. Vomiting may occur but this will not dislodge the tube owing to the weight of the mercury. When the patient has regained control, he is given sips of water and the tube passed down into the stomach. Aspiration is started at this point with about 150 c.cm. metal syringe. Sufficient tube is then swallowed (about 30 inches), if possible with the patient on his right side and with the foot of the bed blocked up as high as possible. If desired the patient may be carried on his right side to the theatre, and the journey will probably facilitate the passage of the director head into the duodenum. If facilities are available the patient is radiographed in this position in bed, and if the tube is found not to be in the duodenum he is lifted high by his buttocks on his right side and rotated and shaken to facilitate the passage of the tube under the action of gravity. This manipulation is only necessary when the tube will not pass easily. If difficulty is experienced, a little watery barium sulphate may be put into the stomach in order to see the position of the outlet of the stomach as compared with the director head.

As a rule, I think the tube will pass easily provided enough is swallowed. Often, if an immediate success is not obtained, repeated aspiration of the stomach will restore its tone and the tube will be found in the duodenum later if the patient is kept on his right side. Manipulation and x-ray control need only be used when it is urgently required to pass the tube.

So far I have had difficulty with one case only (paralytic ileus following gastro-enteritis) and have had to resort to manipulation and x-ray control. No failures have occurred so far (six cases). With experience I hope to evolve a technique which will give very few, if any, failures.

I have taken out provisional protection of the gravity director head with a view to preventing anyone restricting the use of the apparatus by patenting it. It may be possible to get the two metal connexions made as in the improvised tube described, should the demand be great enough, so that anyone interested could try the tube out.

I am indebted to my colleagues at the Miller General Hospital for their kind help in many ways.

### NEW CHOLECYSTOGRAPHIC AGENT

Burroughs Wellcome and Co. announce the issue of preparations of "pheniodol," a new cholecystographic contrast medium for oral administration. Recent clinical trials (*British Medical Journal*, 1943, 2, 674; *Brit. J. Radiol.*, 1944, 17, 60) have shown this substance to possess important advantages as regards effectiveness and tolerance. "Wellcome" brand pheniodol, the pure compound, is available in bottles of 25 g. "Wellcome" brand pheniodol meal presents the substance combined with wetting and flavouring agents which enable an easily taken and palatable suspension to be conveniently prepared: it is issued in tubes containing 4.5 g., equivalent to 3 g. (the normal adult dose) of pheniodol available singly and in cartons of 6 tubes.

## BRITISH MEDICAL JOURNAL

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## MEDICAL SERVICES FOR THE WESTERN FRONT

The attack on Western Europe has opened, and the share of the medical profession in this has been graphically illustrated in the daily press. Wherever the fighting man goes the doctor goes with him, and shares many of his risks so that he can offer him the indispensable first aid and what is termed "life-and-limb surgery." The nature of his medical training and the free circumstances of the peacetime practice of his profession develop a sense of responsibility and adaptability that serves the British doctor well in war, whether he falls through the air with the paratroops or crouches beside the wounded soldier on the sand of the desert or of the Normandy beaches. So that the wounded and disabled may receive complete medical and surgical aid at the shortest time after injury a vast organization is necessary, and this is a fitting moment to give some account of the medical organization that has evolved out of more than two years' planning for D Day.

There are now over twenty varieties of medical units accompanying the Forces. Many of these varieties are subdivisible into types: for example, there are various types of field ambulances, such as light field ambulances, parachute field ambulances, and air-landing field ambulances. There are various types of field surgical units, from special teams for neurosurgery, maxillo-facial surgery, and chest surgery, to the standard field general surgical unit for reinforcing casualty clearing stations, and, in conjunction with field dressing stations and field transfusion units, for forming advanced surgical centres. There are a large number of field dressing stations, field transfusion units, casualty clearing stations, general hospitals, hospital ships, hospital carriers, and specially equipped L.S.T.s (Landing Ships, Tanks). These are only some of the types. In all there are more than 400 medical and dental units, including a special unit provided by the British Red Cross Society and Order of St. John of Jerusalem. These units have establishments providing specialists as required in every branch of medicine and surgery, nursing orderlies, dispensers, cooks, drivers, etc. The vast majority are mobile, and all have been thoroughly trained; some have wide experience of active operations. These units are allotted to formations according to their needs. Divisions are accompanied by field ambulances, field dressing stations, and field hygiene sections; corps by field dressing stations, casualty clearing stations, general hospitals, and advanced depots of medical stores. G.H.Q. has at its disposal an imposing array of all types, including general hospitals of 600 and 1,200 beds whose staffs include specialists in every branch of medicine and surgery, including dentistry. Finally, divisions, corps, and armies have their own medical staff officers, supervised and controlled by the Director of Medical Services of the force, assisted

by the strongest possible teams of experienced consultants, advisers, and administrative officers.

In the United Kingdom the Ministry of Health, through the Director-General of Emergency Medical Services, has provided tens of thousands of beds staffed and equipped to deal with all types of casualties. Special hospitals have been set apart as casualty clearing stations, others as base hospitals. Military and civil ambulance trains and fleets of ambulance cars, including cars of the British Red Cross Society, convey casualties from ports and airfields to the casualty clearing hospitals (transit and port hospitals). Naval, Army, and civilian staffs man the ports to unload patients from L.S.T.s, hospital ships, and hospital carriers to ambulance trains and ambulance cars. These ambulance trains carry drugs (including penicillin), dressings, food, and other comforts. Special arrangements have been made for notifying next-of-kin: as soon as the patient is admitted to a base hospital a card giving all details is dispatched.

A heavy load rests on those responsible for such an intricate system of essential services. We may recall that the German Army was brought almost to the point of capitulation on the Russian front owing to a breakdown of the medical organization under winter conditions. In the framework provided by organization the individual doctor, and teams of doctors and surgeons, bring their technical skill to the aid of the individual sailor, soldier, and airman. No matter what the type of military operation or the conditions under which it takes place, the principle controlling the handling of sick and seriously wounded in the forward zone is rapid collection and evacuation to an appropriate surgical centre. The main links in the channel of evacuation are regimental aid post, advanced dressing station, field dressing station, casualty clearing station, and general hospital at the base. At the regimental aid post adequate first aid, including the administration of morphine and sulphonamide, and measures for the treatment and prevention of shock, is carried out. At the advanced dressing station patients are divided into three groups: (1) those in need of urgent resuscitation before they can be evacuated to the surgical centre; (2) those suffering from severe wounds that require urgent surgery; and (3) all other patients. Group 1 patients are evacuated to the divisional field dressing station, which is never more than a short distance away and has all the equipment for resuscitation. After resuscitation these patients are sent to an advanced surgical centre if they need urgent surgery, or, if they are fit for evacuation, to a casualty clearing station. Group 2 patients are sent direct to the advanced surgical centre from the field dressing station. The advanced surgical centre may be at the casualty clearing station. But if the distance between field dressing station and casualty clearing station is great an advanced surgical centre is formed nearer the forward troops by the attachment of one or more field surgical units and field transfusion units to a field dressing station. From the advanced surgical centre, if a separate centre has been formed, patients are evacuated to the casualty clearing station. Group 3 patients are evacuated direct from field dressing station to casualty clearing station. In effect this system of evacuation, though it sounds compli-

cated, means that all casualties are sent back to a casualty clearing station, but that facilities are available for preliminary urgent treatment and life- or limb-saving surgery further forward on the line of evacuation. Routine surgery is not carried out in the foremost medical units because they are not normally in a position to provide adequate post-operative care and nursing. A balance has to be struck between the sometimes conflicting claims of early surgery and evacuation. From the casualty clearing station patients are transferred to general hospitals, either the smaller hospitals with the field force or the larger units at the base.

Evacuation by sea must have special consideration. In the absence of suitable ports, specially equipped L.S.T.s with a staff of doctors and nursing orderlies on board, hospital carriers reinforced by surgical teams, and, later, hospital ships, will be used. After receiving adequate first aid and life-saving surgery casualties will be embarked on these craft by water ambulances, D.U.K.W.s, and other small craft. Plans have also been made for large numbers to be evacuated by air when suitable facilities are available on the Continent. The R.A.F. are providing a ground organization at aerodromes, both in the theatre of operations and at home, for the care and accommodation of patients from the time they are handed over to them by the Army in the theatre of operations until they are taken over from them in the United Kingdom.

That, briefly, is the normal procedure. But under the conditions which obtain during an assault from the sea on a strongly defended coast this procedure has to be modified. In the early stages treatment of the wounded consists of adequate first aid similar to that already described. Further treatment will consist of "life-and-limb" surgery and measures to combat shock and sepsis. The organization on or near beaches consists of beach dressing stations, advanced dressing stations, and advanced surgical centres. These units follow close behind the assaulting troops and establish their special centres in a few hours. Supplies of blood products for transfusion are maintained by a special organization based initially on the Army Blood Supply Depot in England. In the early stages all patients are evacuated to the United Kingdom as quickly as possible. All that can safely be done on the spot is done. But definitive surgery must await suitable conditions, such as adequate facilities for operating at a reasonable distance from the noise of battle, and arrangements for adequate post-operative treatment, which includes rest and good nursing. Casualties fit for evacuation are transferred from shore to ship by D.U.K.W.s, which can proceed from the dressing station across sands and sea to the L.S.T.s waiting off-shore. These D.U.K.W.s can be driven straight into the L.S.T.s. The interval between "life-and-limb" surgery and "definitive" surgery is one in which gas gangrene and sepsis have to be prevented or controlled. One step that has been taken is to provide supplies of penicillin on the beaches, on L.S.T.s, on hospital carriers, and on ambulance trains; detailed instructions have been issued regarding dosage and records to be kept. Suitable cases will be given 100,000 units of penicillin intramuscularly before leaving the advanced surgical centre or casualty clearing station. Maintenance doses of 50,000 units at intervals of about five hours will be given until the patient

reaches the surgeon in the transit or port hospitals. In addition to penicillin, whole blood is available on L.S.T.s and hospital carriers. On arrival at United Kingdom ports patients are rapidly sorted by experienced surgeons into two categories. Those requiring immediate treatment will be sent to near-by hospitals already set apart and ready; the remainder will be dispatched by civil or military ambulance train (staffed by doctors, nurses, and orderlies) to E.M.S. transit hospitals located within a couple of hours' train journey. At these transit hospitals civilian surgical teams, reinforced where necessary by Army surgical teams, carry out all urgent surgical measures. From these hospitals patients, when fit to move, will be dispatched to base hospitals (E.M.S.) all over the United Kingdom, and in due course will be sent to military convalescent depots for rehabilitation and hardening to fit them once more for active service.

At this turning-point in our history the men of the United Nations are grappling at close quarters with the enemy, and it is natural that our attention should be focused on measures for treating the wounded. Of no less importance—indeed of greater importance—are all those measures comprehended under the term "preventive medicine." Many a general has been defeated by bad sanitation and by ignorance of the cause of disease. The fortunes of war turn ever more closely on the good hunting of the scientist in the laboratory—and, from the medical standpoint, especially the laboratory of the bacteriologist.

### THE ENGLISH DISEASE

At the beginning of the seventeenth century doctors took note of a new disease, common in the South-West and popularly known as the rickets. Milk was at this time, according to Drummond,<sup>1</sup> giving place to bread in the national diet. Whether because of the frequency of rickets in England or because the earlier descriptions by Whistler, Boott, and Glisson were of English cases, Europe called it the English disease. In 1650 Glisson and his colleagues of the College of Physicians reported on the clinical aspects of the disease in a historic treatise.<sup>2</sup> The latest addition to the long enlightening literature takes the form of a report on the incidence of rickets in wartime, presented by the British Paediatric Association at the invitation and with the co-operation of the Ministry of Health.<sup>3</sup> The lack of uniformity in age studied and in selection of cases in the pre-war surveys in London, Manchester, Newcastle-upon-Tyne, and Glasgow, summarized in this report, makes comparison difficult, but the question how far war conditions may have checked the recognized decline of rickets in pre-war years receives a negative answer. It may be pertinent to note that for "wartime" could be written (though a neat portmanteau phrase for it is lacking) the time when once again milk is taking its place in the diet, particularly of pregnant women.

The report reads like an epitaph on clinical rickets, at least in Southern England. Rickets is defined not as a clinical syndrome but as a metabolic or nutritional dis-

<sup>1</sup> Drummond, J. C., and Wilbraham, A., 1939, *The Englishman's Food*.

<sup>2</sup> Glisson, F., 1650, *De Rachitide*.

<sup>3</sup> Ministry of Health Reports on Public Health and Medical Subjects No. 92. H.M. Stationery Office, (9d.)

order "characterized by imperfect calcification of growing bone." The criterion for diagnosis was detection of this imperfectly calcified bone in an x-ray picture of the left wrist. Of the 5,283 children investigated in the early months of 1943 in twenty-two centres in the British Isles and one in Dublin, 106 showed signs of rickets in the opinion of two out of the three examining radiologists. In Great Britain, of 3,328 children aged 3 to 12 months 17 showed active and 56 healed or healing rickets, and out of 1,490 aged 12 to 18 months there were 3 active and 7 healed, rates of  $2\frac{1}{2}\%$  before 6 months and 4% during the first year. In Newcastle-upon-Tyne, Manchester, Leeds, and Sheffield the rate among 504 examined before 1 year old was 10 to 12%. Clinical evidence of active rickets was present in 604 out of 4,818 children in Great Britain at ages 3 to 18 months, the proportions varying from none at St. Albans and Watford to 61% in Sheffield. The most important clinical sign was taken to be craniotables at 3 to 4 months, enlargement of costo-chondral junctions at 6 months, and of the epiphysis at the wrist at the end of the first year. Unfortunately for the value of these signs only 32 of the 604 so diagnosed showed radiological signs, while of the 4,214 clinically normal, 48 showed radiological signs. Correlation between clinical and radiological cases was poor. Biochemical tests, performed at some centres, are not recorded, and it would be interesting to know how far babies with a raised blood phosphatase would form another group and how far clinical, radiological, and biochemical rickets occurs in the same case.

Owing to the small number of cases of rickets diagnosed, information about the type of feeding and the amounts and kinds of vitamin D additions to the diet proved too much even for the virtuosity of Dr. Percy Stocks, so ably displayed in the general analysis of the collected observations. Nevertheless the report concludes that rickets, while more common in the artificially fed, may be expected also in the breast-fed baby, and that there is scope for better prophylactic measures and more extensive use of the Government's cod-liver oil. The British Paediatric Association and those who helped in this careful survey deserve congratulation. The report has drawn attention to the difficulties in the diagnosis of rickets when cases of florid type are scarce, and it will provide a good basis for comparison with any future surveys.

Two lines of thought are started by the reading of this report. First, what is the precise importance to the health of the community of "imperfect calcification of growing bone"? A recent paper<sup>4</sup> from Prof. Park's Clinic at the Harriet Lane Home gives the results of histological study of the middle ribs in 230 consecutive necropsies in children between the ages of 2 and 14 years dying from all causes. Of these 23% showed slight, 18.7% moderate, and 4.8% advanced, rickets—a total of 46.5%. The percentage was greater among those dying of illness lasting less than 14 days. In 5 cases at most were changes noted in a radiograph. The authors doubt if slight degrees of (histological) rickets interfere with health or development. Accepting the definition of rickets as a disease characterized by imperfect calcification of growing bone, it seems certain

that rickets was present in many more cases in the British Paediatric Association's survey than were apparent in x-ray pictures of the left wrist. How far does histological or radiological rickets matter? Here is a problem to stretch the pia mater of an apostle of positive health. The second thought is of thanksgiving for the good fortune of the British Isles, where the importance of clinical, radiological, and histological rickets can form the subject of argument at a time when so large an area of the populated world is faced with the reality of gross and unmistakable nutritional disease. The English disease bids fair to end as the European disease.

### RESPONSIBILITY FOR CLEAN MILK PRODUCTION

When the Minister of Agriculture, with the acquiescence of the Minister of Health, seeks the transfer to himself of statutory powers relating to the prevention of disease of milk-borne origin it is well to bear in mind the functions and fundamental purposes of the respective Ministries. In all matters affecting the public health, and for all measures in State medicine authoritatively taken for the prevention of disease among human beings, the Minister of Health has been and must remain responsible. Where primarily the administration of an Act is placed upon local authorities the Minister concerned must see that they exercise their powers and duties or, in their default, that they are superseded by a major local authority, or, in the last issue, by the central authority ultimately responsible. Failure is an affair not merely of local but of central government also. The Minister of Agriculture recognizes this, but his answer in the debate on the second reading of the Milk and Dairies Bill on May 19 was a *non-sequitur*. He said that the whole problem had radically changed since 1926, when these powers were originally entrusted to the local authorities. The intention stated by Mr. Hudson that he and the Minister of Health will be jointly responsible for making regulations for the control of milk supplies does not necessarily imply a joint responsibility for enforcing them.

The battle for clean and safe milk—in which the Board of Agriculture was not conspicuous for its zeal—began and bore fruit long before 1926. It is true that progressive dairymen, led by the Institute of Research in Dairying, Reading, and by local agricultural committees, have done much to rationalize and simplify methods and requirements since that time. The problem has changed, but has changed largely because of the comparative success which has attended the efforts of the most zealous local authorities and their officers. Not so long ago (but long before the date given by Mr. Hudson), when the infant death rate was three and four times what it is to-day, medical practitioners and medical officers of health were agreed that for a large part of this mortality infected milk was to blame. In the industry with which the Minister of Agriculture is identified, and to which public attention was then directed, investigation showed intolerable conditions in respect of premises and practice. To a considerable degree, due largely to the activities of local authorities whom it is now sought to supersede, these evils have been mitigated. Milk, it was

<sup>4</sup> Follis, R. H., Jackson, D., Eliot, M. M., and Park, E. A., *Amer. J. Dis. Child.*, 1943, 66, 1.

found, was grossly fouled on the farm, from uncleanly cows, in insanitary cow-sheds, in unsuitable and ill-equipped dairies, by the ignorant practices of cowmen and dairy hands, in transport to the wholesaler, from him to the retailer, and again by the retailer and in the home of the consumer. Sanitary inspectors and health visitors were trained to deal with these evils and to instruct in the hygienic handling of milk whether at the farm or during transit, and the local authorities were armed with statutory powers to enforce compliance. The veterinary inspection service, of which Mr. Hudson is so rightly proud, had its local origin in these efforts, and initially was brought into being by the major health authorities at the suggestion of medical officers of health. The reduction of infection of infants by cows' milk was partly responsible for the decline in infant mortality which, during the last half-century, rewarded the efforts of local authorities and their officers. Tuberculosis, typhoid fever, scarlet fever, diphtheria, and other diseases, in addition to the diarrhoea of infants, may in a variety of ways be milk-borne, and have each called for preventive measures and been dealt with under statutory powers for inspection of the milk supply which have served their purpose but are now to be split and redistributed. The health officers, to whom they owe their origin, are to be deprived of these slowly evolved powers over milk production, which, it appears, are to pass into the hands of veterinary officers, who are not primarily concerned with human diseases or with the preventive steps appropriate for the control of most of them. The M.O.H. will still be responsible in theory for the prevention of these diseases, but in practice he will enter the field only after the damage has been done. This disjunction of responsibility is comparable to the larger disorganization which the proposals for a comprehensive medical service will involve in other spheres of medicine and public health.

Under an illusion that the Ministry of Agriculture is equipped with the means and the staff for doing what some local authorities, for reasons well understood, have failed to do, most of the M.P.s who spoke in the debate seemed to be willing to hand over to that Ministry responsibilities which it cannot discharge. It is no reflection upon the veterinary inspectorate of the Ministry of Agriculture to say that neither by their numbers nor by their training can they replace in this field of preventive medicine the M.O.H. and his staff, trained in the technicalities for control of disease in man and constantly present in the localities where the dairy farms are situated. No one more than the Public Health Service can welcome the veterinary inspector's efforts to improve, both in health and in quality, the "stock" which are his care, but there is confusion of thought in the failure to distinguish this province of veterinary medicine from that of preventive medicine concerned to control the conditions, at the source as well as at the periphery, under which milk becomes a dangerous vector of disease to human beings.

The main reason given for the transfer of the responsibility for inspecting premises, equipment, and methods of milk production is the neglect or incompetence of defaulting authorities and their officers. Because of the failure of some authorities and of local benches of magistrates to do their duty all the machinery of supervision by

the greater number of local sanitary authorities is to be scrapped, ostensibly to place it in more efficient hands. The weakness of this argument becomes plain when the inadequacy of the staff possessed by the Ministry of Agriculture to deal with the vast volume of work hitherto performed by local authorities is considered. How do the numbers of veterinary officers at the Ministry compare with the army of sanitary officers throughout the country engaged in an endeavour to secure proper conditions in the production as well as the distribution of clean, wholesome, and safe milk? Are trained veterinary practitioners, diluted by a lay inspectorate, to be engaged in sufficient numbers to replace the sanitary inspectors whom it is proposed to withdraw from this work but who cannot be cut down in numbers because of their other local duties? The Ministry of Agriculture should concentrate on the improvement of stock, the raising of healthy cattle, and the care for dairy produce and milk marketing: the Minister of Health should continue to see to it that whoever undertake inspection they shall conform to his requirements for the protection of the public health. The powers hitherto vested in local health authorities are a legacy from generations of experienced hygienists. If it is established that smaller sanitary authorities are hindered in their work by local influences, the remedy is to enlarge the administrative area for this and other functions of local government.

### THE MINISTER REPLIES

The news that the Annual Representative Meeting to be held in July has been postponed at the request of the Government was received by most doctors with mixed feelings. But we rested securely on the understanding with the Ministry of Health that a Bill would not be brought before the House of Commons until full opportunity had been given to the profession to formulate its policy, and to make representations on a proposed legislation. The Minister of Health, however, gave replies to questions in Parliament last week which suggest that this understanding is not bilateral. When on June 8 Dr. Howitt reiterated a question put two days before by Sir Ernest Graham-Little in the following words:

"In view of the postponement of the Annual Representative Meeting of the British Medical Association at the request of the Government, will he give an assurance that legislation on a National Health Service will not be introduced by him until after negotiations have taken place between him and the medical profession, bearing in mind that under its constitution only the Representative Body of the Association can determine the policy of the B.M.A.?"—

Mr. Willink's reply was as follows:

"My hon. friend will appreciate that I cannot give an assurance quite so absolute as he suggests. It is still my wish to have full discussions with the profession before introducing legislation, and I see no reason why I should be prevented from doing so by the delay which will be caused by the profession's inevitable postponement of its conference."

The last fifteen words of the Minister's reply convey an impression which, in the interests of accuracy, it is desirable to correct. The B.M.A. was requested by the Minister of Health to postpone the meeting of the A.R.M.<sup>1</sup> So let it be clear that in this case the profession has had to act on Government instructions. The B.M.A. is compelled by circumstances to postpone its deliberations and for the

<sup>1</sup> See letter from Ministry of Health, *British Medical Journal*, May 27, 1944, p. 727.



time being to remain in ignorance of what the policy of its members in relation to the White Paper proposals is, or, as the Minister well understands, the Representative body alone has the power to make policy. As the Minister of Health has been forced to impose this delay upon us it was taken for granted that he would impose a delay upon himself and his Department in accordance with the understanding that has prevailed between the Ministry and the Association in this matter. But his answers in Parliament last week raise a doubt whether this understanding still exists.

### SPANISH MEDICINE

The Prime Minister's recent references to Spain provide an occasion for reflection on the history and present condition of medicine in that country. Almost exactly 100 years ago an English traveller of exceptional discernment described<sup>1</sup> among other characteristics of the contemporary Spanish scene the low standard of medical education and practice, the menial position of the medical profession, and the hostility of Church and aristocracy to progress. He asked: "Can it still be wondered . . . that their textbooks and authorities should too often be still Galen, Celsus, Hippocrates, and Boerhaave?" adding that "the names of Hunter, Harvey, and Astley Cooper are scarcely more known among their M.D.s than the last discoveries of Herschel." That Spanish medicine should have lagged so far behind is remarkable when one considers the important part played until the thirteenth century by Spain, and especially by the School of Translation at Toledo, in the rediscovery of Graeco-Roman and the transmission of Arabic medicine. In succeeding centuries the darkness is hardly relieved except by Miguel Servet (Servetus), who, bold enough to question Galen but not bold enough to face the ecclesiastical music, fled from Catholic Spain to Calvinistic Geneva, only to perish a victim of fanaticism equally ruthless in its opposition to truth and light.

There are evidently some in Spain who feel that their country does not receive a just recognition in foreign medical histories. Thus, the translator of the Spanish edition<sup>2</sup> of the standard English-language work found it necessary to add a 103-page appendix on the history of Spanish medicine. Similarly, a Spanish edition<sup>3</sup> of a popular English history of surgery is amplified by a 54-page appendix on "Surgery in Spain." It must be confessed that a reading of these appendices does little to encourage the view that important Spanish contributions have been overlooked. Yet in the Arts and those other fields of human endeavour by which a nation's progress is measured Spain occupies a sure and important place, and those Spanish medical men who have in recent years found the opportunity to work in clinics and laboratories in Britain and the Americas have shown no lack of scientific talent and aptitude. The reason for this poverty of medical science in a nation whose natural genius cannot be doubted must surely be sought in the anachronistic survival of that spirit of authoritarianism which is the mortal enemy of experiment and discovery.

In a search for significant Spanish contributions to the body of medical science it is necessary to turn to one who died only ten years ago in Madrid—Santiago Ramón y Cajal. Even Cajal<sup>4</sup> lamented that Spain owed almost all

it had of science and technology to other countries. In a paper<sup>5</sup> read recently in Spanish at the newly founded Instituto Español in London convincing reasons were given for regarding Cajal as the most illustrious Spaniard of the last century. Without belittling the importance of the arts, of philosophy, and of religion, it is not by these paths, but through science that Spain must find her salvation in the twentieth century. The layman may find it difficult to appreciate the greatness of Cajal's work, which was in the domain of fundamental biological science and did not result in those practical applications which attract popular interest and acclaim, but apart from the direct value of his work, it would be difficult to overestimate the indirect influence of Cajal on Spanish thought. He opened the eyes of many Spaniards, who, then and since, first saw beyond authoritarian barriers the more spacious world of scientific inquiry, criticism, and objectivity, and to them his memory remains an inspiration which forms a link between those in exile and those at home. For the first time medical scientists of other countries found it necessary to learn Spanish in order to follow new discoveries in the original. The many honours which were showered upon Cajal from abroad at a time when the national prestige of Spain was at its lowest ebb had an important effect on the public and official attitude to science. It is interesting to speculate upon what would have been Cajal's view of the position of Spain in the present world-wide conflict. Perhaps the answer may be found in his own words<sup>4</sup>: "In the democratic State all liberties are sacred except one—the negation of liberty. And all rights are legitimate except this—the mental deformation of future citizens. We respect as sacrosanct the precious germs of reason, for they belong not to us but to God."

There is evidence that the values for which Cajal stood have not been entirely extinguished in the Spain of to-day, and recent British visitors have spoken with particular enthusiasm of the research<sup>6</sup> on nutritional deficiencies which is being undertaken in the institute at Madrid directed by Prof. C. Jiménez Díaz. Spanish has not hitherto been regarded as a medically or scientifically important language, but in Argentina, Mexico, Chile, and elsewhere in the Spanish-speaking world active centres of medical investigation exist or are developing, and it seems not unreasonable to suppose that Spanish will in the future achieve an important position not only as the language of saints and soldiers, of poets and philosophers, but also as a medium for the communication of discoveries in medicine and other scientific fields.

### THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* have been printed. They will, however, not be issued with all copies of the *Journal*, but only to those readers who ask for them. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Accountant, B.M.A. House, Tavistock Square, London, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

Mr. Desmond MacCarthy, LL.D., will deliver the Lloyd-Roberts Lecture at the Royal College of Physicians of London, Pall Mall East, on Tuesday, July 11, at 4.30 p.m. Subject: "Psychology in Literature."

<sup>1</sup> Ford, R., 1846, *Gatherings from Spain*. (Reprinted in Everyman's Library, 1927, Dent, London.)

<sup>2</sup> Garrison, F. H., 1922, *Historia de la Medicina*, Calpe, Madrid.

<sup>3</sup> Graham, H., 1942, *Historia de la Cirugía*. Iberia-Joaquín Gil, Barcelona.

<sup>4</sup> Ramón y Cajal, S., 1932, *Charlas de Café*, 4th edition. [Reprinted in Colección Austral, 1941, Ercas-Calpe Argentina, Buenos Aires.]

<sup>5</sup> Vázquez-López, D. E., 1944, *Cajal y la ciencia Española*. [Paper read at the Instituto Español, 58, Prince's Gate, London, S.W.7, but not published.]

<sup>6</sup> Most of this work has been published in *Revista Clínica Española*.

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*Among 1,530 primigravidae the toxæmia rate was 27.1 per cent. as compared with the rate of 31.7 per cent. in a control group of 1,512 primigravidae not receiving*

*the supplement. Based on an annual birthrate of 600,000, this represents a possible reduction of 10,000 cases of toxæmia per annum by the use of a pre-natal diet adequate in vitamins and mineral elements. Noteworthy, too, was the effect on the new-born infant as shown by a definite reduction in the number of premature births.*

Similar results obtained by investigations at the Toronto General Hospital<sup>2</sup> showed that a good, or supplemented, pre-natal diet resulted in better health for the mother, a lower incidence of toxæmias, miscarriages, premature births, or still births, with a decrease in the morbidity and mortality of the infant during the early months of life.

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<sup>1</sup> *Brit. Med. J.*, 1942, 2: 77.

Pregnavite in recommended doses supplies, at time of manufacture, approximately:—

Vitamin A	4,000 i.u.	Calcium	350 mg.
Vitamin B <sub>1</sub>	200 i.u.	Phosphorus	550 mg.
Vitamin C	400 i.u.		
Vitamin D	300 i.u.	Available Iron	12 mg.

<sup>2</sup> *J. Nutrit.*, 1941, 22: 515. *Canad. Med. Ass. J.*, 1943, 48: 1507 & 1508.

Further particulars of Pregnavite Tablets gladly sent on request. Vitamins Ltd. (Dept. B.P.N.1), 23, Upper Mall, W.6.

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## MEDICINE IN FREE CHINA

BY

WILDER PENFIELD, C.M.G., F.R.S., Hon.F.R.C.S.

*Professor of Neurology and Neurosurgery, McGill University,  
Montreal*

The people of China were turning away from their own ancient forms of medical practice at about the time this war broke out, and the Chinese Government had embarked upon a policy of rapid increase in the number of university medical schools. Instead of expansion, however, the loss of the seaboard cities to Japan has resulted in closure of 28 out of China's 29 medical schools. Simultaneously, the blockade shut off from that country the supplies of drugs, equipment, and medical literature upon which their physicians had previously depended. At such a time as that it became necessary to create in China a medical service for a large army.

This dilemma has been faced by the Chinese undaunted and with characteristic resource. The following notes on medical education, the Army Medical Service, and medical problems of wartime China were made during an all too brief journey into that country during the summer of 1943.

### Medical Education

Situated in the rice fields near a village outside Chungking is a cluster of temporary buildings, surfaced with mud and painted black. This is the Central Hospital of Nanking and the Shanghai Medical School. Set out in the place of honour between hospital and medical school is the library and reading-room, in which is housed a precious hoard of books and out-dated medical journals that was transported somehow across the whole of China. In the medical school there are 250 students. They live in rooms which accommodate six to eight, furnished with "double-decked" beds, a narrow table, and a single candle for light.

On entering one of the hospital wards I saw on the dirt floor a brazier of burning coals, and on it, boiling in a metal dish, familiar-looking surgical instruments—sterilization which was efficient if unorthodox. This was the obstetrical service of Prof. Gordon King (himself a refugee from Hong Kong).

The patients lay quietly, their beds crowded in neat rows. A young Chinese woman, graduate of Johns Hopkins, was speaking in a low voice, and around her clustered a dozen students. I picked up a case history. It was written in English on flimsy brown paper, detailed, and well organized; temperature chart, progress notes, nurses' notes, all as they should be. Within the ward was the quiet bedside discussion, the atmosphere which should be found in a good teaching hospital anywhere—Baltimore, London, Moscow.

Outside, ducks were quacking and splashing in the rice fields, and along the raised path two coolies approached at a trot, carrying between them a patient in a chair. Along the dirt highroad beyond came the Chungking bus, and, as it stopped, the billowing black smoke of its exhaust betrayed the fact that it burned alcohol—a fuel easily produced in this country of farmers. Passengers alighted and streamed along the path to the hospital.

There are other universities and medical schools that have re-established themselves with similar equanimity, with the same air of undisturbed scholarship in the face of the greatest hardships and personal privations. Many of the schools have, of course, disappeared. Only one in the whole of China continues in its own buildings—the West China Union University Medical School in Chengtu.

Chengtu, in the heart of the Szechwan province, which was formerly the most inaccessible region of China, has become the principal haven of university refuge. Here West China Union University has welcomed on its capacious "campus" National Central (Nanking), Cheeloo (Tsinan), and Peking Union Medical Schools. (After four years the medical school at Nanking moved into separate buildings in Chengtu.) Laboratories, libraries, and class-rooms are shared, teaching and research are carried on, and degrees are granted by each institution separately.

The standard of these medical schools is high. The course in medicine at West China and at Cheeloo is seven years (Peking Union, eight years). The course is divided into two years of premedical work, four of medicine, and one spent

in a rotating internship with field work in public health, followed by preparation of a thesis. Before entering the above medical courses students must have spent six years in primary school and six years in secondary or middle school.

The school of dentistry at West China Union is partly amalgamated with medicine, and the courses are identical in the first four years. The dental course there is also of seven years' duration. They graduate only about 12 men annually, and this was the sole dental school in China until the Nanking National Central University began theirs recently.

It would be impossible for me to follow the fate of all of China's 29 medical schools. There are two refugee institutions in Chungking, working under indifferent circumstances. One of them, Kingsu, is a German-speaking school. North-Western is at Hangchow, in Shensi province, and Hsiangya (Yale in China) is at Kweiwang. There are two medical school "war babies" which have been formed in war years—one at Kweilin and the other at Kweiwang. (For much of this information I must thank Dr. Leslie Kilborn, formerly of Toronto, Dean of Medicine in West China Union University.)

In order to make up for the shortage of medical men to some extent the Ministry of War has created Army Medical Colleges. The largest of these, now at Anshun, was founded 40 years ago. The course lasts only four years instead of the six or seven demanded by civilian Chinese medical schools. About 1,000 surgeons and 400 pharmacists have been graduated in these military colleges.

The effort to keep alight the flame of medical education is gallant enough, but at the present time even Chengtu, with its three medical schools, is qualifying only 50 to 60 graduates yearly. In the whole of Free China Dr. Kilborn estimated that, exclusive of the military colleges, not more than 100 to 150 doctors can be qualified by the universities each year at the present rate. The population of China is said to be between 450 and 600 millions, and the Chinese Government has estimated that the country needs at least 225,000 physicians.

The English-speaking missionary has done splendid work, and is still doing what he can with worn-out instruments and failing drugs. Without considering religion in these pages, his major contribution has been to teach some of the future teachers of Chinese medicine. He has, of course, also introduced the English language, and has presented Western culture in a favourable light, perhaps considerably more favourable than it deserves.

In Chengtu and Chungking the teaching by medical missionaries is on a high academic level. The sabbatical system of returning each to his own country every seven years has given opportunity for postgraduate training, and this, together with the stimulating effect of the obvious need, has made excellent teachers of men who may not have been chosen primarily on the basis of academic distinction.

### The Chinese Army Medical Corps

The number of doctors required, according to Western standards, for the Medical Corps of the Chinese Army would be double the total number of medical men that have been trained so far in that country during its entire history. It is obviously impossible, therefore, to provide an Army, estimated at nine million men, with a medical service that is entirely satisfactory; just as impossible as it is to provide at this time the hundreds of millions of Chinese civilians with adequate medical care.

Nevertheless, the Surgeon-General\* has managed to develop an Army Medical Service. It consists of a few well-trained surgeons, placed at strategic points, and many partly trained officers. Most of his well-trained men are employed to teach first-aid assistants and to supplement the training of others. Thus medical officers have been marshalled in one way and another, and however inadequate the supply might seem, those

\* Lieut.-Gen. Lu Chih Chieh (anglicized to Dick Lu) is well trained, well informed, and resourceful. His headquarters are about ten miles outside Chungking. Here he has direct communication by telephone with each of the nine regular war areas of the Chinese Army. General Dick Lu is a graduate of Peking Union Medical College. After graduation he spent eight years working in the field of physiology. In 1935 he made a study of military medical establishments in America and Europe, spending six months of his time in England. He was recalled at the outbreak of war, and was made Surgeon-General in 1939.

in charge† of the British and American Medical Services during the Burma Campaign report that the performance of the medical corps in the Chinese Fifth Army at that time was remarkably effective under the most difficult conditions.

In another field the Army Medical Service has taken energetic steps to make up, so far as is possible, for the almost complete cessation of supplies from abroad:

A factory for instruments and hospital equipment has been built near Chungking. Here are turned out well-finished surgical instruments, stethoscopes, sterilizers, etc. Near by is an artificial-limb factory running to capacity. The prostheses, made expertly of leather and wood, seemed quite satisfactory. Amputations have been numerous, and 4,500 of the cripples have so far been fitted with artificial limbs, of which 80% have been made in the new limb factory. A still larger number of amputees continue to wait for their limbs.

Also in this vicinity is a herbarium of 200 acres, and there is a similar herbarium with larger acreage in another district. Thus the Army Medical Service is producing *digitalis folia*—said to be more than sufficient to supply the Army—pyrethrum (an insect repellent), *cannabis indica*, *stramonium*, *cascara*, *rhubarb*, and a few other drugs. They are producing *Saxifrageaceae* from which may be extracted a glucoside reputed to have an antipyretic and antimalarial action. Many drugs, of course, such as the sulphonamides, cannot yet be manufactured.

#### Problems of Military Medicine

At the present time, instead of war casualties being the primary consideration of the Army Medical Service, they take third place, after malnutrition and infectious disease.

Malnutrition comes first. This is not due so much to deficiency in calories, for the supply of partly polished rice is often adequate. It is due to deficiency in the protein, fat, and vitamins available to the Army. Vegetables are raised in some parts of China; meat is available in others. The difficulty of distribution arises from lack of transport facilities. Nevertheless, when this problem was discussed with Generalissimo Chiang Kai-shek he stated that the soldiers generally receive meat twice a week—a claim which can hardly be made for the population as a whole.

Next in importance after nutrition is the problem of infectious disease, and here the acute shortage of specific drugs is noteworthy. Malaria, of course, is prevalent in some areas, and they seem to have little quinine and less atabrin. Dysentery is frequent, and the supply of sulphaguanidine has been insufficient for adequate trial, although sulphanilamide is said to have been helpful. Typhus has had a relatively low incidence except at times in North China. Typhoid and relapsing fever have often presented serious problems, as have scabies, leg ulcers, and trachoma. During a period of 4½ years a total of 967,660 cases of sickness were analysed by the Surgeon-General from various units of the Army Medical Service Administration; 29% of these patients were suffering from infectious diseases, 13.6% from respiratory diseases, 20% from gastro-intestinal disease, and 17.6% from diseases of the skin.

Battle casualties were most numerous early in the war, and will be again, no doubt, when increased communication brings in supplies and enables the Chinese Army to take up offensive warfare. In 1937 the ratio of wounded to sick was 2 to 1 in the Army; in 1942 it was 1 to 4. Of nearly a million casualties subjected to analysis, 6.1% were suffering from injury to the head, 6.5% to chest, 6.6% to abdomen, 78% to extremities, and 2.5% to other areas.

Evacuation of wounded has always been difficult. It is carried out chiefly by man-power. Carriers can do 30 kilometres in a day, but the casualty-collecting points may be 20 to 50 kilometres behind the scene of action, and evacuation hospitals 100 kilometres. Consequently, many wounded perish without surgical treatment or are cared for and nursed back to health in farmhouses of the district. Blood-donor clinics do not exist, and blood derivatives for the treatment of shock are not available.

#### Auxiliary Medical Units

Very important aid is given to the Army Medical Service by Auxiliary Army Medical Units of various types. The surgeons in these units are better paid than the Regular Army medical

officers. They are moved about and placed at strategic points where the fighting is most active. Such units have been provided from the following sources: (1) the Chinese Red Cross, which has supplied by far the largest number; (2) the New Life Movement; (3) National Health Administration anti-epidemic teams; (4) E.M.S.T.S. units (emergency medical training schools, which have been set up at eight different points near the war areas, train medical aides and provide special courses for medical officers); (5) Friends Ambulance units; (6) British Red Cross unit. In addition to this, the mission hospitals, if near the battle area, have helped greatly and have played a most important part in the care of casualties from Japanese bombing raids.

#### The General Situation

Aside from military establishments, there are in Free China to-day about 15,000 hospital beds available to the public. These beds are made up roughly as follows (figures from Dr. A. Stewart Allen, formerly of Montreal, now of Chungking):

(1) National Health Administration (Chinese Government)	5,000
(2) Private Chinese hospitals (chiefly attached to medical schools or colleges supported to some extent by the Chinese Red Cross)	2,500
(3) Mission hospitals	7,500
Total	15,000

The mission hospitals receive their major support from the Chinese patients, who are admitted in categories of charity, semi-private, and private. The foreign staff, including doctors and nurses, receives financial support from abroad. But, in general, foreigners are being steadily replaced by newly trained Chinese.

The National Health Administration (N.H.A.)† concerns itself with the problems of public health, the control of epidemic disease, and the distribution of essential drugs. It has established county health centres, which serve a very useful purpose. However, this department is not charged with the care and rehabilitation of wounded soldiers, as in the case of its counterpart in Allied countries.

The Chinese have always taken pride in a high tradition of scholarship. It is therefore not surprising to discover that a considerable amount of medical research is being conducted under the adverse circumstances of wartime. Dr. Joseph Needham, British Scientific Mission, has surveyed the present situation in China in regard to scientific research. (*Nature*, 1943, 152, 9, 26, 64, 343, 372.)

#### Conclusion

Drugs, instruments, and, most of all, medical literature are badly needed now by physicians, medical teachers, and Army surgeons in China. But what the country seems to need more than anything else is medical men—not foreign physicians who cannot speak the language, but Chinese, trained in medicine at home or abroad—200,000 of them!

The problems faced so resolutely now by the Surgeon-General of the Chinese Army are similar to the problems faced by the National Health Administration to-day and to be met in the days to come. These problems will be of paramount importance in the period of post-war rehabilitation. Education is the field which presents the greatest opportunity for assistance. In this field, medicine should be given high priority to help China win her battle and establish herself securely as a great and independent nation.

† For a description of the work of this department and the general health problems of China see *China's Health Problems*, by Szeming Sze, Chinese Medical Association, Washington, D.C. (reviewed in *British Medical Journal*, Nov. 6, 1943).

R. E. Burger and C. B. Morton (*Surgery*, 1944, 15, 313) review the literature and record five cases of infection by *Torula*. In the first, one of torulosis of the central nervous system, the diagnosis was made at necropsy. In the second, a case of generalized torulosis, a diagnosis of Hodgkin's disease was made from biopsy material. In the third, a case of localized torulosis of the thigh, an apparent cure was effected by radical surgery and potassium iodide internally. In the fourth, a case of torulosis of the C.N.S., the diagnosis was made by smear and culture of spinal fluid. In the fifth, death was due to cerebrospinal torulosis.

† Major-Gen. Thompson, D.D.M.S., Bengal, and Col. Williams, Chief Surgeon to the American Forces in the China-Burma-India Theatre.



## BIRTHDAY MEDICAL HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in Supplements to the London Gazette on June 8:

*Order of Merit*

Sir HENRY HALLETT DALE, G.B.E., M.D., D.Sc., LL.D., F.R.C.P., President of the Royal Society.

*K.B.E. (Military Division)*

WILLIAM TYRRELL, C.B.E., D.S.O., M.C., M.B., B.Ch., A. Vice-Marshal R.A.F.

*Knighthood*

ERNEST ROCK CARLING, M.B., F.R.C.S., Consultant Adviser in Surgery and Adviser on Casualty Services to the Ministries of Health and Home Security.

WILLIAM ALLEN DALEY, M.D., F.R.C.P., Medical Officer of Health and School Medical Officer, London County Council.

ALEXANDER FLEMING, M.B., F.R.S., F.R.C.P., F.R.C.S., Professor of Bacteriology, University of London. Discoverer of penicillin.

HOWARD WALTER FLOREY, M.B., Ph.D., F.R.S., Professor of Pathology, University of Oxford. For services in the development of penicillin.

ALFRED CHAD TURNER WOODWARD, M.B., Ch.B., F.R.C.S., Chairman of the Worcestershire County Council.

*C.B. (Military Division)*

GILBERT ALAN BLAKE, M.B., K.H.S., Major-Gen., late R.A.M.C. STANFORD CADE, F.R.C.S., M.R.C.P., Acting Air Cmdr. R.A.F.

PHILIP HENRY MITCHELL, C.B.E., T.D., M.D., M.S., F.R.C.S., K.H.S., Col. (Temp. Major-Gen.), late R.A.M.C., T.A.

GORDON WILSON, C.B.E., M.C., M.B., K.H.S., Major-Gen. (local Lieut.-Gen.), late R.A.M.C.

*C.I.E.*

HERBERT EDWARD MURRAY, M.D., M.Ch., Lieut.-Col. I.M.S., Professor of Midwifery, Medical College, and Superintendent Medical College Hospitals, Calcutta.

*C.B.E. (Military Division)*

EDWARD BRUCE ALLNUTT, M.C., M.R.C.S., Col., late R.A.M.C. GRANT MASSIE, M.S., F.R.C.S., Lieut.-Col. (Temp. Col. local Brig.) R.A.M.C.

CHARLES JAMES SIDNEY O'MALLEY, M.B., B.S., Acting Group Capt. R.A.F.

RICHARD ALUN ROWLANDS, O.B.E., M.D., Temp. Surg. Rear-Admiral.

JOHN MURRAY WEDDELL, F.R.C.S., Col. (local Brig.) late R.A.M.C.

*C.B.E. (Civil Division)*

RICHARD CHARLES ALEXANDER, M.B., F.R.C.S., Ed. Surgical Director, Emergency Medical Service, Eastern Region of Scotland. Professor of Surgery, University of St. Andrews.

JOHN BLACK GRANT, M.D., D.P.H., Director, All-India Institute of Hygiene and Public Health, Calcutta.

ARCHIBALD HECTOR MCINDOE, M.Sc., M.S., F.R.C.S., Civilian Consultant to the R.A.F. in Plastic Surgery.

JOHN PHIMISTER MITCHELL, O.B.E., M.D., Colonial Medical Service, Medical Superintendent and Principal, Medical School, Mulago, Uganda.

WALTER PERCIVAL YETTS, O.B.E., D.Lit., M.R.C.S., Professor of Chinese Art and Archaeology, London University.

*O.B.E. (Military Division)*

MONAWAR KHAN AFRIDI, M.D., Major (Temp. Lieut.-Col.) I.M.S. VINCENT HENRY LUDOVICI ANTHOISZ, Lieut.-Col. Ceylon Medical Corps.

HAROLD JOHN BENSTED, M.C., M.R.C.S., Lieut.-Col. R.A.M.C.

WILLIAM DALE, M.R.C.S., Major (Temp. Lieut.-Col.) R.A.M.C.

CHRISTOPHER ROBSON DUDGEON, M.C., Major (Temp. Lieut.-Col.) R.A.M.C.

JOHN GERRARD HOLMES, M.D., Surg. Cmdr. R.N.

GEORGE MACKIE, M.D., Lieut.-Col. (Acting Col.) Worcestershire Home Guard.

GEORGE HENRY MORLEY, F.R.C.S., Wing Cmdr. R.A.F.

JAMES WALLS ROSS, E.D., Lieut.-Col. R.C.A.M.C.

HENRY ROBERTSON RUTTEN, M.D., Acting Temp. Surg. Cmdr.

R.C.N.V.R.

*O.B.E. (Civil Division)*

ALEXANDER MACANDREW GILLESPIE, M.B., F.R.C.P., Ed. Colonial Medical Service, Senior Specialist, Gold Coast.

Mrs. HELEN MARY TWINING, M.R.C.S., D.P.H., For medical services in Mauritius.

BERTRAM OSBORNE WILKIN, M.B., Ch.B., Colonial Medical Service, Medical Officer (Health), Tanganyika Territory.

*M.B.E. (Military Division)*

JOHN AMOS, M.B., Capt. (Temp. Major) R.A.M.C.

LINDSAY BARCLAY, Capt. (Temp. Major) R.A.M.C.

SAMUEL JOHN CHESLER, Major R.A.M.C.

ALDINGTON GEORGE CURPHEY, M.C., Major Jamaica Medical Corps.

MUHAMMAD ABDUL AZIZ KHAN GOHANAVI, Subadar I.A.M.C., Indian Army.

JAMES GEORGE KEEPER LINDSAY, Major R.C.A.M.C.  
MICHAEL WHITTAKER CARLTON OLDFIELD, M.B., F.R.C.S., Capt. (Temp. Major) R.A.M.C., T.A.  
JACK PENN, Temp. Major S.A.M.C.  
ELAINE MARGARET CATHERINE SALMOND, M.D., F.R.C.S., Capt. (Temp. Major) R.A.M.C.  
ATMA SINGH, Subadar I.A.M.C.

*M.B.E. (Civil Division)*

RAI BAHADUR SANTOSH KUMAR MUKERJI, M.B., M.R.C.P., Lecturer in Medicine, King Edward Medical School, Indore, Central India.

ABU ASHRAF MOHAMMAD WAJIB, M.R.C.S., Chief Medical Officer, Emergency Hospitals and Medical Supplies, Bengal.

*B.E.M. (Civil Division)*

SAVENACA VEIKOSO, Native Medical Practitioner, Fiji.

The honour of knighthood is to be conferred also on PERCIVAL HARTLEY, C.B.E., D.Sc., F.R.S., Director of Biological Standards, National Institute for Medical Research.

We print below the conclusion of the Birthday medical Honours List, published in a Supplement to the London Gazette on June 10:

*O.B.E. (Civil Division)*

NIGEL CORBET FLETCHER, M.B., B.Ch., Surgeon-in-Chief, St. John Ambulance Brigade.

ROY DYSON LANGDALE KELHAM, M.R.C.S., L.R.C.P., Principal Medical Officer, Ministry of Pensions.

JOHN ERNEST NICOLE, L.M.S.S.A., D.P.M., Medical Superintendent, Winwick Emergency Hospital, Warrington.

*M.B.E. (Civil Division)*

WILLIAM BLACKWOOD, D.S.O., M.B., Ch.B., Lieut.-Col. County Commissioner, St. John Ambulance Brigade, Cornwall.

HELEN STANORING, M.D., D.P.H., Senior Assistant Medical Officer of Health at Hull for Maternity and Child Welfare. For services to Civil Defence.

OSKAR TEICHMAN, D.S.O., M.C., T.D., M.R.C.S., L.R.C.P., Major. Local Army Welfare Officer, Southern Command.

## A NATIONAL MATERNITY SERVICE

A report on a National Maternity Service has been prepared on behalf of the Council of the Royal College of Obstetricians and Gynaecologists by the Maternity and Infant Health Services Committee under the chairmanship of the President, Mr. Eardley Holland. It is published this week by the College (58, Queen Anne Street, London, W.1) as a pamphlet, price 1s. 6d. Comment must be deferred to a later issue, but we print now the committee's summary and conclusions.

The practice of obstetrics (midwifery) must be considered on a broad national basis, in the light of the ideas and needs of to-day.

In the *Introductory Section* the present position has been described. It has been pointed out that the maternal mortality rate is still too high despite the fact that there has been a considerable fall in the last few years. We believe that the fall has been due not so much to improvement in the technical side of obstetric practice as to the application of new methods and drugs in the treatment of shock, haemorrhage, and sepsis, and to modern technique in the investigation and prevention of bacterial infection. We believe, also, that the fall has been helped by the increase in institutional midwifery, and the better planning of their maternity services by a number of local authorities. The stillbirth rate started to fall soon after the war began; the fall is slight and the reason for it is not yet clear. The neonatal mortality rate has been falling slowly for some years but is still too high. It is known that in some geographical areas and in some boroughs these obstetric mortality rates are much lower than the average, and in others the rates are much higher. There can be no reasonable doubt that the general application of the lessons learnt from a study of conditions existing where the rates are low would result in a considerable fall in all three and a rise in the general level of maternal and infant health.

In the *Social and Economic Section* we have stated the evidence that poverty—with its accompanying deficient nutrition, bad housing, and overcrowding—contributes greatly to stillbirth and neonatal mortality, and is not without effect on maternal mortality and morbidity. Moreover, it is very necessary to remember that when poverty and its accompaniments exist the technical services cannot function effectively.

Under the *Technical Services Section* we emphasize that in establishing the quality and maintaining the standard of a maternity and infant health service the technical side is dominant. The quality of the technical side depends first of all on the quality of the personnel—obstetric specialists, general practitioners, and midwives—as well as on their number, availability, and distribution.

We propose that the country be divided into maternity areas of a size capable of giving a complete service, and suggest areas yielding about 15,000 births a year as of suitable size for the purpose. We propose further that there should be large health regions based wherever possible on a university medical school, the maternity areas mentioned above becoming constituent areas of the large regions. In a region the service would be based on a key or primary centre, consisting of not fewer than 100 lying-in beds, with at least a third of that number of ante-natal beds, ante-natal and other clinics, a department for infants under a paediatrician, laboratories, teaching and research facilities. A key centre should, whenever possible, be part of a university medical school, and at the head would be an obstetrician of professorial status, whole-time and resident in the centre or nearby. The key centre would set the standard and supply the leadership and inspiration of the whole region. In an area the service would be based on divisional maternity centres, closely associated with the key centre, and at the periphery would be small local centres.

The whole service, in region and areas, should act as a single unit, with all parts integrated—maternity centres, ante-natal and other clinics, obstetricians, paediatricians, general practitioners, midwives, health visitors, home helps, laboratory services. We regard this principle of integration as absolutely essential for efficiency. The service, therefore, should be under a single administrative authority. We believe that the qualification for general practitioners to work in a National Maternity Service should be special and approved post-graduate experience.

One of the difficulties, to begin with, of working the sort of service we suggest is the shortage of well-trained personnel and their uneven distribution throughout the country. In London and most large towns there are enough obstetric specialists; in other areas and towns there are too few, and in still others there are none. Training centres must come before additional personnel can be trained. The university key centres would be the undergraduate schools; some of the divisional centres would be postgraduate schools and schools for midwives. The whole process would have to be gradually evolved until the standard of practice had been considerably raised, and could be undertaken by a select corps of men and women based on high-class maternity centres. We have no doubt that the wider application of knowledge, more and better personnel and institutions, and more efficient planning would greatly lessen the wastage of maternal and infant life and health, and would increase the health, happiness, and vitality of the nation.

us in which an infected eczematous area was treated by crude penicillin in a lanette wax and water base (containing 1 petroleum jelly) and was irritated by this preparation.—We are,

I. A. ROXBURGH.  
RONALD V. CHRISTIE.  
A. C. ROXBURGH.

### Sensitivity to Liver Extract

SIR,—I read with interest the article by Drs. McSorley and Davidson on sensitivity to liver extract (May 27, p. 714). My experience has in most respects been similar to theirs: nearly all the severe cases I have seen have been secondary—i.e., have occurred in patients who had been having liver injections for months or years. Twice they have occurred when the patient had to change the preparation used owing to her usual brand being in short supply. Once the allergic state is established the patient may be found sensitive to every preparation available or only to one or two.

I think, however, it would be a mistake to assume that most severe cases can be desensitized by the rush method employed by Drs. McSorley and Davidson. I have several times tried a method similar to theirs without success, to find later that the same patient was quite easily desensitized by injections given at daily intervals. The method I now employ is to put severe cases on a hog-stomach preparation while desensitization is being carried out, test the skin response to various dilutions of the liver extract to be used, and start with a dose well below that which causes a positive skin reaction. Unsuccessful attempts to desensitize may lead to a marked degree of hypersensitiveness. In such a case I have seen a well-marked allergic reaction to a dose of 1 minim of 1 in 100 solution of anahamin. The patient in whom that reaction occurred was, however, successfully desensitized over a period of two months, during which time he had a hog-stomach preparation daily and several blood transfusions.

Nearly all the patients I have seen exhibit severe reactions have been found on inquiry to have had minor symptoms following the previous injection. I think nearly all these severe reactions would be avoided if: (1) all patients at the beginning of liver therapy were instructed to report any unusual symptom noted to follow an injection—e.g., skin rashes or flushing, feeling of tightness in the chest, headache, vomiting; (2) any doctor changing a patient from one liver preparation to another gave a test dose of 0.05 c.cm. of the substitute preparation and waited 20 minutes before giving the full dose.—I am, etc.,

C. T. ANDREWS.

## Correspondence

### Penicillin for Skin Diseases

SIR,—We should like to reply to a few points raised by Majors Taylor and Hughes, whose letter we were interested to read in the *B.M.J.* of May 20 (p. 699).

When we started to use the spray technique in Nov., 1943, we felt that a quicker cure was one of the advantages it might offer, and that, if this was so, it would be facilitated by the use of a relatively strong solution. It was for this reason that we used a strength of 1,000 units per c.cm. We would not claim that this concentration is necessarily the best one for future use. Development, during treatment, of complete resistance to penicillin was not observed in any of our cases. In Cases 7 and 8 of our sycosis series there was, as stated (*B.M.J.*, April 15, p. 524), a lessening of sensitivity, but even so Case 7 recovered temporarily after further treatment. In Case 4 of the blepharitis series, although no sensitivity test was performed *in vitro* immediately before the use of the ointment was stopped, the condition cleared up rapidly when solution alone was applied to the lids. There is therefore no evidence to suggest that penicillin-resistant organisms were responsible for the deterioration of these cases, and indeed from the clinical point of view it was obvious that they, and Cases 5 and 10 of the sycosis series, were suffering from a chemical irritation of the skin, as distinct from an aggravation of the infective process.

The cases we described provide no direct evidence incriminating the petroleum jelly as the cause of irritation. Cases 5 and 10 of the sycosis series and Case 4 of the blepharitis series were eventually irritated by the penicillin ointment. The bad effect produced by the solution alone in Case 8 of the sycosis series tends to colour the view that it was some impurity in the penicillin rather than the petroleum jelly which caused the irritation. This is supported by a recent experience of one of

### Nutritional Oedema in a Vegetarian

SIR,—It does not seem necessary to ascribe the oedema in the case described by Dr. Holmes (May 6, p. 620) to myocardial weakness. The plasma proteins were well below the level at which oedema might be expected. This reduction of plasma proteins during the treatment of anaemia is due to the synthesis of haemoglobin at the expense of other body proteins (see Heath and Taylor, *J. clin. Invest.*, 1936, 15, 411).—I am, etc.,

London Hospital.

J. R. MARRACK.

### Ketosis in Children

SIR,—To obviate any further misconstruction of my remarks on this subject (*Journal*, April 8, p. 503) I would reply to the points raised by Dr. A. Cruikshank (April 29, p. 602) as follows:

(a) I did not say that these children were allergic to fats but that the commonest foods to which children are allergic are rather than the fat—as, for example, an urticaria to cod-liver oil usually occurs in a fish-sensitive child.

(b) Dr. Cruikshank has never experienced the occurrence of acidosis (or does he mean "ketosis"?) as soon as bacon fat or milk is added to the diet. The first case mentioned in Dr. Evans's original paper (*Journal*, March 25, p. 432) is one where such attacks were induced by the smallest quantity of milk, even after the fat had been removed.

(c) The relief obtained by injecting adrenaline in these cases bears no analogy to its effect in relieving hypoglycaemia due to an overdose of insulin, because when insulin is given it is probable that there is a big supply of glycogen present in the liver which only requires quick release and conversion into blood sugar. But the essence of these ketosis attacks is that they occur when the body's sugar and glycogen supplies have been depleted following emotion, exertion, or excitement, so that there is probably not much glycogen left to be converted into blood sugar by the adrenaline.

(d) The administration of alkalis in these cases has no biochemical foundation, as in general there is no "acidosis" in the true sense of the word, no acid change in the H-ion concentration of the blood, so there is nothing to be neutralized.

(e) Most of these ketosis attacks last only a few days irrespective of the treatment to a large extent, so Betty's response to the diet and administration of alkalis may have been coincidental and not necessarily the immediate result of the treatment. Let our treatment be prophylactic by finding out to what Betty is sensitive, and, if a food, give her an acid to help her digestion, and thus prevent further ketosis attacks during childhood and possibly migraine in later life, and so make her a different and better child and not "her sweet little self again"—that is, liable to further attacks.—I am, etc.,

London, W.1.

GEORGE BAY

### Symptomless Enlargement of the Oesophagus

SIR.—Dr. J. L. D'SILVA's case (June 3, p. 750) may apparently be classed with those of the rare "sigmoid" and "corkscrew" types of megaoesophagus discovered at necropsies after fall from height or other accidents or at x-ray examinations of the thorax made for various reasons, but not on account of any suspected oesophageal disease. The deformity seems to be developmental—that is to say, potentially, if not to some degree actually present at birth. But this view does not get us much further as to the causation. Predisposition does not imply the absence of causative factors, for veins of the lower extremities are often "predisposed" to become varicose, though no one would claim the absence of direct causative factors in such cases. Abnormal conditions of Auerbach's plexus may not be the only cause of megaoesophagus. There may even be some unknown general agent at work which in certain individuals acts selectively (i.e., with the effect of a general agent on local predispositions) on the oesophagus—just as in rare cases of acromegaly the excess of growth hormone may act selectively on the scalp, causing it to increase both in thickness and in breadth and length, so that in order to keep fitted to the skull it has to become furrowed (*cutis verticis sulcata* of acromegaly). In these cases of megaoesophagus, as has often been observed, the increase in length as well as in breadth causes the oesophagus to become bent or twisted.—I am, etc.,

London, W.1.

F. PARKES WEBER

### Aerial Convection from Smallpox Hospitals

SIR.—I am grateful to Prof. Ralph Picken and Lieut.-Col. P. G. Easton for their letters (May 20, p. 699) giving additional evidence in support of the theory of aerial convection of smallpox infection. Prof. Picken refers to Sir Alexander Macgregor's experience in the Glasgow epidemic of 1920-1. I may say that in the more recent outbreak of 1942 aerial convection from the Glasgow smallpox hospital provided—to those who accept the theory—a simple explanation of the connexion between the "ship's group" of cases and the "city group," otherwise almost inexplicable. Aerial convection also provided a simple explanation of the remarkable outburst in Leicester in 1903, when in the space of eleven days (after a lull of a fortnight without cases) 65 cases occurred in 61 houses in 58 streets scattered over two-thirds of the city (the district which escaped was the furthest from the smallpox hospital), and in 62 of the 65 cases not the slightest clue to the source of infection (apart from aerial convection) could be discovered. The 37 adults who went to work were employed in 32 different work-places, and 14 children attended 11 different schools. Obviously the "missed cases" theory is quite inadequate to explain such an outburst. As I said in my report on the outbreak, the infection appeared to have "dropped from the clouds." Since I have learnt from

my recent study of the subject how very strong the evidence in support of the theory is, I venture to say that is just where it did come from.

Now that we are learning the limitations of the protection conferred by infant vaccination, it is all the more necessary that every aspect of the problem of how smallpox is spread should be carefully studied. I hope, therefore, that those who may have thought that the theory of aerial convection had been exploded will reconsider the question.—I am, etc.,

Leicester.

C. KILLICK MILLARD.

### Strangulated Femoral Hernia

SIR.—The memorandum by Mr. D. K. Mulvaney (June 3, p. 751) affords an opportunity to refer briefly to two points in the operation. In the early case, if, after opening the sac, difficulty in reduction is encountered, the abdomen should be opened above the inguinal ligament, to expose and control the limbs of the loop. They are gently held by one hand. The bowel in the sac is held by the other. One has command now of the whole situation, because, by very gentle, sliding, to-and-fro movements of the hands, working together, the loop is safely delivered into the abdomen. This measure usually obviates any need to divide the constriction ring.

If, on opening the sac in the latter case, the bowel is non-viable and the decision made to perform a resection and anastomosis, how may this be safely performed and infection of the peritoneal cavity prevented? The infected contents of the sac are swabbed out. The herniated loop is delivered further and resected between clamps. The ends of the bowel are then closed with purse-string sutures, the clamps removed, and the ends of the sutures left long. The area is given a final toilet with saline or weak creosol lotion. The surgeon changes his gown and gloves and opens the abdomen above the inguinal ligament. The purse-string sutures are threaded up through the femoral ring, and thus the ends of the bowel are brought into the abdomen, delivered and anastomosed. These measures may be well known to some, but others will find them useful if they encounter this emergency.—I am, etc.,

Edinburgh

W. A. COCHRANE.

### Administration of Pentothal

SIR.—Dr. Montuschi (May 27, p. 731) has pointed out that many thousand intravenous anaesthetics will have to be administered in the next few months by relatively unskilled anaesthetists. For some time I have realized this and have endeavoured in teaching students at the Middlesex Hospital to give some fundamental rules, rather more comprehensive than Dr. Montuschi's excellent suggested admonition to limit the dose. I have recently published a synopsis of my undergraduate teaching on intravenous anaesthesia in the *Middlesex Hospital Journal*, March, 1944. If I may recapitulate the main points in your *Journal*, they may be of help to many temporary anaesthetists.

#### Technique of Injection

1. Never use a stronger solution of pentothal than 5%—i.e. 1/2 g. in 10 c.cm.
2. Use a 10-c.cm. capacity eccentric nozzle syringe. This size is handier to hold than a 20-c.cm. and by its size will limit any injection to 1/2 g. The eccentric nozzle makes venepuncture easier.
3. Use sharp, short-bevel needles.
4. Have your patient in a stable position, so that when he relaxes he will not slump into a new position.
5. Be stable and comfortable yourself; sit, stand, or kneel at your convenience; do not balance on one leg and support the patient's arm on the other knee, and do not bend down over a very low bed.
6. Test the intravenous position of your needle point by aspirating blood back before you inject.
7. Inject slowly, watching: (a) the patient for developing unconsciousness and continued respiration; (b) the needle point to be sure you are still in the vein; (c) the syringe to see how much you are giving.
8. Lastly, but most important, keep the airway clear.

#### Dosage

There is no fixed dose. The amount that each patient needs can be determined only at operation by his reaction to the drug as it is administered. While the first few c.cm. are administered slowly the patient should be watched, his reaction to simple questions noted until he is seen to be asleep. He has now had the sleep dose. He

will need for induction or any very short anaesthesia a total of at least twice the sleep dose. The initial injection should never exceed a total of three times the sleep dose. More pentothal may be necessary during the operation; each such subsequent injection should not exceed the sleep dose.

#### Shock

Extra care should be taken in shocked patients to determine the correct dose, which is always much smaller than in normal patients. Hattord (*Anesthesiology*, Jan., 1943) reports several fatal injections of 0.5 g. in shocked Pearl Harbour casualties, and I am not surprised. This shows that Dr. Montuschi's injunction is not enough. On the other hand, in the same volume of *Anesthesiology* Adams and Gray report successful extensive thoraco-abdominal surgery in a shocked woman, using repeated very small doses.—I am, etc.,

London, W.1.

F. W. ROBERTS.

SIR,—In his letter (May 27, p. 731) Dr. Montuschi gives advice to the occasional anaesthetist, should he wish to give pentothal during the coming months. This presumably refers to expected casualties when the great offensive is launched, and in that case I know that I shall not be alone in disagreeing with some of his suggestions.

In my opinion there are two definite scales of dosage of pentothal. One is for normal fit people, aged approximately from 18 to 40. The other is for everybody else, especially the anaemic, the debilitated, all elderly persons, acute obstructions, and casualties. The greatest risk of overdosage is with cases that have had repeated doses of morphine, or high doses. Bad R.A.F. casualties are good examples of the last-named, as they usually get morphine gr. 1/2 at the time of the accident (a practice with which I do not disagree). The dosage in the second group can be as low as one-tenth of that in the first group, and failure to appreciate this has undoubtedly led to loss of life. This principle should be fully explained to all students, who should have as great a respect for pentothal as I think they have for a spinal anaesthetic. Dr. Montuschi only refers to the first group, and as such his advice is sound. In these cases there is a considerable margin of safety, and if the occasional anaesthetist gives pentothal to these cases only he should get most satisfactory results; but to give "the whole of the small ampoule fairly rapidly" to the second group is sure to add to the already unnecessarily long list of pentothal deaths. I am sure that two people could be killed with that "small ampoule," providing they were bad risks.

It has been my lot to have to anaesthetize many serious casualties of all types, many of these being R.A.F. personnel. The only anaesthetic that I now give is (except for abdominal work, when I add a thoracic block) continuous pentothal, gas, and oxygen; but I am very convinced that one has to approach these cases very carefully. The keynote to safety is much oxygen and little pentothal. The worse the case the more certain I am that oxygen must be given before the pentothal, and that nitrous oxide should be introduced very slowly. The pentothal should be a 2½% solution and not the usual 5%; the rate of flow should be very slow. During the first five minutes it is wise not to give more than 1 c.cm. at a time. I have seen several cases lose consciousness on 1 c.cm. of the 2½% solution—i.e., 0.025 g. It would therefore not be surprising if such a case died after 3 to 4 c.cm. of a 5% solution given fairly quickly.

Let there be no hurry to reach deep anaesthesia. Many cases have yet to be undressed, etc., and for this very light anaesthesia is satisfactory. Nitrous oxide can be added if the colour remains good, but if it is less than good this should not be done. When adding N<sub>2</sub>O I start with a 50% mixture, and never go below 20% oxygen on a bad case. More pentothal is much safer.

I also feel strongly that no one should use pentothal unless he can perform the simple procedure of inflating the lungs with oxygen by pressure on the bag. Then, if at any time respiratory depression should follow the administration of pentothal, the patient can be kept a perfect colour in absolute safety until respiratory movements recommence. This is so easily done that the surgeon is unlikely to know that the patient has stopped breathing. I have no doubt that if this was more widely known and practised the intravenous barbiturates would have a cleaner record.

Finally, even in these days of wholesale spending, economy should matter, and as a large ampoule is almost the same price

as a small one, I see no reason why the anaesthetist should be advised "to forget the large one." What is left over from one case in a list can be used for the next case.—I am, etc.,

H. B. C. SANDIFORD,  
E.M.S. Anaesthetist, Region 12.

#### Post-anaesthetic Vomiting

SIR,—In an article recording painstaking research on the effect of nicotinic acid on post-operative vomiting (May 27, p. 719) the authors state that results were "not significant." This leads me to think that perhaps it is not generally known that post-operative or, as it should be termed, post-anaesthetic vomiting can be controlled in almost all cases by the oral administration of 5 to 20 minims of a solution of adrenaline chloride 1 in 1,000 in an ounce or so of water. A single dose is often sufficient, but it may be repeated with safety if required.—I am, etc.,

Leamington Spa.

BARBARA G. R. CRAWFORD.

#### Ether and the Oxford Vaporizer

SIR,—The article by Drs. Mushin and Wood on the effect of nicotinic acid on post-operative vomiting (May 27, p. 719) interested me as an example of the very valuable and original work that is constantly being carried out by the Nuffield Department of Anaesthetics.

I was, however, also interested in the light that this article inadvertently threw upon the actual incidence of post-operative vomiting after ether under the most favourable conditions. This series of 89 cases, admittedly uncomplicated, were anaesthetized by an expert using the Oxford vaporizer on its "home ground," and the admitted incidence of post-operative vomiting was no less than 74%! Truly "the cat is out of the bag"! The Oxford vaporizer is a very ingenious and excellent apparatus, which, to my mind, has only one disadvantage—namely, the fact that it delivers ether to the patient. Many writers in your columns have rightly eulogized the apparatus, but they have, almost without exception, been so overcome by their enthusiasm as to claim that the patients receiving ether through this medium were to a great extent spared those ill effects which are the inevitable aftermath of this anaesthetic.

The truth, as it is now revealed, confirms my own experience that ether unfortunately still remains ether even after passage through the Oxford vaporizer. It is a pity that the Oxford vaporizer was not designed twenty years ago. To-day the anaesthetist is rarely justified in submitting his patient to the discomforts and dangers attendant upon ether. It is to be hoped that the ingenuity and excellence of design embodied in the Oxford vaporizer will, before long, be put to better practical use.—I am, etc.,

Bournemouth.

S. F. DURRANS.

#### Bone-marrow Transfusion in Children

SIR,—We are particularly interested in the recent article on "Bone-marrow Transfusion in Infants and Children" by Dr. Janet Dr. Gimson (June 3, p. 748). In this hospital a great number of transfusions are given to infants and children of all ages from one day to sixteen years. The average number of such transfusions exceeds forty per month.

Intravenous technique appears to be considered a complicated and difficult procedure, but the resident medical officers here rapidly become extremely proficient and only a few minutes are required to set up a transfusion. It is our opinion that transfusions of all fluids are best given to the infant or child intravenously. Thereby the amount of fluid which actually reaches the circulation can be most intimately and directly controlled in the safest and quickest manner.

Dr. Gimson mentions "the haunting danger" of osteomyelitis. We feel this to be a very real one. Adequate skin preparation for an operation involving bone cannot be done when parenteral fluid is a matter of urgency. Why, therefore, should it be necessary to jeopardize bone when so simple an alternative is at hand?—We are, etc.,

R. DERHAM.  
M. A. HENDERSON.  
M. B. OAKDEN.

Alder Hey Children's Hospital, Liverpool.

## Death Rate from Peptic Ulcer

SIR.—I read with great interest Sir Henry Tidy's article in the *Journal* of May 20 on the death rate from peptic ulcer in Great Britain, 1912-38. It is a painstaking study which gives much food for thought. Somewhere in it he locked the secret of the aetiology of peptic ulcer. Several factors in the aetiology of peptic ulcer are undoubtedly involved. First, the rising age of the population. In 1937 there were 2,272 deaths from gastric ulcer in males (Registrar-General's Statistical Review, 1937, the last report available to me). The percentage distribution by age was as follows:

0	..	..	0.02%	40	..	7.5%
1	..	..	..	45	..	9.8%
5	..	..	0.4%	50	..	14.7%
10	..	..	..	55	..	14.4%
15	..	..	0.4%	60	..	13.5%
20	..	..	0.8%	65	..	10.7%
25	..	..	2.6%	70	..	7.1%
30	..	..	3.8%	75	..	7.8%
35	..	..	5.8%	80	..	2.2%

Therefore a large percentage of the mortality in males from gastric ulcer occurs at ages 40 to 70, especially 50 to 65. It is thus a disease of later life, and should be classed in its age incidence with cancer, diabetes, myocardial disease, and other degenerative diseases. The rising age of the population should result in increase of the gastric ulcer rate. A falling birth rate and saving of infant lives should show its effects after 30 or 40 years in increased figures for mortality from peptic ulcer. Why, then, the stationary rate 1912-21? There was a war (1914-18); there was the influenza epidemic, affecting males of all ages up to 55; there was dieting. Between the years 1909 and 1934 the intake of calories increased by 6%, but of animal fats by 25% (John Boyd Orr). This increase was interrupted in the war years, and after the war began to play its part.

But the question of the peptic ulcer is only a part of the larger question. The crude death rate per million in 1927 was 12,336, and in 1937 it was 12,419, an increase of 83 per million. But although the difference is comparatively slight, there were big falls in some diseases, balanced by big rises in other diseases.

Tuberculosis—a very steady fall till 1936 in all forms (972 per million to 695 per million); the only exceptions are genito-urinary tuberculosis, constant at about 7 per million; acute disseminated tuberculosis, constant at about 16.

Rheumatic fever	..	40 to 22	Bronchitis	..	849 to 436
Perniciosa anaemia (a steady fall from 1932)	..	68 to 55	Pneumonia	..	943 to 720
Meningitis	..	37 to 22	Inflammation of the stomach	..	35 to 15
Tuberculous	..	20 to 14	Diarrhoea and enteritis	..	158 to 120
General paralysis of the insane	..	39 to 21	Cirrhosis of the liver	..	47 to 30
Infantile convulsions	..	53 to 22	Diseases of pregnancy, childbirth, and the puerperium from 1934	4 41 to 3 13	
Valvular disease of the heart (a steady fall from 1930)	..	681 to 516 (in 1930)			

The following diseases show a definite rise:

Diabetes	..	126 to 178	Leukaemia	..	16 to 23
Osteo-arthritis	..	63 to 84	Lymphadenoma	..	12 to 15
Malignant disease	1,376 to 1,533		Paratyphoid	..	28 to 39
Diseases of the myocardium	..	772 to 2,040	Gastric or duodenal ulcer	..	101 to 112
(A steady rise due chiefly to myocardial degeneration)	..		Divericulitis	..	4 to 14
Exophthalmic goitre	..	24 to 41	Spina bifida and meningocoele	..	20 to 28
			Diseases of the prostate	..	159 to 243

Does this summary give cause for self-congratulation? Many of the falls in rates are due to better use of medical knowledge, applied to sanitation and food and treatment. Many of the increases in rates are due to the rising age of the population, but also to improved diagnosis, because there is registered a paradoxical fall in people dying of old age from 579 in 1927 to 414 in 1937. Where does our civilization go wrong? In food? In agriculture? Such are the questions raised by Sir Henry Tidy's article.—I am, etc.,

Southampton.

E. S. A. KOSCHANSKY.

## "Departmental Prescription"

SIR.—Why on earth do you keep on snarling at the Minister of Health? Your editorial on departmental prescription is the latest of a series of articles in which every effort of the Minister to plan and act for the benefit of the community is at best depreciated and at the worst so greeted as to try to make the public think that he is their worst enemy. The B.M.A. Council's suggestion that the health service proposals found their first inspiration in a desire to control an independent profession in order to control medical certification is most

offensive, and similar innuendoes are to be found in many of its criticisms.

You don't seem to realize that the Minister is working in the interests of the community, and that those of the doctors are of small importance in comparison. I quite believe that your view of these interests may be different from his, but you must give him credit for a single-minded belief that his proposals are in the public interest. After all, he is advised by expert medical men.

The pamphlet on diets for patients with peptic ulcer is to my mind perfectly harmless and very useful. It may refresh the minds of some doctors whose *B.M.J.s* pile up unopened in a corner of the surgery—there are many such, I fear—and besides contains many helpful hints on wartime variants of the essential dietary. I would welcome similar notes on, for example, the early symptoms of pulmonary tuberculosis in adults and children, and there are other subjects I could name where some such advice would be desirable. It is nonsense for you to call a Public Relations Department "in effect a Government advertising agency," and if certain doctors do not like such suggestions being made to them there is always at their elbows the W.P.B. They may do good and in any event can do no harm.

You carp, too, at the requirement for practitioners to submit to the local food office evidence of the necessity for special foodstuffs in certain diseases. It seems to me perfectly rational when the foodstuffs are in small quantity. Twice within the last month mothers of children with coeliac disease have asked me for certificates of stool analysis that their children may get a ration of dried banana. I had these analyses made three years ago, but the children are well on the way to recovery, and I refused the certificates, which means that the banana powder is available for two acute cases. Here again your attitude is a travesty of what it should be.

The Minister may be misguided, but at least you should give him credit for a whole-hearted desire to do his best for the commonality. Do, I beg you, cease to inflame the minds of the profession against him and his proposals. We were landed in a mess in 1911 by such counsels and came out of it with our professional tails well between our legs. I see with dismay and dread the same unreasoning opposition growing and the same debacle approaching. The whole is always greater than the part.—I am, etc

Conventry

W. FRASER ANNAND.

SIR.—How right you were to call attention to the ousting of Aunt Sally as the symbol of unpopularity in favour of the bureaucrat. Surely a much uglier phenomenon and a far more worthy target for brickbats!

The whole country appreciates the work of the Ministry of Food *qua* Ministry of Food in feeding our people under most arduous conditions during five years of war. But the Ministry of Food *qua* medical tutor magnifies its office, and should have reflected for a moment before issuing the leaflet on "Diets for Patients with Gastric and Duodenal Ulcers," which is more suitable for patients than for experienced practising medical men, who do not need to be told that curries and condiments are bad for such patients. Nor, strange though it may seem to the Ministry of Food, do they need to be told that proteins are body-building foods, etc.

It is noted that the Ministry does not advise administration of vitamin C in the form of ascorbic acid, which those of us who see and treat large numbers of such cases prefer to purées and other forms as being convenient and more effective. Fresh vegetables, however prepared, are bulky, apt to cause flatulence, and, at a time when all households are short-handed, require some amount of time and skill in their preparation. Moreover, the vitamin content is inconstant and depends on careful cooking.

It is observed from the leaflet Med. 1 that practitioners with large tropical experience, possessing special qualifications in tropical medicine, are not allowed to diagnose amoebiasis or bacillary dysentery, even though they may have isolated the parasites. They are required to call in the medical officer of health, who may be entirely without clinical experience of either, because only he is competent to certify. Neither are such practitioners considered capable of diagnosing sprue, even



though they may have seen and treated more cases than the whole of the "medical advisers" put together.

The position with regard to diabetes is interesting. Any practitioner is considered capable of diagnosing it, and no distinction is required between glycosuria due to low renal threshold and that which is truly pancreatic in origin. Is this due to omission or is it a complimentary gesture to the G.P.'s skill in clinical pathology?

Certain conditions in Schedule D of Med. 1 are reminiscent of the old quack medicine advertisements. They call for "detailed statements," blood-sugar estimations, lists of symptoms, description of tests carried out, and, in two cases, require "admission to a hospital for a few days at the patient's own expense," where the patient must undergo a "comprehensive test." If he is not prepared to do this he is denied the necessary article of food. All these clinical data are set down in writing and forwarded to the local food officer (!), who forwards them to the Ministry of Food, who submits them to "the medical advisers." When the Ministry of Food receives a "favourable decision" arrangements are made by returning the necessary documents to the local food office, but it is stated somewhere that there is any obligation on the latter to notify the patient that his prayers have been answered. Moreover, when the inevitable delay and procrastination inseparable from official correspondence are considered, some idea may be formed of the length of time this typical procedure is likely to take; and it must be understood that during the period of waiting no emergency interim issue of the food applied for is permitted.

In medical practice any doctor who professed to diagnose disease by correspondence without clinical examination would be regarded, and rightly so, as a charlatan and guilty of "inamous conduct in a professional respect." His chances of being struck off the *Register* would be quite favourable.

Bureaucrats, or as you prefer to call them "administrators," are becoming increasingly prone to interpose themselves between the doctor and his patient as the date for discussion of the White Paper approaches. They are playing a very dangerous game and they will be well advised to keep out of it. —We are, etc.,

H. M. STANLEY TURNER.  
A. C. DE B., HELME.  
JOHN REES.  
DAVID HALER.

Guildford Practitioners' Group.

### Character and Personality in the Medical Student

SIR.—Dr. E. D. Broster (May 27, p. 729) appears to be bewildered by the changing world around him, his bewilderment expressing itself in a disjointed cynicism.

He refers to the "apotheosis of the so-called under-dog" and the "belittlement . . . of eminence." He suggests that the attempts to enlarge the field of recruitment of doctors will add to the ration of "general bemusement." This is all due to the failure to grasp at fundamentals. Then he attempts to name a few of these, claiming at the same time that "millions of pounds are wasted annually in an effort to inculcate traits of character which are hereditarily non-existent . . . which are promptly and effectively annulled in any home where ignorance, stupidity, idleness, dirt, and vice are the pattern." If millions of pounds are in fact thus wasted each year, this statement must include a considerable proportion of the working-class homes of the country as those where ignorance, stupidity, etc., are the pattern. If it was not intended to include a large proportion of homes, then the amount wasted cannot amount to millions of pounds, so that the statement is either a curious condemnation of the standard of life and culture of the working class or else it is a meaningless exaggeration. In fact, it is doubtful if proportionately any more is wasted in trying to educate the working classes than in trying to educate those of a "certain high standard of living."

Your correspondent then claims that "if the laws of heredity have any validity at all . . . the most fruitful field of higher civilization is little likely to be found in the worst types of home." Again, "the Government, in obedience to the lowest amour, gives almost direct encouragement to the least worthy to reproduce themselves in the greatest numbers and a corresponding discouragement to their betters." Apart from the ques-

tionable accuracy of this last statement, there is implied another gross libel—that those of "a certain high standard of living" are "of the best stock," and "better" than those who have neither "wealth nor position" (this last term being admittedly a "dangerous side issue"). It is true that the wildness and scope of the generalization reduce its value; in fact, it is doubtful if it has any value at all, it being self-evident that in character, common sense, and general intelligence members of the "lower" working classes have few equals. Certainly you will never find a more burning desire for knowledge and culture among the more privileged classes than among the working classes, even if only because these are out of reach of the latter. Any attempt to classify those without worldly social advantage as inferior to those with them can only be the result of inaccurate observation and a peculiar idea as to what makes one superior or inferior.

Apparently Dr. Broster's fears arise because "the laws of heredity and breeding of the best stock are being ignored, and Nature flouted by man himself in relation to himself"; also because the Government is trying to produce a nation recruited from the "worst types of home," a policy which cannot end "but in the deterioration of the race." But this is not all. Even "eminent men not infrequently marry empty-headed women, and succeeding generations deteriorate." This is most alarming because, as Dr. Broster says, these are the very men who can arrest "the deterioration of the race." Furthermore, "individuality, personality, and character are being ironed out and gradually we become a race of automats." Finally, if you can face a further horror, ". . . the medical profession is to become the chattel of politics."

There is no more to be said. Evidently the ability to observe, think, and write clearly has been lost with the ability to "grasp at fundamentals."—I am, etc.,

Parke Frewett Hospital.

H. E. VICKERS.

### Colonial Medical Service

SIR.—I hope I am not too late to add my testimony to the good work and the efficiency of the Colonial Medical Service. I had the privilege of seeing something of its organization on the administrative side during my time in the Colonial Office, and of the quality of those who were accepted for the service. I have also seen it in actual operation in a number of Colonies, and during my visit to a mandated territory I came under the care of its personnel as a patient, when I received the very best care and skilled attention. Both doctors and nurses are a credit to the Service, and it is most unfortunate that an ill-considered and inaccurate comment on its merits should have been given such wide publicity.

The only fault of the Colonial Medical Service is that it is too small. In every territory its members are overworked, and are not sufficient in numbers to cope with the need. It has already established a fine tradition, and it only needs extension on the same lines to fit it more adequately for its great task. It is to be hoped that its members will be assured that the devoted and efficient service of its doctors and nurses is appreciated most by those who know best what has been and is being done.—I am, etc.,

London, S.W.1.

T. DRUMMOND SHIELDS.

SIR.—Perhaps I may be allowed to inform B.M.A. members that the absence of a reply from me in the *Journal* apropos of the attack on me by Lord Hailey and others does not imply my death or any weakness on my part, but is due solely to the fact that my rejoinder has been denied publication on the ground that it is "quite unsuitable for publication in our *Journal*—or indeed anywhere—on account of the violent personalities it expresses"! Apparently the ennobled and the knighted and one other can attack me with impunity, but censorship bars my reply.—I am, etc.,

London, N.W.6.

H. B. MORGAN, M.D., D.P.H., M.P.

Dr. R. E. G. Armattoc, director of the Lomeshie Research Centre for Anthropology and Human Biology, and honorary physician in charge of Brooke Park (E.M.S.), Londonderry, has been elected a Foreign Member of the American Association of Physical Anthropologists, and a Patron of the Free German Institute of Science in London.

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## OBITUARY

## Obituary

By the sudden and untimely death on May 14 of Dr. GUSTAV WEBER THOMPSON, Wellington, Salop, the profession in Shropshire loses, at a time when such can ill be spared, one of its doughtiest champions and most forthright spokesmen. After a distinguished career in India which gained for him the decoration of Commander of the Order of the British Empire, Thompson came to practise in Wellington some fifteen years ago, and during that time not only built up a fine practice but had become an acknowledged leader of the local profession. A keen committee man, he was a Freemason and Royal Society member of the council of the Shropshire and Mid-Wales Branch of the B.M.A., and a member of the County of Salop Police and Finance Committee; he took an active part in the management of most of the local medical charities and of the Wellington College Hospital. It was largely his initiative and energy that brought about, shortly after the outbreak of war, an amalgamation of the medical practices in the town of Wellington, an experiment in group practice that is likely to remain as a permanent memorial to its principal founder; in the early months of this year he took a prominent part in the reorganization of the town nursing services. Thompson's generous and energetic will be sorely missed, a certain brusqueness of manner and vehemence of speech cloaked a nature kind, sensible and generous; he was truly beloved by his patients, and many beside the writer know that they have lost a staunch and true friend.—W. R. H. P.

## Medical Notes in Parliament

Legislation on N.H.S.: No "Absolute Guarantee"

On June 6 Sir E. GRAHAM-LITTLE asked the Minister of Health whether, as he had postponed, *sine die* negotiations with the medical profession regarding the proposals of the White Paper, he would give an assurance that he would not introduce in Parliament any Bill dealing with these proposals until those negotiations were completed. Mr. WILLINK: I recognize that the discussions, which I am, of course, ready to start at any time, will have to be delayed owing to the postponement of the reasons connected with the war, of the proposed conference, the profession. My desire to hold these discussions before introducing legislation is in no way altered by the postponement, even though I am unable, in view of the many uncertainties, to give so absolute a guarantee as Sir Ernest Graham Little suggests in his question.

On June 8 Dr. HOWITT asked the Minister of Health, in view of the postponement of the Annual Representative Meeting of the B.M.A. at the request of the Government, to give an assurance that legislation on a national health service would not be introduced by him until after negotiations had taken place between him and the medical profession, bearing in mind that under its constitution only the Representative Body of the B.M.A. could determine the Association's policy. Mr. WILLINK said he could not give an assurance quite so absolute. It was said he could not give full discussions with the profession before introducing legislation. He saw no reason why he should be prevented from doing so by the delay which would be caused by the profession's inevitable postponement of its conference.

## Colonial Medical Service

In the House of Commons on June 6 Col. OLIVER STANLEY, Secretary of State for the Colonies, opened a debate on colonial administration and plans for the future. He said that the basis of the planning machinery he had tried to set up was, first of all, a colony development committee. That was now in force in nearly all the big Colonies. Its make-up must vary in each Colony, and it must include the heads of the various departments, because they were the people who would put up the detailed planning, it might be of health services or of agriculture. The important subjects of research and medical policy would have to be discussed on another occasion. Medical policy was the twin pillar of education in the new colonial foundation.

Col. Stanley said he wanted to refer to a recent speech made by Dr. Morgan, who was not in his place in the House that day. He had thought Dr. Morgan was so interested in

colonial development that it had never struck him that he would not be present. Therefore he had not given Dr. Morgan any notice that he would raise this matter, and he thought a wise compromise would be that he (Col. Stanley) should relate the facts and postpone the comments which otherwise he would have felt entitled to make. Dr. Morgan, speaking in quite another debate—that on the National Health Service—without any warning to him (Col. Stanley) and for no reason that he could see, and certainly for no reason that hon. members that gave, suddenly told the House—"I can tell hon. members that the Colonial Medical Service is a disgrace."

Of course, added Col. Stanley, they all knew Dr. Morgan who was, he always thought, rather like his famous medical predecessor, Dr. Jekyll. At times Dr. Morgan offered quite cogent and constructive suggestions, but there were intervals when his interjections were, to say the least of it, irrelevant and irresponsible. This occasion was a case with Dr. Morgan he would say, of the Hyde side out. Words spoken in the House went out to an immensely wide circle. Dr. Morgan's remarks went out with no explanation or justification, the caused, as he (Col. Stanley) knew, great bitterness of feeling among many people who were themselves affected in the matter, and there was no justification for them. The Colonial Medical Service had had many difficulties to grapple with, and had often been short-handed and short of funds, but that was not its fault. For the members of the Colonial Medical Service he had nothing but admiration and gratitude for their self-sacrificing efforts on behalf of the colonial territories.

Dr. HADEN GUEST expressed regret that Dr. Morgan was not present. He was a parliamentary and medical colleague of his, and it would have been better if Col. Stanley had quoted the exact words which were used. If Dr. Morgan had said that the medical services in many of the Colonies were—putting in a different adjective—very inadequate, he thought Col. Stanley would have thoroughly agreed with him. It was well known that the medical services were inadequate. He had discussed this matter with Dr. Morgan, and thought that that was really what he meant.

Col. STANLEY said that that might be so, but Dr. Morgan did not say it. His actual words were: "The Colonial Medical Service is one of the worst in the world. I represent the colonial doctors on the British Medical Association in certain parts of the world and I can tell hon. members that the Colonial Medical Service is a disgrace."

## The Services

Col. R. Errington, C.B.E., M.C., T.D., T.A., has been appointed an Honorary Physician to the King and Col. (Temp. Major-Gen.,) Sir E. M. Cowell, K.B.E., C.B., D.S.O., T.D., T.A., an Honorary Surgeon to the King in succession to Col. F. Whalley, C.B.E., D.S.O., T.D., and A. R. Moodie, T.D., late R.A.M.C. (ret.), respectively.

Col. (Temp. Brig.) J. C. A. Dowse, C.B.E., M.C., late R.A.M.C., has been appointed a J. M.S. with the acting rank of major-general. Temp. Surg. Lieut. J. J. Hood, D.S.C., R.N.V.R., has been mentioned in dispatches (posthumously) for gallantry in going to look for wounded below decks when a merchant ship was torpedoed.

## DEATHS IN THE SERVICES

Major-General HOWARD CARR, C.B., M.D., M.Ch., A.M.S. (ret.), died on May 23 at Southampton at the age of 80. He was educated at Queen's College, Cork, and took the M.D. of the Royal University of Ireland. He entered the Army Medical Service, as it then was, in 1884 and saw much active service during his long period in the Army. He took part in the Burma campaign of 1885-7, the Miranzzai expedition of 1891, the Dongola campaign of 1896, the Nile expedition of 1898, the South African War in 1900-2, and lastly in the war of 1914-18. During his active career he appears to have received seven medals and was twice mentioned in dispatches, and in 1915 he was awarded the C.B. for his good work in the responsible post of D.M.S. on the lines of communication in France. He retired in 1919, lived at Netley on Southampton Water, and indulged in his favourite sport of yachting as a prominent member of the Royal Southern Yacht Club.

## CASUALTIES IN THE MEDICAL SERVICES

Wounded.—Temp. Major R. Bolton, M.B.E., R.A.M.C.  
Prisoners of war.—Temp. Major H. M. S. G. Beadnell and War Subs. Capt. J. W. Goronsky, R.A.M.C.  
Prisoner of war.—War Subs. Capt. A. Berkeley, R.A.M.C.

the only possible dangers to his wife and prospective children are (1) that the father subsequently develops tuberculosis of the lungs and infects them; (2) in certain families there seems to be a poor resistance to tuberculous infection if it is met. From the information given there is no reason to suspect the latter. As it is six years since his contact died it is unlikely that the patient will develop pulmonary tuberculosis himself from this source. As safeguards, he could have his chest x-rayed each year, and should keep up a high standard of general health. No special precautions are necessary for the wife and children.

#### Treatment of Ringworm

**Q.**—What is the best modern treatment of ringworm of (a) the head, (b) the body in children? How long does it take to cure?

**A.**—Ringworm of the head—that is, the infection of the hair on the scalp in children—is best treated by x rays by the approved technique, a matter for the expert only. This is a mechanical procedure causing the diseased and healthy hair to fall out, thereby ridding the patient of the infection. It should be noted that ringworm of the head dies out at puberty, and that x-ray treatment is contraindicated in the inflammatory form of the disease. The hair has generally fallen out in four weeks, and when this has occurred complete cure may be assumed. The slight risk of permanent alopecia, usually limited to a small area, has to be taken into account. Acetate of thallium, given in one dose by the mouth, also a means of obtaining mechanical depilation, is not favoured in this country.

Body ringworm in children presents an easier problem because the fungus can be reached and destroyed by external agents. Three applications of the mild tincture of iodine are often curative in suitable cases; brilliant-green solution or gentian violet, 1%, provides an alternative. Daily application of a 3% benzoic and salicylic acid ointment cures in one to three weeks. It is essential to avoid over-treatment, which often misleads by producing a patch of traumatic dermatitis resembling the original lesion.

#### ? Pituitary Obesity

**Q.**—A man aged 27 has noticed a gradual increase in weight during the last four years, from 229 lb. to 248 lb., in spite of intermittent diets. His main complaint is that he is easily dyspnoeic. He has occasional dull headaches, but no vomiting or change in vision. Examination of the various systems reveals nothing abnormal except for generalized obesity. B.P., 160/80. Exercise tolerance test: 100, 164, 136. Dyspnoea, +. Glands normal. Skin smooth and moist. Radiological report: abnormally small pituitary fossa in relation to the skull. Diagnosis, pituitary obesity. Please advise regarding diet and endocrine therapy.

**A.**—The history is suggestive of an intracranial lesion in the neighbourhood of the third ventricle, and complete neurological and ocular investigation should be undertaken. If all investigations are negative, a diet of 800 calories daily, and thyroid extract by mouth to the point of tolerance, as judged by pulse rate, should be tried. Pituitary gland by mouth has no effect. The case should be reviewed periodically, even if investigations are negative.

#### Unusual Syndrome

**Q.**—A patient six months after a normal delivery, at the age of 25, developed a distressing urinary frequency accompanied by retching or vomiting. The latter stops at once as soon as the urine (usually a small amount only) is passed. The symptom is most marked in the early morning. Gynaecological and urological examination reveals no abnormality. At first there was loss of weight and asthenia as well, but these have improved. How should one treat such a case?

**A.**—This is an unusual combination of symptoms. The question cannot be answered without first arriving at a diagnosis. General medical examination, gynaecological examination under anaesthesia, cystoscopic, bacteriological, and possibly radiological examination are all indicated.

#### Smell and Sex

**Q.**—A young woman of 27, married, complains that her husband is very distressed on account of a strong, unpleasant smell which he notices at the time of intercourse. She herself does not smell anything objectionable and thinks the husband is "imagining." Another woman, 39, married, no children, says that her husband refuses to have intercourse for a similar reason. Both women are clean, healthy, bathing frequently and always before intercourse. Both husbands are healthy; there is no history of venereal or any other disease in either. What is the cause? What is the treatment?

**A.**—The question does not indicate whether the smell comes from the mouth, or from the genitals, or from the body. It is obvious that dental sepsis and gastro-intestinal disorders should be excluded, though they are unlikely to be the cause. All human beings give off some odour, usually imperceptible, but, judged by the performance of the bloodhound, quite characteristic for the individual.

Nevertheless, it is probable that the real explanation of the complaint is that given by one of the wives, who postulates that her husband is "imagining." Sexual intercourse in animals is closely associated with the functioning of the sense of smell, and infantile fantasies about sex are associated with the anus rather than with the vagina. An investigation of the husband's attitude to women and sex might prove illuminating and therapeutically helpful. Perfume has been used by women from time immemorial for the purpose of attracting the male, as well as for aesthetic reasons, and the use of scented bath salts might be of value as substituting something positive and pleasant for the unpleasant fantasy the man may have.

#### Malignant Prostate

**Q.**—A patient aged 60 had his prostate removed a year ago. He never regained proper use of his bladder, and 9 months later the surgeon who inserted a de Pezzer stated that the bladder was "half full of growth." He also had pain and marked weakness in one leg suggestive of a secondary growth in the spine. He received 1 mg. diethyl stilboestrol in oil intramuscularly for two months, and has received a tablet of the same strength since for six weeks. He has greatly improved and is no longer bedridden; he can walk two miles, the leg weakness having completely disappeared. Lately on taking his tablet of stilboestrol he has been troubled with rather severe pain in the neck of the bladder, and some drops of urine are simultaneously passed per urethram. What strength of stilboestrol should be administered and for how long?

**A.**—It is assumed that the prostate removed a year ago contained a malignant focus, and that there is some infiltration of the bladder neck. Although the patient complains that the pain comes on after taking his tablet of stilboestrol, it is unlikely that this is responsible for it. It is far more probable that the pain is due to bladder infection and the existence of growth. The administration of stilboestrol must be continued indefinitely. There is no advantage in giving it as an injection, as it acts equally well by mouth. He is receiving less than the usual dose, and two tablets a day should be tried. The indication for reducing the dose is usually soreness of the breast.

## LETTERS, NOTES, ETC.

#### First Aid

Col. C. M. FINNEY (Bearsden, Dunbartonshire) writes: The correspondence on this subject seems to be resolving itself into an argument between those who criticize the St. John first-aid manual and those who regard it as holy writ. Surely a practical outlook is required. Considering that the manual was last revised before the present war it has surprisingly few real errors, and is an excellent outline of the subject. But there appears little necessity for slavishly following all it contains. I have been giving lectures on first aid for many years both in and out of the Army, and have always tried to get the classes to realize that the subject is essentially a practical one, and to teach them methods which they are capable of carrying out under the conditions of total warfare. Anyone may be called upon to deal with a casualty, and should know what to do and what not to do. The study of first aid is to enable the student to help save life and limb, not to pass examinations. But a candidate who has a sound practical knowledge of the subject is not likely to fail in an examination, even if his answers are not strictly in accordance with the manual. Where the latter differs from what I consider to be the correct line of treatment I warn candidates that possibly a "book" answer may be expected by the examiner. Where instruction is given by a lay lecturer it may be wise for him to follow the manual, but I suggest that a medical man should be familiar with the latest advances in first-aid treatment, and should be able to give instruction to his class such as will enable them to be of real help to the community when called upon to deal with a casualty.

#### Byssinosis

Dr. JOHN C. BRIDGE (London, S.W.1) writes: In case any reader should imagine that the disease byssinosis is subject to compensation to workers in a woollen mill, as suggested in the answer on page 737 of your issue of May 27, may I point out that compensation is strictly limited to male workers in certain specified occupations employed in cotton card-rooms or other specified parts of factories engaged in the spinning of raw cotton and have been employed for periods amounting in the aggregate to not less than 20 years. No such disease has been described as occurring in workers in woollen mills.

#### Prevention of Industrial Dermatitis

Dr. N. HOWARD MUMMERY informs us that since the publication on May 13 (p. 660) of his memorandum on "Prevention of Industrial Dermatitis" he has received a large number of letters from doctors in industry asking where they can obtain the cleansing mixture to which he referred. Arrangements, he says, have now been made by which the mixture can be supplied on direct application to Messrs. Reynolds and Branson, Ltd., 13, Briggate, Leeds, 1.



LONDON SATURDAY JUNE 24 1944

## AN EXPERIMENTAL STUDY OF DIFFERENT METHODS OF ARTIFICIAL RESPIRATION

BY

A. HEMINGWAY, M.Sc., M.B., Ch.B.

*Professor of Physiology*

AND E. NEIL, B.Sc., M.B., Ch.B.

*Demonstrator in Physiology*

(From the Department of Physiology, School of Medicine, Leeds)

Two articles have appeared recently (Cordier, 1943; Eve, 1943) in which the criteria of efficiency of different methods of artificial respiration have been discussed. The aim of all methods of artificial respiration is agreed upon—it is the maintenance of respiratory exchanges in the nervous system. For this to take place two fundamental requirements must be fulfilled (a) adequate pulmonary ventilation; (b) transport of respiratory gases from and to the lungs. Cordier devotes attention to the first of these fundamentals, while admitting the importance of the other, and reviews the experimental evidence for the claims of efficiency made for Schäfer's, Silvester's, and the rocking (Eve's) method. He concludes, basing his judgment on lung-ventilation measurements, that the rocking method is not necessarily superior to other methods despite the claims which have been made for it. Eve reiterates the claim (Killick and Eve, 1933) that lung ventilation with the rocking method is equal to that with Schäfer's when measured in a normal subject voluntarily suspending respiration. It is also argued, chiefly on theoretical grounds, that the rocking method is likely to have a more beneficial effect on the circulation than Schäfer's method would have. Both authors, however, stress the necessity for further investigation into the effects of artificial respiration on the circulatory system and the transport of oxygen. Such investigations were actually in progress at the time of publication of those articles, and a preliminary account of them is given in the present paper.

It has been assumed that the fundamental fact to be considered in assessing the value of methods of artificial respiration is the amount of  $O_2$  which can be transported to and used by the tissues. Accordingly, the rates of  $O_2$  uptake, tidal air, ventilation volume, arterial blood pressure, and cardiac output have been measured with different methods of artificial respiration.

## The Animal Preparation

One of the greatest obstacles to the experimental investigation of methods of artificial respiration is the lack of a suitable experimental subject. Because methods of artificial respiration are usually required for their application to man, the human subject is the most desirable. But the use of an individual voluntarily suspending his respiration, or rendered apnoeic by voluntary hyperpnoea, is attended by many objections, which have been discussed by Haldane and Priestley (1935), Henderson and Turner (1941), and Cordier (1943), amongst others. The rigidity of the ordinary cadaver makes it an unsuitable subject, and it is easier to suggest the employment of the warm non-rigid cadaver of a previously healthy individual than to undertake it; nor is it possible to investigate circulatory conditions in these circumstances. Anaesthesia carried to the point of depressing the activity of the respiratory and vasomotor centres would appear to give an ideal condition for experiment, and Waters and Bennett (1936) and Macintosh (1943a) have recently described a near approach to it in experiments in which anaesthetized persons were rendered apnoeic, by forced ventilation, for a sufficiently long period to allow tidal air volumes to be measured under different methods of artificial respiration.

Since there did not appear to be any methods by which a suitable human subject could be employed for periods long enough to enable extensive measurements to be made on the cardiovascular system, it was decided to use dogs, either with a spinal transection made between the first and second cervical segments, or deeply anaesthetized with nembutal so that the medullary centres were inactive. For the latter preparation nembutal (1% solution in isotonic saline) was injected intraperitoneally until respiration ceased and arterial blood pressure fell to 50–60 mm. Hg. In either case artificial respiration was maintained by a pump except when manual methods were being investigated. Preparations of this type can be kept in good condition over long periods by artificial respiration, and it is considered that they offer good opportunities for comparing the efficacy of different methods of artificial respiration. The medullary centres are inactive and muscle tone is low.

Measurement of Tidal Air and Rate of  $O_2$  Uptake

Rates of  $O_2$  uptake and volumes of tidal air were obtained by a recording spirometer. A Y-shaped cannula was tied into the trachea and a positive-pressure artificial respiration pump could be switched in or out of the spirometer circuit by a system of taps.

## Methods of Artificial Respiration Employed

(a) *Pump Respiration*.—This was instituted immediately before making the spinal section or inducing deep anaesthesia, and the pump stroke was adjusted to give what appeared to be the normal ventilation volume, except when experimental procedures were being undertaken. The usual rate of the pump was 10.8 strokes a minute.

(b) *Abdominal Pressure Respiration (Schäfer)*.—The deep thorax of the average dog makes it an unsuitable subject for "prone-pressure" artificial respiration in the orthodox fashion; the prone pressure was unsuitable also for some of the experimental procedures undertaken. But with the dog supine, very firm pressure can be effectively applied to the abdomen and the viscera driven towards the thorax. It is considered that supine-pressure artificial respiration applied in this fashion is quite effective by comparison with prone-pressure respiration, and was abandoned (Schäfer, 1907–8) largely because of the danger of injury to the liver.

(c) *Rocking Method of Artificial Respiration*.—The animal was firmly strapped to a board by its limbs and stops were placed above and below the shoulders to prevent sliding. Rocking was carried out symmetrically about a horizontal axis through the centre of the board. The angle of rock was measured from the horizontal. A rate of 8 to 10 respirations a minute was usually maintained. So far as was possible the movement was made with a constant velocity, and stopping and starting was done fairly abruptly.

## Measurement of Arterial Blood Pressure

Arterial blood pressure was recorded from the carotid or femoral artery. Changes of pressure in the recording system due to alteration of the position of the cannula when rocking was instituted were avoided by using a compensating device.

## Measurement of Cardiac Output

*Application of the Fick Principle*.—Cardiac output was calculated from the formula:

$$\text{Cardiac output (ml./min.)} = \frac{O_2 \text{ uptake (ml./min.)}}{\text{Arteriovenous } O_2 \text{ diff. (ml./100 ml.)}} \times 100$$

The arteriovenous  $O_2$  difference was obtained from analysis of blood samples obtained by arterial and right ventricular puncture. Analyses were made in the van Slyke manometric apparatus. Right ventricular puncture was abandoned after a few experiments because of the technical difficulties during rocking, and subsequently samples of mixed venous blood were obtained by a catheter introduced through

the external jugular vein into the right atrium. Recently a photoelectric cell device, operated on the principle of Kramer (1935) and Appenheimer (1941), has been used for the estimation of the arterio-venous  $O_2$  difference. It has the advantage that 2-3 ml. of blood is withdrawn only temporarily from the circulation and long series of estimations can be made.

Observations

**Effect of Spinal Section on Rate of  $O_2$  Usage.**—After spinal section the induction of deep anaesthesia the rate of  $O_2$  uptake was usually reduced by 25-30%, and the arterial blood pressure had fallen to 40-50 mm. Hg when measurements were made 30-40 minutes later. These points are illustrated by Fig. 1.

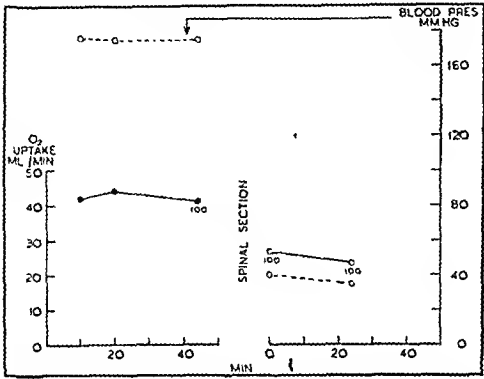


FIG. 1.—Rates of oxygen uptake and arterial blood pressure in an animal before and after spinal section.  
○—○ Natural respiration. ●—● Pump respiration (figures under points indicate volume (ml.) of tidal air).  
○—○—○ Arterial blood pressure.

**Relative Volumes of Tidal Air with Different Methods of Artificial Respiration.**—Using the pump for artificial respiration the tidal air volume is determined, within wide limits, by the stroke of the pump and need not be further discussed. When the Schäfer and rocking methods are compared the tidal volume is usually smaller with the former than with the latter. A typical result from some preliminary experiments performed with spinal cats was: tidal air volume with Schäfer's method, 16 ml.; with rocking, 24 ml. In a longer and more satisfactory series of experiments on spinal or deeply anaesthetized dogs a similar relation has been found in the large majority of experiments. In 10 out of 11 experiments the rocking method has given the greater volume of tidal air, and, taking the mean of all experiments, the tidal air with this method has been 54% greater than with Schäfer's. The difference between the tidal air in the two methods has been greatest when deep anaesthesia has been induced. In these circumstances muscle tone has been very low, and the forces responsible for restoring the volume of the thoracic cavity following the expiratory phase of the Schäfer have presumably been weak: the tidal air has often diminished progressively during the period of artificial respiration despite efforts to increase the respiratory pressure. Low muscular tone is not so likely to affect the volume of tidal air in the rocking method, because the diaphragmatic movements in both the inspiratory and the expiratory phases are impelled by the movements of the abdominal viscera. In this respect the experiments give support to the argument advanced by J. J. H. (1942).

**Comparison of Rate of  $O_2$  Uptake with Different Methods of Artificial Respiration.**—The usual course of an experiment was first to record the rate of  $O_2$  uptake with pump respiration. This was done during two or three periods, and pump respiration was then replaced by either rocking or Schäfer's method of artificial respiration. When the necessary observations had been made pump respiration was reinstituted, and after this the alternative method of artificial respiration was applied. In suitable preparations the whole procedure could be repeated. The results of a typical experiment are depicted in Fig. 2. The rate of  $O_2$  uptake with pump respiration was 23-27 ml./min.; artificial respiration by rocking gave a rate of uptake of 26.6 ml./min., and with Schäfer, 16.8 ml./min.

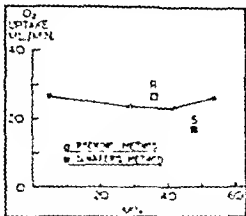


FIG. 2.—Rates of oxygen uptake. Comparison of artificial respiration carried out by pump, rocking, and Schäfer's method.

In some experiments the rate of  $O_2$  uptake with Schäfer's and the rocking method has been smaller than with pump respiration, as is shown in Fig. 3, but on only one occasion has the  $O_2$  uptake with Schäfer's method been greater than it was with rocking, although often there has been very little difference between them.

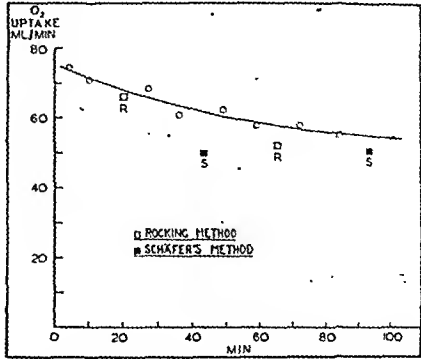


FIG. 3.—Similar experiment to that of Fig. 2, but showing gradual fall in oxygen uptake with pump respiration throughout experiment.

**The Significance of Tidal Air Measurements in Comparing the Efficacy of Methods of Artificial Respiration.**—Cordier (1943) observes that "the determination of ventilation is only one criterion in judging the efficiency of these methods." Observations of the type given in Table I show clearly that tidal air is not necessarily the determining factor in  $O_2$  uptake, for with very different tidal airs and ventilation volumes there may be similar rates of  $O_2$  uptake. For in this experiment, although tidal air volumes and ventilator volumes by the Schäfer method were only about 50% of those with the rocking method, there was little difference in the rate of  $O_2$  uptake.

TABLE I.—Tidal Air, Ventilation Volume, and  $O_2$  Uptake

Period	Type of A.R.	Tidal Air (ml.)	Rate per min.	Vent. Volume (ml./min.)	$O_2$ Uptake (ml./min.)
1	Rocking	125	10.0	1,250	54.0
2	Schäfer	62	10.0	620	50.0
			40-minute interval		
3	Rocking	125	7.6	950	43.0
4	Schäfer	58	10.0	580	43.3

Unless the alveolar  $O_2$  tension is allowed to fall so low that anoxia supervenes, alterations in the supply of oxygen by changing the tidal air and ventilation volume should not affect the rate of  $O_2$  uptake. That this principle can be applied to the spinal preparation under pump respiration is shown by Fig. 4.

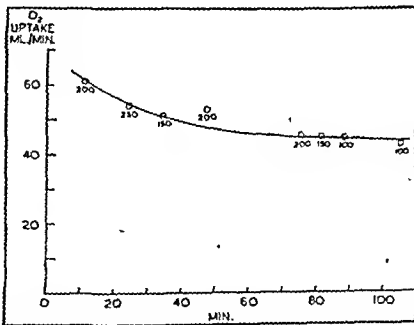


FIG. 4.—Rates of oxygen uptake with alterations in volume of tidal air in animal after spinal section. Figures under points indicate tidal air volumes (ml.).

In this experiment alterations in the volume of tidal air between 100 and 250 ml. had no effect on the rate of  $O_2$  uptake, which fell steadily throughout the experiment. But if, in similar experiments, the tidal air was reduced below a certain volume the rate of  $O_2$  uptake fluctuated with it, as is shown in Fig. 5. Rates of  $O_2$  uptake were measured before spinal section at three different volumes of tidal air, and varied according to the tidal air volume. After spinal section a similar relationship held although the rate of  $O_2$  uptake was lower, and a tidal air of 100 ml. was presumably sufficient to maintain an adequate alveolar  $O_2$  tension.

But it has been observed, in some experiments, that alterations in the volume of tidal air, induced by changing the method of artificial respiration, have been followed by disproportionate changes in the rate of  $O_2$  uptake. The results of such an experiment are given in Table II.

# STUDY OF METHODS OF ARTIFICIAL RESPIRATION

TABLE II.—Tidal Air, Ventilation Volume, and O<sub>2</sub> Uptake

Period	Type of A.R.	Tidal Air (ml.)	Rate per min.	Vent. Volume (ml./min.)	O <sub>2</sub> Uptake (ml./min.)
1	Pump	100	10.8	1,080	23.5
2	Rocking	94	8.4	789	26.6
3	Pump	100	10.8	1,080	23.2
4	Schäfer	73	10.0	730	16.8
5	Pump	100	10.8	1,080	25.8

The agreement between the rates of O<sub>2</sub> uptake during the periods of pump respiration suggests that the condition of the preparation was fairly stable, but respiration by rocking, although resulting in a slightly smaller volume of tidal air than with pump respiration, gave a higher rate of O<sub>2</sub> uptake. During respiration by Schäfer's method the volume of tidal air was reduced to approximately 78% of that with rocking, but the rate of oxygen uptake fell to 63%.

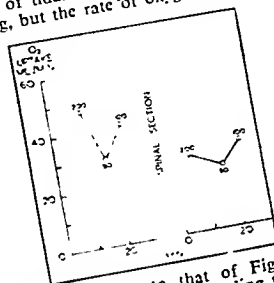


FIG. 5.—Similar experiment to that of Fig. 4, but showing changes in rate of oxygen uptake according to tidal air volume before and after spinal section.

It was clear from the results of this and similar experiments that if the effectiveness of artificial respiration methods was to be assessed in terms of the rate of O<sub>2</sub> uptake, factors additional to tidal air volume had to be considered. Some experiments seemed to show clearly that the O<sub>2</sub> uptake varied with the tidal air; others, such as those shown in Tables I and II, pointed equally clearly to the intervention of other factors. Of these probably the most important is cardiac output, and both Henderson (1937) and Schäfer (1903) make reference to it without, however, quoting any experimental evidence. Another section of this work deals with measurements of cardiac output under different conditions of artificial respiration and with the significance of the findings.

**Effect of the Angle of Rocking on the Volume of Tidal Air.**—Although the volume of the tidal air should not be taken as the sole criterion of the efficacy of a method of artificial respiration, it is necessary to know how the angle of rocking affects the tidal air volume if recommendations are to be made regarding the optimum rate and angle of rocking. Killick and Eve (1933) showed that a human subject voluntarily suspending respiration than rocking to 30°, and Macintosh (1943b) has recently made similar observations on an anaesthetized human subject rendered apnoeic by deep ventilation. In a dog, with respiratory activity suspended by deep barbiturate anaesthesia, the results of rocking to various angles were as shown in Table III.

TABLE III

Angle of Rock	Tidal Air (ml.)
30°	108
45°	156
55°	162

Rate of rocking, 9.5 per min.

Apparently, in the dog, the volume of tidal air is not increased significantly by rocking beyond 45° (see also Fig. 6), and since in the human subject rocking to this angle gives a tidal air similar to that in quiet respiration, it appears to be adequate for artificial respiration.

**Rate and Rhythm of Rocking:** (i) **Rate of Rocking.**—The effect on the tidal air and ventilation volume of rocking at various rates was determined. The results of a typical experiment were as given in Table IV.

TABLE IV

Rate of Rocking per min.	Tidal Air (ml.)	Ventilation Volume (ml./min.)
6.75	146	985
9.50	148	1,405
12.40	144	1,787
16.10	144	2,320

Angle of rock, 45°

The findings are not entirely in accordance with those of Killick and Eve (1933) on the human subject, for they reported that, although there was an increase in ventilation volume as the rate of rocking increased, the tidal volume is practically unchanged over the range of rates of rocking investigated. It seemed likely, having regard to the large ventilation volumes ensuing with high rates of rocking, that CO<sub>2</sub> might be "washed out" and the normal stimulus to breathing so removed. In a dog, lightly anaesthetized, it was found that a period of hyperventilation, either with a pump or by rocking, was followed by apnoea. The results of an experiment are given in Table V.

TABLE V.—Effect of Rate of Rocking on Ventilation Volume and Induction of Apnoea

Period	Type of A.R.	Rate per min.	Tidal Air (ml.)	Vent. Vol. (ml./min.)	Duration of A.R. (sec.)	Duration of Apnoea (sec.)	Rate of O <sub>2</sub> Uptake (ml./min.)
1	Natural	8-25	146	1,203	125	87	82.0
2	Pump	39-60	200	7,800	163	0	79.0
3	Rocking	9-50	145	1,378	135	20	82.6
4	"	12-40	145	1,935	145	27	86.7
5	"	16-10	166-146	2,510			

From the preceding considerations it is obvious that the ventilation volume while rocking should not exceed the normal resting volume if the danger of apnoea is to be avoided; with the human subject, if the usual volume of tidal air in the rocking method is taken as 500-600 ml., the rate should not exceed 10 a minute.

(ii) **Rhythm of Rocking.**—The rhythm of rocking—i.e., the rate between the duration of the inspiratory and expiratory phases—does not appear to be important in considering ventilation volume provided each is long enough to allow entry or exit of an adequate volume of air. The point will be discussed further, however, in connexion with the circulatory effects.

**Effects of Artificial Respiration on Cardiac Output.**—The object of any method of artificial respiration should be to maintain or increase the flow of well-oxygenated blood, at a suitable CO<sub>2</sub> tension, through the tissues of the body and, in particular, the brain. Although there is evidence of some vasomotor control of the cerebral vessels in the conscious or the lightly anaesthetized animal (Forbes and Cobb, 1938) it is likely in such cases, and almost certain when the respiratory and vasomotor centres have failed, that the cerebral flow is governed chiefly by the systemic blood pressure and, *ceteris paribus*, this will be determined by the effects on the cardiac output of a typical experiment in which the effects on the cardiac output of artificial respiration by positive-pressure pump, rocking, and Schäfer's method, respectively, were compared are given in Table VI.

TABLE VI

Period	Type of A.R.	Tidal Air (ml.)	O <sub>2</sub> Uptake (ml./min.)	Blood O <sub>2</sub> (ml./100 ml.)			Cardiac Output (ml./min.)
				Art.	Ven.	Arterio-ven. Diff.	
1	Pump	150	61.1	17.3	12.1	5.2	1,219
2	"	150	62.3	16.7	11.7	5.0	1,218
3	Rocking	104	53.8	16.7	11.2	5.5	979
4	Schäfer	75	56.4	—	—	—	—
5	Pump	150	61.1	17.3	12.1	5.2	1,219

In three successive experiments of this type the cardiac output with rocking was greater than with Schäfer's method, however vigorously the latter was applied (in one experiment post-mortem examination showed that the liver had been ruptured!); but in changes in cardiac output should not be considered alone but in conjunction with the accompanying alterations in the saturation of the venous blood. This was highest during rocking and lowest during the application of Schäfer's method. In general, the cardiac output, measured during relatively short periods of artificial respiration (5-10 min.) to give accuracy in comparison, has been about 25% greater with rocking than with the abdominal-pressure method.

Having established the superiority, under the given experimental conditions, of the rocking method in its effect on cardiac output, further inquiry was made into the effect of prolonged rocking, and of rocking to various angles. The results of an experiment are represented in Fig. 6. Measurements for the assessment of cardiac output were first made during a period when the animal was under light nembul anaesthesia. The anaesthesia was then deepened until the respiratory centre was completely depressed, and artificial respiration by the pump was instituted. During this stage the cardiac output was reduced to less than half of what it had been previously under light anaesthesia. Rocking was then started and maintained for 52 minutes, and the cardiac output compared at angles of rock of 30°, 45°, and 55°. Taking the output when the rocking angle was 45° as a standard for comparison, it is clear that the cardiac output increased steadily during the period; but the final response,

when rocking to 55°, indicates that the maximum output had been almost reached. It is important to notice, in assessing the effectiveness of the artificial respiration, that the output at the end of the rocking period and immediately before returning to pump respiration was only 17% less than during light anaesthesia. The rapid decline in the cardiac output to below the pre-rocking level when pump ventilation was restored shows that the increase in cardiac output was due solely to the rocking. The impossibility of assessing the effectiveness of artificial respiration solely by measurement of tidal air volume is also illustrated; for although, with one exception, the volume when rocking was less than the stroke of the pump, the cardiac output was almost double that with pump respiration.

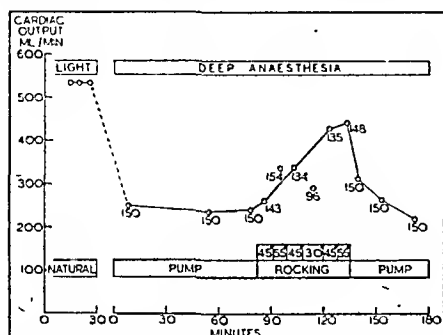


FIG. 6.—Effect on cardiac output of prolonged rocking and of rocking to various angles. Rocking to 30°, 45°, 55° for the periods indicated on the graph. Figures under points indicate tidal air volumes (ml.).

The percentage oxygen saturation of the mixed venous blood immediately before rocking was 46; at the end of the rocking period it had risen to 73, but 30 minutes after the cessation of rocking it had fallen to 53. Referred to a typical  $O_2$  dissociation curve for dog blood at 40 mm. Hg  $CO_2$  tension (E. Neil), these percentage saturations are found to correspond to oxygen tensions of 28.5, 47, and 32 mm. Hg respectively, and the effect of an increased cardiac output in providing a higher unloading tension of oxygen is demonstrated.

#### Discussion of the Effects of Artificial Respiration on the Circulation and of the Rhythm of Rocking for Maximal Cardiac Output

Only brief consideration can be given to the ways in which the methods of artificial respiration examined—Schäfer, rocking, and pump—affect the circulation. In each case the movements of the body wall and the diaphragm are passive; they are not due to muscular activity. In Schäfer's method the abdominal cavity and contents are alternately compressed and released. During compression the venous return is augmented by the emptying of the splanchnic vessels, but the entry of more blood into the abdominal veins is prevented by the rise in intra-abdominal pressure. When the compression is released and the intra-abdominal pressure falls the splanchnic vessels will fill again and tend to reduce the venous return. Blood-pressure tracings show an increase in mean pressure and a slight increase in pulse pressure during compression; the mean pressure falls abruptly by 10–15 mm. Hg when the compression is released, and the pulse pressure is diminished.

During rocking when the head-down position is assumed, there is emptying of the abdominal and hind leg veins by gravity. The diaphragm moves towards the thorax and the intra-abdominal pressure is diminished. There is no impediment to the flow of blood into the abdominal veins. Arterial blood-pressure tracings show a gradual rise in the mean pressure and an increase in the pulse pressure. When the animal is placed in the head-up position blood tends to accumulate in the abdominal and leg veins, although this may be opposed to some extent by the increase in abdominal pressure as the diaphragm descends. Judging by the pulse pressure, the increase in cardiac output in the head-down position is much greater than in the compression phase of Schäfer, and the *vis a tergo* continues to maintain the venous return during the head-up phase.

The accumulation of blood in the abdominal vessels is likely to be minimal if the duration of the head-up phase is as short as is compatible with the intake of an adequate volume of air into the lungs. According to the findings presented in Table V this can be less than 2 seconds without reduction in

the volume of tidal air. Experimentally, a 6-second respiratory cycle, divided into 4 seconds head-down and 2 seconds head-up has given good results, although a ratio of 3/2 seems slightly better. If the findings are to be applied to the human subject a 7-second cycle—4 head-down, 3 head-up—might be most suitable, taking into consideration the dimensions and inertia of the stretcher and subject, although Killick and Eve's (1933) results show that a tidal air of 500 ml. can be obtained a 13 rocks a minute.

Comparison of the effects on cardiac output of pump respiration with those of rocking or Schäfer's method provides no consistent conclusions. In some experiments, as in that yielding the results for Table VI, pump ventilation has been as effective as rocking in maintaining the cardiac output; in others—e.g. Fig. 6—the pump has been relatively ineffective in this respect. The explanation of these discrepancies is likely to be complex. Factors to be considered are the effects of lung inflation and collapse on the pulmonary circulation (Daly, 1930) and the extent and effects of diaphragmatic movement in different animals; but since they do not affect the comparison of the two manual methods they will not, at present, be considered further.

#### Commentary and Conclusions

It is clear from the results of the experiments which have been described that the oxygen uptake and effective transport during artificial respiration is not governed only by tidal air and ventilation volume. It is therefore impossible to assess the efficiency of different methods of artificial respiration by measurement of tidal air volumes if these differ by only small amounts. It is obvious that more attention should be devoted to an assessment of the circulatory changes which are induced by artificial respiration.

It is concluded that the rate of oxygen uptake and the cardiac output are usually greater with the rocking method than with the Schäfer; the  $O_2$  tension of the venous blood is higher.

The reasons for the differences in oxygen uptake with different methods of artificial respiration are not completely clarified. In any one case it would seem to be necessary to consider the following points: (a) Alterations in the tone of muscles due to stretch reflexes which would entail increased oxygen consumption. (b) If tissues are anoxic then increased oxygen supply to the part concerned might be followed by an increased uptake. (c) The higher rate of oxygen uptake with the rocking method than with Schäfer's method may be due, in part, to the increased cardiac output.

The heart rate in the spinal or deeply anaesthetized animal is constant, and alterations in heart output must be due to changes in stroke volume. In experiments employing the cardiometer, an increase in diastolic volume with rocking has been seen, and this will be associated with an increase in the rate of oxygen usage of the heart (Hemingway and Fee, 1927).

Finally, we are in full agreement with the view (*First Aid in the Royal Navy*, 1943) that the Schäfer method should be immediately instituted when resuscitation is undertaken, and that no time should be lost while preparations are being made for the use of any other method.

We wish to thank Dr. J. McMichael and Dr. A. Schweitzer for valuable suggestions made during the course of this work. A fuller report of the investigation, the expenses of which have been defrayed by the Medical Research Council, is being made to the Naval Personnel Research Committee of the Council.

#### REFERENCES

- Cordier, D. G. (1943). *British Medical Journal*, 2, 381.
- Daly, I. de B. (1930). *J. Physiol.*, 69, 238.
- Eve, F. C. (1943). *British Medical Journal*, 1, 535.
- First Aid in the Royal Navy* (1943). H.M. Stationery Office, London.
- Forbes, H. S., and Cobb, S. S. (1938). *Brain*, 61, 221.
- Gibbins, G. H. (1942). *British Medical Journal*, 2, 751.
- Haldane, J. S., and Priestley, J. G. (1935). *Respiration*, Oxford.
- Hemingway, A., and Fee, A. R. (1927). *J. Physiol.*, 63, 299.
- Henderson, Y. (1937). *Advances in Respiration*, Baltimore and London.
- and Turner, J. McC. (1941). *J. Amer. med. Ass.*, 116, 1508.
- Killick, E. M., and Eve, F. C. (1933). *Lancet*, 2, 740.
- Kramer, K. (1935). *Handb. Biol. Arb. Method.*, 5–8, 1085.
- Macintosh, R. R. (1943a). *British Medical Journal*, 2, 493.
- (1943b). Private communication.
- Pappenheimer, J. R. (1941). *J. Physiol.*, 99, 283.
- Schäfer, E. A. (1903). "Suspended Animation" Comm. Report, *Med. Chir. Trans.*, 85, Supp. 86.
- (1907–8). *Harvey Lectures*, 223. Philadelphia.
- Waters, R. M., and Bennett, J. H. (1936). *Anesth. & Analges.*, 15, 151.

# THE IMPROVED DENTITION OF 5-YEAR-OLD LONDON SCHOOL-CHILDREN

## A COMPARISON BETWEEN 1943 AND 1929

BY

MAY MELLANBY

(Nutrition Building, National Institute for Medical Research, N.W. 7)

AND

HELEN COUMOULOS, D.D.S., Athens

(Girton College, Cambridge)

### Historical

It is now established that certain nutritional factors play a prominent part in determining the structure of the dental tissues and their resistance to disease. Interest in this subject was first roused by the investigations on animals and children made by one of us (M. M.) which began in 1917 and have continued up to the present time.

### (a) Animal Experiments

It was shown in experiments on puppies and other young animals that perfect and imperfect teeth could be produced at will by small variations in the diet during the period of tooth development (Mellanby, 1918). The chief among these determinants were the fat-soluble vitamins, and especially vitamin D (which in the earlier days was called the calcifying vitamin). This substance acted in association with the calcium and phosphorus of the diet, and for optimum effect required a sufficiency of these elements; in the absence of vitamin D, even large quantities of calcium and phosphorus in the diet did not result in perfectly formed teeth and jaws. A deficiency of this vitamin in the mother's diet during pregnancy and lactation, especially with a low intake of calcium, caused the deciduous or milk teeth, and to a less extent the permanent teeth, of her puppies to be imperfectly calcified, even when, after weaning, their own food contained abundance of these substances; if the puppies continued on the same defective diet as the mother their permanent teeth were very badly formed—more so, in fact, than if the mother's diet during pregnancy and lactation had been good from the point of view of tooth development. It is seen, therefore, that the mother's diet during these periods may to some extent affect the teeth of her offspring for life.

In the living animal, teeth of perfect structure were translucent and felt smooth when their surfaces were rubbed lightly with a probe, whereas varying degrees of roughness were encountered when the teeth were of imperfect structure. It was shown that there was a close correlation between the surface appearance or texture of the teeth, determinable *in situ*, and their minute architecture as seen in microscopical sections made after death.

### b) Investigations on Children

When a large collection of children's shed and extracted teeth was examined and graded according to the standards developed and adopted by M. M. on the basis of the animal experimental work, perfect structure and all grades of imperfection were found, although some 80% came into the latter category. Teeth of good structure were on the whole found to be much less carious than those of defective structure, 8% of the former, compared with 6% of the latter, being caries-free. This relationship, however, did not necessarily apply to the comparatively few teeth with gross enamel defects obvious to the naked eye—forms of dental hypoplasia which used to be, and indeed still are, the only ones generally recognized.

From 1922 onwards a series of investigations on children in Sheffield tuberculosis hospital (1924, 1926, 1931, and 1934) and in three Birmingham Cottage Homes (1934) were made in co-operation with medical and dental colleagues. These investigations showed that those dietary factors which promoted well-calcified teeth also influenced them after full eruption and tended to retard to some extent the onset and spread of caries. Thus there was in the Birmingham study significantly less incidence and spread of caries in a group of children receiving additional vitamin D and olive oil than in the control group getting extra olive oil without the vitamin; for instance, in the permanent teeth already erupted at the beginning of the

investigation, an increase of only 8% of carious teeth was found in the vitamin D group in 2½ years, compared with 13.8% in the control group. Moreover, there was an even greater difference in those which erupted during the actual period of the investigation, the structure of which teeth may have been influenced by the diets (i.e., 7.6% of these teeth were carious in the vitamin D group, compared with 17.8% in the control group). In these series of investigations the most important dietary factors for delaying the onset and spread of decay were milk, cod-liver oil, and irradiated ergosterol (vitamin D<sub>2</sub>). With low vitamin D and calcium it was found that increasing the cereal content of the diet allowed the disease to spread more rapidly than in the controls with comparatively little cereal, probable reasons for this being that there are some anti-calcifying substances in cereals.

The above facts and many other experimental and clinical results were brought together in three special reports of the Medical Research Council published in 1929, 1930, and 1934 (M. Mellanby).

More recently these investigations on the initiation and spread of caries in children's teeth have been repeated and extended in different parts of the world (Anderson *et al.*, 1934; McBeath, 1932, 1934; McBeath and Zucker, 1938; McBeath and Verlin, 1942; McKee, 1930; Schiotz, 1937), so that to-day medical and dental clinicians as well as scientific investigators are realizing more and more that nutrition plays an important part in dental disease. They do not always, however, fully appreciate the long period during which dietetic factors must be operative in order to promote good dental structure and increase resistance to disease. For instance, they often expect results after a few months' administration of cod-liver oil, whereas the treatment should begin in early intra-uterine life and continue during the period of growth, and in a modified way probably throughout life.

The direct cause or causes of dental caries in human beings, as distinct from the predisposing factors, are not yet known, but in the work referred to above there was enough evidence to demonstrate that a great improvement could be obtained if the dietary of pregnant women, infants, and children were changed to one of higher calcifying quality. The teeth of the new generation would then be of better structure and less prone to decay. It seemed, indeed, that such a step must form the basis of any policy likely to lead to mass improvement of teeth—a point of view which has been constantly urged by one of us for many years. The dietetic changes advised were: (1) an increased consumption of milk, eggs, and other foods comparatively rich in calcifying factors; (2) a decreased intake of cereals, such as bread, oatmeal, and oatmeal preparations; and (3) the addition to the diet of cod-liver oil or some other source of vitamins D and A, especially the former.

### (c) National Dietary Changes related to Above Investigations

During recent years interest has become focused on public health in relation to food, and the Government has made a special effort to improve the standard of nutrition of pregnant women, infants, and young children. In the past quarter of a century antenatal clinics and infant welfare centres have been established in increasing numbers to advise on the feeding of both mother and baby. Rickets, so common in the 1920's and earlier, has become comparatively rare in England owing largely, no doubt, to the increased consumption of milk and to the greater therapeutic, as well as the prophylactic, use of cod-liver oil and other substances containing vitamin D. The condition of the teeth of the group of children examined in the present investigation could not have been greatly influenced by school feeding, since the majority did not go to school until they were 5 years old, though a few went to nursery classes or schools; but it is of interest to remember that as long ago as 1906 the London County Council made official arrangements for the supply of school dinners to necessitous children, and in 1910 milk and cod-liver oil could be supplied to children whose home conditions were unsatisfactory or when malnutrition was threatened or present. In addition there were an increasingly large number of other children receiving milk, on payment, as the result of voluntary school milk clubs. Only in 1934, however, when the Milk Marketing Board was set up, was a scheme put into operation to supply milk (at first one-third of a pint and later two-thirds of a pint a day) to children, irrespective of their physical condition, in any part of the



country at the reduced rate of  $\frac{1}{4}$  d. per one-third pint bottle, or free in necessitous cases.

With the war have come other advances: cheap milk, cod-liver oil, and orange juice, and a priority of eggs, have become available to all pregnant and lactating women, to infants, and to young children. Dinners are provided at most schools, and their quality has been greatly improved; their provision no longer depends on financial or medical necessity, but has been developed as part of the Government's wartime food policy, and many parents take advantage of the scheme. Calcium carbonate has been added to bread (7 oz. to 280 lb. of flour), and the nutritive value of all margarine has been improved by the addition of vitamin D<sub>2</sub> and vitamin A.

#### (d) Reasons for Present Investigation

While these steps have been taken with the object of bettering the general nutrition of the community and especially of guarding against diseases of childhood such as rickets and concomitant ills, it is obvious that the changes in the dietary are in the main those which the animal and human investigations mentioned above have shown to be necessary for improving the nation's teeth. It seemed of considerable interest, therefore, to see whether there was any evidence that such an improvement had in fact taken place. Fortunately, it was possible to make an inquiry into the question which would provide an answer so far as children attending L.C.C. schools are concerned, for in 1929 a dental examination of some 1,300 unselected 5-year-old children (i.e., children who had not yet come under the full influence of the school dental service) in these schools was made by one of us (M. M.) for the Board of Education. The surface structure of the enamel and the presence and extent of caries in each tooth were recorded; later some of the findings, together with other records made on the same children, were published by the Board of Education (1931). By using the same criteria and examining the same age group attending these schools to-day it would therefore be possible to see what, if any, improvement had taken place in the intervening 14 or 15 years.

Dr. W. Allen Daley, the School Medical Officer to the London County Council, was approached, and the Council's permission to carry out an investigation was readily given.

#### The Present Investigation

When any school visited in 1929 was closed or was no longer used as an infants' department, one or more other schools in the same neighbourhood, as near as possible to that previously inspected, were taken as substitutes. In addition, a few schools in other districts were visited, but they are not included in the main tables.

In 1929 the schools were divided, with the help of the local Care Committees, according to their level in the social scale. For the purpose of the present investigation, therefore, the Care Committees were again approached, and after consultation they made a rough classification into four grades: but they could not guarantee that their groupings were comparable with those made in 1929, which were indicated by the signs B+, B, B-, and C. Moreover, there is now a greater mixing in the schools than hitherto of children from families of different social and financial levels. This is due to many causes, including the clearance of slums and the building of large blocks of flats, the transference of families from one area to another owing to destruction of homes from enemy action, evacuation schemes, etc. Then, again, the financial status of many families has been altered, either raised or lowered, as a result of the war.

In the present survey the dental examinations were shared by us, the majority of children being inspected by H. C. From time to time during the course of the survey, and especially at the beginning, the teeth of many children were examined separately by both investigators, the two records being compared so that as far as possible the same standard would be kept; this was especially necessary for the grading of structure, in which the personal factor plays a prominent part. We were in agreement in most cases; where differences did occur they were generally small.

Detailed examinations of all teeth were made for signs of M-hypoplasia (see next paragraph), gross hypoplasia (the generally recognized varieties), and caries. Other conditions of the teeth, including their alignment, the presence of mottled enamel, and the state of the gums, were noted, but are not considered in this paper. Since results of the 1929 investigation were given as percentages of children showing varying degrees of hypoplasia and caries, similar figures will be given here. A more detailed analysis of our findings will be published later.

#### (a) The Structure of the Teeth

The standards used for structure were similar to those adopted in the 1929 Board of Education survey, which were evolved from the results of the investigations referred to above. Individual teeth were taken to be of normal or perfect structure when their surfaces were smooth and shiny, like those of the teeth of puppies given a mixed diet relatively rich in vitamin D and containing the necessary calcium and phosphorus. Teeth showing imperfections of surface structure were classified into three grades: slightly defective, defective, and very defective. These types of defects will be referred to as M-hypoplasia, a term first used by J. D. King in 1940 to distinguish them from the previously recognized gross or G-types, which are rarely seen in deciduous teeth. The M-type defects were originally described by M. Mellanby (1923, 1927, 1934), who found that some 80% of 1,500 deciduous teeth were so affected.

The surfaces of the teeth with M-hypoplasia show varying degrees of roughness which are not always visible to the naked eye when the teeth are *in situ*, but can easily be detected when their surfaces are lightly rubbed with a probe; the degree of roughness as indicated by the "feel" of the probe can be judged with practice. A sufficiently reliable clinical assessment of the enamel surface texture is obtained if the test is confined to the buccal aspect of the teeth. When each tooth had been considered separately a general computation was made for the structure of all the teeth of a given child, keeping so far as possible to the method of assessment used in the 1929 investigation but dividing the children into only four groups instead of seven: Good structure, Little M-hypoplasia (1 and 2), Some M-hypoplasia (3 and 4), and Much M-hypoplasia (5 and 6). The figures in parentheses refer to the 1929 grouping. The few cases of gross hypoplasia were included in Group 4.

Although 1,604 children were examined in the main survey and included in the caries incidence tables, 33 of them had lost too many teeth for it to be possible to classify for structure, reducing the number for this purpose to 1,571.

In Table I the structure of the teeth in the two investigations is set out. It is clear that in the 14 years that have elapsed the

TABLE I.—Incidence of M-hypoplasia in Deciduous Teeth

	Total Number of Children	Percentages of Children Showing:			
		None	Little	Some	Much
1943	1,571	1.2	18.1	47.4	33.3
1929	1,139	0	7.8	33.6	58.5

picture of deciduous tooth structure has changed for the better. Even so, there are very few children with a full complement of perfectly calcified teeth; however, in 1943 18.1% had only slight M-hypoplasia, compared with 7.8% in 1929, and there were fewer with much M-hypoplasia—33.3% as against 58.5% respectively.

In Table II the findings are given when the schools are divided according to their estimated social status. There are no great

TABLE II.—Incidence of M-hypoplasia in Deciduous Teeth at the Different Social Levels

Social Grading of School	Total No. of Children	Percentages of Children Showing:			
		None	Little	Some	Much
Highest grade (B +)					
1943 .. ..	190	0.5	25.8	49.0	24.7
1929 .. ..	133	0	12.8	30.8	56.4
2nd grade (B)					
1943 .. ..	582	1.0	14.8	50.2	34.0
1929 .. ..	423	0	9.9	36.4	53.7
3rd grade (B -)					
1943 .. ..	556	1.8	18.0	45.1	35.1
1929 .. ..	190	0	4.7	30.0	65.3
4th grade (C)					
1943 .. ..	243	0.8	20.2	44.9	34.2
1929 .. ..	393	0	5.4	33.3	61.3

differences in these groups in 1943, although the tendency is for the highest-grade schools (B+) to have teeth of rather better structure than the schools in the other three grades, which differ little on the whole. In 1929 there was a suggestion that the quality of structure was worse in the lower-grade schools.

#### (b) Incidence of Dental Caries

For the grading of caries each tooth was examined by probe and mirror and put into one of four categories, as follows:

*No caries* that could be diagnosed as definite caries by our methods of examination: (No radiographs were taken.)

*Slight caries*: Very early and suspected fissure and approximal caries.

*Moderate caries*: Cavities involving destruction up to roughly one-quarter of the tooth crown.

*Advanced caries*: Destruction of more than one-quarter of the tooth crown.

## IMPROVED DENTITION OF LONDON SCHOOL-CHILDREN

in the Subsidiary Survey

Fillings and arrested caries were classified very roughly according to the extent of the crown involved and included as carious. If deciduous molars or canines had been lost it was assumed that they had been extracted for advanced caries, since they should normally be present at the age under review.

When each tooth had been graded separately the children were divided into four groups according to the total amount of caries present: the method of assessment used was as nearly similar to that of 1929 as possible. No caries, Little (1 and 2), Some (3 and 4), and Much caries (5 and 6). The figures in parentheses relate to the 1929 classification, when seven groups were distinguished instead of four.

Table III gives a comparison of the relative amount of caries for the two investigations: 22.4% of the children in 1943 were "caries-free," compared with 4.7% in 1929; and only 29.3% had much

TABLE III.—Incidence of Dental Caries in Deciduous Teeth

	Total Number of Children	Percentages of Children Showing*			
		No Caries	Little Caries	Some Caries	Much Caries
1943	1,604	22.4	25.9	22.4	29.3
1929	1,293	4.7	11.7	20.8	62.8

\* Only 6% of the children in this category in 1943 would correspond with the C6 group (very bad caries), compared with 54% in 1929.

caries, as against 62.8% previously. Actually the improvement is even greater than these figures suggest, because in 1943 only about 6% of those in the "Much" caries group could be classed in the C6 category (very bad caries), compared with 54% in the earlier investigation, which included a number of edentulous children. No amount of caries varied considerably from one school to another; in 1943 the percentages of caries-free children ranged from 5 to 37 and of "Much" caries from 50 to 11.5. In 1929 the comparable figures were 0 to 15.4% and 79 to 19%, respectively.

Table IV indicates that in 1943 there was distinctly less caries in the B+ schools than in the other three grades, which differed little among themselves. In 1929 there was a slight tendency for the amount of caries present to increase from the better to the poorer schools.

TABLE IV.—Incidence of Dental Caries in Deciduous Teeth at the Different Social Levels

Social Grading of School	Total No. of Children	Percentages of Children Showing*			
		No Caries	Little Caries	Some Caries	Much Caries
Highest grade (B+)	193	29.5	28.5	21.2	20.7
1943	147	6.1	17.7	15.6	60.6
1929	596	20.8	27.7	22.0	29.5
2nd grade (B)	480	6.5	11.3	22.6	59.6
1943	569	22.9	23.6	21.1	32.5
1929	210	3.8	10.5	22.9	62.8
3rd grade (B-)	569	19.5	25.2	27.2	28.1
1943	210	2.8	10.5	19.5	67.1
1929	456				

among themselves. In 1929 there was a slight tendency for the amount of caries present to increase from the better to the poorer schools.

## (c) Subsidiary Survey

As already mentioned, a subsidiary survey was made of several schools in districts not visited in 1929. The findings are therefore given separately. The amount of hypoplasia was about the same as that found in the schools in the main survey, but there was less decay: 35% of the children had no definite caries.

TABLE V.—Incidence of M-hypoplasia in the Subsidiary Survey

Social Grading of School	Total No. of Children	Percentages of Children Showing*			
		None	Little	Some	Much
Highest grade (B+)	134	0.8	12.7	61.9	24.6
1943	128	0	14.8	46.1	39.1
1929	262	0.4	13.7	54.2	31.7

The schools all came into the B+ and B- categories. In the former, 135 children were seen, of whom 40.7% had no definite caries and only 11.1% had "Much" caries. The teeth of the 131 children

\* There are children included in this group in whom very early caries was present in two or three teeth, and whom to-day we should probably prefer to include in a separate group between caries-free and little caries; but the standard here used is that adopted in 1929, when so few children were seen with anything approaching a caries-free mouth.

TABLE VI.—Incidence of Dental Caries in the Subsidiary Survey

Social Grading of School	Total No. of Children	Percentages of Children Showing*			
		No Caries	Little Caries	Some Caries	Much Caries
Highest grade (B+)	135	40.7	25.2	23.0	11.1
1943	131	29.0	19.1	25.2	26.7
3rd grade (B-)	266	35.0	22.2	24.1	18.8

in the B- schools were not as good from this point of view as those in the B+ schools, but nevertheless 29% of the children were "caries-free" and 26.7% had "Much" caries. The percentages of "caries-free" children in the individual schools ranged from 27 to 44 and those with "Much" caries from 38 to 8.

## (d) Arrest of Caries

In the Sheffield investigation carried out by one of us (M. M.) in co-operation with Dr. Lee Pattison, and referred to above, a striking feature noted in groups of children having a good calcifying diet was the relatively high proportion of decayed teeth in which the caries was no longer active—in other words, in which the caries had become arrested. Many of these children were examined at regular intervals over long periods, and it was found possible to trace the gradual arresting of the carious process. It is therefore significant that in the present survey typical arrest was found in at least some teeth of 28% of all the children with caries.

## (e) Association of M-hypoplasia and Caries

A close association exists between the quality of a tooth and its resistance to decay, as has been mentioned above. To assess this relationship accurately it is necessary to consider individual teeth, but it was thought that a rough indication might be obtained by correlating the structure of the teeth and the amount of caries per child, taking for this purpose only those cases in which no canines or molars were missing. None of the few children with perfect teeth and under 5% of those with nearly perfect dentition were placed in the two worst categories of caries, whereas 38% of the children with "Much" hypoplasia had also "Much" caries and only 8% were "caries-free." It is interesting to note that 34% of those with "Some" hypoplasia had no caries and 40% had "Little"; this suggests that some post-eruptive influence (direct or indirect) was at work, though it must be borne in mind that these children were under 6 years of age and the molars still had a long period in the mouth in which they might become carious.

## Discussion

The data obtained in this survey show clearly that there has been a distinct improvement since 1929 in the dental condition of 5-year-old children attending London County Council elementary schools. The quality of the teeth is now better; in 1943, 19% of the children had teeth of good structure, compared with 8% in 1929, while the percentages with very defective formed teeth (i.e., teeth with "Much" M-hypoplasia) were 33 and 58 respectively. The reduction in the incidence of dental decay is even more striking: in 1943, 22% of the children were "caries-free," compared with 5% in 1929, while only 29% had "Much" caries in 1943, as compared with 63% in 1929. When the schools were grouped according to social status there was little difference in dental condition as regards both structure and caries between the various grades, though the teeth tended to be rather better in the highest-grade schools in 1943 and in the two highest grades in 1929.

These observations, however, do not show whether the improvement is of recent occurrence or whether it has been gradual in this social stratum of London during the past 14 or 15 years. Since, however, the teeth of the 1943 5-year-old children were in the main formed in the immediate pre-war years and the first year of the war, the cause of the improvement in these particular children must be sought among factors operative at and since that time and contrasted with the conditions in the previous survey were developing. Can the improvement be attributed to the changed dietary referred to earlier, which has increased the intake of vitamin D and calcium by the provision of cheap milk and of cod-liver oil to infants and young children, together with the addition of vitamins D and A to the margarine and of calcium carbonate to the bread or is it due to other unknown influences which have been brought to bear on child life in London during these years? No categorical answer can be given to this question, because there still remains much to be discovered not only about the relation of nutrition to dental conditions but also about the

immediate cause of caries. All we can do in attempting to answer the question is to argue from established knowledge and see to what extent this explains the observations.

It is known that the structure of the deciduous and permanent teeth of young animals is affected by the diet during their period of tooth development, both *in utero*, during lactation, and especially after weaning, when much greater defects in dental structure of the offspring may result from diets poor in calcifying properties. The mother has a large quantity of calcium in her bones and sometimes stores of vitamin D in her body; these substances she undoubtedly sacrifices to some extent to her offspring when she herself is deficiently fed, but these offspring will have little or no stores of vitamin D after weaning, so that a poor calcifying diet taken at this time very soon exerts its baneful influence. The same principle probably applies in the case of the child, and it is therefore very important that the pregnant and lactating woman, and later the infant itself, should have diets rich in the factors necessary for the production of well-calcified teeth.

The experimental evidence that dental structure is largely controlled by the ingestion of enough vitamin D, calcium, and phosphorus is so strong that it is difficult to avoid the conclusion that the improvement in dentition of the 1943 children has resulted largely from the changes in dietary in the immediate pre-war and early war period. If this is the case, and if mothers and children are taking and continue to take full advantage of the additional improvements in dietary that have been placed at their disposal during the last year or two, it seems safe to predict that children's teeth now being formed will be even better than those of the children seen in the 1943 survey.

While, therefore, the reason for the improvement in dental structure seems clear, the cause of the reduction in dental caries is less certain. Since M. M.'s early investigations on children's teeth showed that those of good structure were less liable to caries than those of poor structure, and since the structure of the teeth in this survey was better than in 1929, some reduction in the amount of caries was to be expected from this cause alone. The reduction observed, however, was greater than could be explained on this basis, so that some other contributory factors were evidently at work.

Investigations carried out by M. M. and her colleagues and others have shown that the dietary factors which promote well-calcified teeth also tend to retard the onset and spread of caries, apart from their influence on structure. The dietary of the young children in the 1943 survey has been improved from this point of view even beyond the standard reached during the immediate pre-war period and early part of the war, when their teeth were being formed, and it is considerably better than the dietary at the corresponding period in the lives of the 1929 group of children. It might be surmised, therefore, that the reduction in caries in 1943 as compared with 1929 is due in part to the better structure, which is related to better calcifying dietary, in part to the post-eruptive influence of the even better dietary condition of the war years, and possibly in part to other unknown changes. What these other factors are that may share the responsibility for the diminution of caries in these children can only be conjectured. Some would say that changes in the carbohydrate intake or the fluorine intake or of food consistency, or a greater use of the toothbrush have played a part. Unfortunately the basis of these suggested factors is too insecure at the present time to allow their effects to be assessed adequately.

If the present national food policy has been responsible, as seems likely, for much of the improvement of the teeth here reported, this only emphasizes the importance of still greater efforts on the part of central and local government in the same direction, for even to-day 78% of these 5-year-old children have some decayed teeth. Parents must be taught to realize that the consumption of milk and vitamin D is a *sine qua non* for improvement of the teeth of their children, and they must be induced to co-operate more willingly in this health-giving project. Much has already been done by the staffs of welfare centres, school medical and dental officers, Care Committee workers, and teachers; but unfortunately there still remains a fair proportion of parents who, for one reason or another, fail to take full advantage of the dietary supplements at their disposal.

The facts emerging from this investigation can be regarded as heartening and as providing evidence that we are at last taking steps in the right direction to attack successfully the most widespread of the ills of civilized man. Florid rickets—the cruder manifestation of defective calcification—has been virtually eliminated in England by better feeding of pregnant and lactating women, and of infants and children. It is possible that the elimination of dental caries may not be attainable until its immediate cause is known, but even without this knowledge it is probable that a continuation and extension of the present nutritional policy and its more whole-hearted adoption by the public would bring about further improvement in the architecture of teeth and in their subsequent resistance to decay. It would then at least be possible to present to dental surgeons a situation which they could tackle hopefully.

### Summary

The results are given of two large-scale dental surveys of 5-year-old children in the same or comparable schools of the London County Council in 1943 and 1929.

During the intervening period a great improvement has taken place both in the structure of the deciduous teeth and in their resistance to decay. (a) 19% of the children had teeth of perfect or nearly perfect structure in 1943, compared with 8% in 1929, and only 33% had very defectively formed teeth (i.e., teeth with much M-hypoplasia), compared with 58% in 1929. (b) In 1943 22% of the children were, according to the standards used, "caries-free," compared with about 5% in 1929.

That there is still great room for improvement in dental condition is demonstrated by the fact that even at the present time between 56 and 95% of children in individual schools visited in the two surveys had dental decay in at least some of their teeth.

It is thought that the observed improvement in the dental condition of this age group may be largely due to the changes in feeding habits which have been developing in recent years—in particular to the introduction in 1934 of the cheap milk scheme of the Milk Marketing Board and later to the wartime food policy, which included (a) increased allowances of milk together with cod-liver oil and fruit juices to pregnant and lactating women, to infants, and to young children; (b) the addition of vitamins A and D, to margarine; and (c) the addition of calcium carbonate to bread. These are dietetic changes that investigations on animals and children carried out by one of us (M. M.) since 1917 have established as essential for the improved dental condition of the general child population.

Our thanks are due to many people who have helped us directly or indirectly with this investigation. These include: the London County Council and Dr. W. Allen Daley for their permission to carry out the inspections, for making the necessary arrangements at the schools, and for their kind interest in the progress of the survey; the Care Committee Organizers for grading the schools and for other valuable assistance; and Miss Irene Allen for general help, and especially for working out the results given in the tables. Last, but by no means least, we want to thank the head teachers of the infant schools and their assistants, without whose willing and interested co-operation the work would have been impossible. H. C. holds a scholarship from the British Council, and other expenses were paid by the Medical Research Council; to both of these bodies we are very grateful.

### BIBLIOGRAPHY

- Anderson, P. G., et al. (1934). *J. Amer. dent. Ass.*, 21, 1349.  
Board of Education (1931). Committee on Adenoids and Enlarged Tonsils. Second Interim Report: *The Association of Rickets and Dental Disease with Adenoids and Enlarged Tonsils*, London.  
Dental Disease Committee (1936). *Med. Res. Cncl. Sp. Rep. Ser. No. 211*, H.M.S.O., London.  
King, J. D. (1940). *Ibid.*, No. 241.  
McBeath, E. C. (1932). *J. dent. Res.*, 12, 723.  
— (1934). *Amer. J. publ. Hlth.*, 24, 1028.  
— and Zucker, T. F. (1938). *J. Nutr.*, 15, 547.  
— and Verlin, W. A. (1942). *J. Amer. dent. Ass.*, 29, 1393.  
McKeage, R. H. (1930). *Brit. dent. J.*, 51, 281.  
Mellanby, M. (1918). *Lancet*, 2, 767.  
— (1920). *Dent. Rec.*, 40, 63.  
— (1923). *Brit. dent. J.*, 44, 1.  
— (1927). *Ibid.*, 48, 737.  
— (1929). *Med. Res. Cncl. Sp. Rep. Ser. No. 140*, H.M.S.O., London.  
— (1930). *Ibid.*, No. 153.  
— (1934). *Ibid.*, No. 191.  
Pattison, C. Lee, and Proude, J. W. (1924). *British Medical Journal*, 2, 354.  
— (1926). *Brit. dent. J.*, 47, 1045.  
— (1928). *British Medical Journal*, 2, 1079.  
— (1932). *Ibid.*, 1, 507.  
Schiotz, C. (1937). *Norske Tandlaegefor. Tidsskr.*

In an address to the Conference of the Children's Nutrition Council (Wales) at Cardiff on May 13, Mr. Eddie Williams reminded his audience that the object of the Council was "to ensure that no child, by reason of the poverty of its parents, shall be deprived of at least a minimum of food and other requirements necessary for full health." He strongly advocated the institution of school meals throughout Great Britain.

# POLIOMYELITIS IN BRITISH AND AMERICAN TROOPS IN THE MIDDLE EAST

THE ISOLATION OF VIRUS FROM HUMAN FAECES

BY  
JOHN R. PAUL, M.D.\*  
W. P. HAVENS, jun., M.D.\*  
(M.C. 1151)  
AND  
C. E. VAN ROOYEN, M.D.  
(M.C. 1151)  
Middle East Forces

Van Rooyen and Morgan (1943) called attention to poliomyelitis as a military disease in the Middle East. Since 1940, cases of this disease among British troops have not been uncommon; many have been severe, and a high percentage have been fatal. From several of these fatal cases (occurring in 1942 and 1943) the virus of poliomyelitis has been isolated by them from the central nervous system, and the properties of some of these strains have also been studied by Schlesinger (1943) in the United States. The present report is concerned with a series of attempts to isolate poliomyelitis virus from the stools of typical (and borderline) cases of poliomyelitis, which occurred during 1943 among British and American troops stationed in the Middle East—particularly in Libya, Egypt, and Palestine. The tests have been undertaken to determine: (i) their local value as a confirmatory diagnostic procedure; and (ii) whether these adult cases (which have occurred for the most part sporadically) harbour the virus in the intestinal tract in the same manner as do juvenile cases in areas where the disease is more apt to be epidemic.

## Prevalence of Poliomyelitis in the Middle East

From the onset of this work we have been concerned with the circumstances under which this peculiarly severe type of poliomyelitis has occurred in civilian as well as military populations of the Middle East during recent years. In Egypt there is a dearth of published information on this point. Reports to the Egyptian Ministry of Health appear inadequate, for only a few cases—nearly all of them fatal—have been listed during recent years. Thus in the year 1938 the Egyptian Ministry of Health reported, for all of Egypt (16 million people), only 1 case of poliomyelitis, with 2 deaths; and in 1939, 8 cases and 8 deaths. To supplement this information we have obtained data from two prominent Cairo paediatricians,† who

TABLE I.—Incidence of Poliomyelitis at the Children's Hospital Dispensary, Cairo\*

Year	New Cases	Total New Patients Admitted to Dispensary	Approx. Rate per 1,000 Admissions
1933 .. ..	71	58,000	1.2
1934 .. ..	74	73,000	1.0
1935 .. ..	24	77,000	0.3
1936 .. ..	48	100,000	0.5
1937 .. ..	22	110,000	0.2
1938 .. ..	96	116,000	0.8
1939 .. ..	41	122,000	0.3
1940 .. ..	149	148,000	1.0
1941 .. ..	110	160,000	0.7
1942 .. ..	201	165,000	1.2

\* Data kindly furnished by Prof. Shawki.

agree that poliomyelitis is "not uncommon" in Egypt—a fact which becomes evident from a glance at Table I, which gives the number of new cases seen annually at the Children's Hospital Dispensary of Cairo.

\* From the Neurotropic Virus Disease Commission (Board for the investigation of Influenza and Other Epidemic Diseases in the Army, Preventive Medicine Service, Office of the Surgeon General, U.S. Army).

† We are indebted for this information to Dr. Ibrahim Shawki, Professor of Paediatrics, Faculty of Medicine, Cairo; and Dr. Edouard Debbas, Physician-in-Chief for Diseases of Children at the Israeli Hospital in Cairo.

Data in this table indicate a fairly high endemic rate for poliomyelitis in the civilian population of Cairo: probably it is greater than hitherto suspected. There have been fluctuations from year to year, but the disease has not appeared in epidemics during this period. Furthermore, in contradistinction to the experience in temperate climates, it is more of an all-year-round disease in Egypt, with maximal incidence in March, April, and May, and again in October.

Information about the civilian age groups involved is scanty, but most of the cases listed in Table I have been in patients under 5 years of age. Poliomyelitis in the native Egyptian adult seems to be rare, and from verbal accounts no cases have been seen recently at the Military General Hospital in Cairo. The local juvenile cases have usually been mild and severe bulbar cases rare. Prof. Shawki has seen only 2 cases of severe acutely ascending paralysis in local children.

In Palestine some information has been published by Levy (1937), who concluded that there, also, poliomyelitis was not uncommon, in that for the 20-year period 1915–34 he was able to collect from the records of orthopaedic dispensaries and physicians a series of 215 paralytic cases. From these data he estimated the average incidence of poliomyelitis to be only slightly lower than that of the United States! On the other hand, it was not common among the large native Arab population, the highest prevalence being among Jews (12.3 per 100,000)—an average rate 25 times that noted among Moslems. Seasonally, as in Egypt, there were two periods of increased incidence—one in May and June and another in October and November. And, again as in Egypt, the disease was largely one of infants—85% of the cases being recorded in children under 4 years of age. Adult cases were not mentioned.

This is the present setting in the Middle East, where many cases have occurred among British troops. To quote from van Rooyen and Morgan's report: In 1941 a total of 74 cases were notified as acute poliomyelitis or encephalitis in the M.E.F., and of these 19 were fatal; in 1942 there were 32 cases, with 14 deaths. The rate among American soldiers stationed in the Middle East (during the first 10 months of 1943) has been more than 10 times that recorded in the United States (see Table II) for a similar period of time.

TABLE II.—Poliomyelitis Rates per 1,000 in the U.S. Army

Year	In the Middle East	In the United States
1940 .. ..	—	0.02
1941 .. ..	—	0.02
1942 .. ..	7	0.03
1943 .. ..	0.425*	0.03†

\* To Oct. 1, 1943. † To Sept. 12, 1943.

## Clinical Epidemiology

Contacts and living quarters were investigated in 10 military cases of poliomyelitis or polio-encephalitis, which were probably acquired in Cairo between May 1 and Oct. 15, 1943. The cases were ubiquitous as to their place of origin. No two patients seemed to have been in contact. No civilian cases were discovered among adults or children living in close proximity to the patients' quarters. This does not mean that epidemics of poliomyelitis do not occur in the Middle East. Caughey has described, in an unpublished report, an epidemic of poliomyelitis which occurred in 1941 among New Zealand troops stationed in Egypt. Subsequently there have been other small localized outbreaks. During the summer of 1943 there were, two of these—in Libya and in Tripoli. We did not have the opportunity of examining these situations first-hand.

## Isolation of Virus from Stools

During the past five or six years methods of testing stools of poliomyelitis patients for virus have been revived by Trask *et al.* (1938) for purposes of diagnosis and epidemiological study. Recent published reports, of which there are many in American medical literature, now record positive isolation experiments in well over 100 cases. Advantages of testing stools rather than nasopharyngeal washings in this disease rest on the fact that in the average juvenile case the virus remains in the intestinal tract (during convalescence) for much longer periods (roughly 20 days) than it does in the nasopharynx.

(roughly 2 to 4 days). Most of the recent work by Trask *et al.* (1938 and 1940), Kramer *et al.* (1939), Howe and Bodian (1940), Kessel *et al.* (1941), and Sabin and Ward (1941a) in the United States; by Kling *et al.* (1939) in Sweden; and by Lépine *et al.* (1939) in France has been done on children, and it has been found to be easier to isolate virus from stools of young children (under 8 years old) than in children over this age. Information with regard to the presence of virus in the stools of adult poliomyelitis patients is far more limited.

Necropsy studies by Sabin and Ward (1941b) and by Kessel *et al.* (1941) in their series of fatal cases (most of which were in the second week of the disease) have also pointed to the intestinal tract as a site of predilection for the virus. They found that in this stage of the disease the virus was distributed predominantly in two systems: (a) certain regions of the nervous system; and (b) the walls of the pharynx and ileum, and the intestinal contents. These may not be the only locations at all times during the disease, but they are the most prominent after serious lesions have become established.

The epidemiological significance of the presence of poliomyelitis virus in the stools of human cases remains unsolved, for as yet the portal or routes of entry of the virus are unknown. Modern research has indicated that the nasal mucosa and olfactory bulbs can no longer be regarded as the main avenues of infection, because human necropsies have failed to reveal in these bulbs characteristic lesions which were shown to be present by Sabin and Ollitsky (1937) when the disease is induced experimentally in the monkey by instillation of virus into the nostrils. Indeed, if analogy existed between the human and the experimental disease, then it would seem that infection through the pharyngeal or gastro-intestinal tract should be seriously considered, because of the relative ease with which chimpanzees and cynomolgous monkeys may be infected by feeding them with virus.

Of further and possible epidemiological significance is the fact that the virus has been isolated from samples of sewage collected by Paul *et al.* (1940) in the United States, and by Kling (1940) in Sweden, during epidemics. Of more interest is the recent discovery of its presence in flies collected at different epidemic centres. This has been noted by Paul *et al.* (1941), by Sabin and Ward (1941c), and by Toomcy *et al.* (1941). Unfortunately, these findings do not indicate how the disease is disseminated, but they reopen the question whether poliomyelitis may not be legitimately placed among the excremental infective diseases pending such times as it may be proved otherwise. In fact, the evidence for other means of infection is appreciable, for poliomyelitis can be reproduced by injecting infective material *subcutaneously* in monkeys, as has also been the case in accidental human infections (Leake, 1935). Consequently, in view of this latter feature, one cannot ignore the possibility of the disease being transmitted by a biting insect. The need for intensive study on the widest possible scale is thus apparent.

#### Clinical Material

Stool specimens from 35 patients (and contacts) were tested; 17 of these were American and 18 British.\* Four different clinical types of case were chosen for study:

- (I) Fifteen typical cases of poliomyelitis were tested in all, of which 10 were fatal.
- (II) Five cases diagnosed *polio-encephalitis*, with a short (3- to 4-day) febrile course and paralysis limited to the cranial nerves. In several the epidemiological background and circumstances in which these cases were contracted were suggestive of poliomyelitis. Positive spinal-fluid findings consisted of pleocytosis varying from 30 to 60 cells (about 60% lymphocytes) and slightly increased protein content.
- (III) Six cases were diagnosed *acute benign lymphocytic meningitis*. Paralysis was not noted except in an occasional case in which there was a transient sixth-nerve lesion. The cell count in the spinal fluid ranged between 20 and 80 cells. In none of these patients did the fever last more than 4 days, and so for this and other reasons we have considered the diagnosis of lymphocytic choriomeningitis to be improbable.†

\* We are indebted in particular to Major C. R. Amies, R.A.M.C., for many of these specimens. Other members of the R.A.M.C. to whom we are indebted for the collection of specimens include Major H. K. Fidler, Lieut.-Col. J. H. Fisher, Major J. E. Caughey, and Major R. S. Illingworth.

(IV) Six cases in which localized *neuritis*, usually involving one or more limbs (generally the upper arms), has often followed a brief period of diarrhoea or fever, or both. A description of the syndrome as seen in New Zealand troops has recently been given by Burnard and Fox (1942). The spinal-fluid findings in our series have usually been normal.

(V) Three poliomyelitis contacts.

#### Laboratory Methods

Stool specimens were as a rule kept refrigerated (or preferably in the frozen state at  $-60$  to  $-70^{\circ}\text{C}$ . in a refrigeration box containing solid  $\text{CO}_2$ ) until ready to be tested. In most instances this period of preserving the sample before its inoculation did not exceed two weeks. Occasionally, when stool specimens were not readily obtainable, enema washings were substituted. In 7 instances colon contents were obtained at necropsy. The usual clinical course of these fatal cases was rapid, and by the second or third day constipation and profound prostration were such that in a large number of instances specimens of faeces could be obtained only at necropsy. In these circumstances a loop of colon was tied off with string, and the loop was excised and placed in the ice-box (for 24 to 36 hours) until the contents could be removed under sterile conditions.

In preparing faecal material for monkey inoculation the following procedure was used:

A 10% suspension in sterile distilled water (using at least 5 or 6 g. of solid or semi-solid stool) was prepared and allowed to settle at room temperature; the supernatant fluid, amounting to about 50 c.c.m., was then divided in half (parts A and B). Part A was kept at ice-box temperature and instilled into the nostrils (in 3-c.c.m. amounts) of a single monkey on three or four successive days; part B was immediately centrifuged for 20 minutes at about 2,000 r.p.m., and to the supernate 15% ether was added as a bactericidal agent. The etherized suspension was kept refrigerated for 48 or 72 hours and inoculated intra-abdominally in amounts of 15 to 20 c.c.m. into the same monkey. This concentration of ether was usually sufficient to destroy or diminish the number of bacteria in the suspension to proportions small enough to permit intra-abdominal injection of 15 or 20 c.c.m. of stool extract without fear of inducing peritonitis.

Daily rectal temperatures and exercise records were taken for a period of four weeks on all monkeys inoculated in this manner. A positive result was based on the following criteria in the inoculated animal:

1. "Clinical."—Signs of the experimental disease—viz., fever, tremor, weakness, paralysis, and prostration, all or some of which may be present in varying degrees.
2. "Pathological."—The presence of characteristic histopathological lesions in the medulla and various levels (cervical, dorsal, and lumbar) of the spinal cord.

With the exception of the experiments by van Rooyen and Morgan, who isolated poliomyelitis virus from the human spinal cord in grivet monkeys and baboons, the types of monkey used in these tests on faecal material have to our knowledge seldom before been employed in poliomyelitis work. Five different species were used: (i) grivet monkeys, *Cercopithecus griseoviridis*; (ii) Central African vervet monkeys, *Cercopithecus aethiops centralis*; (iii) small immature Abyssinian baboons, *Papio hamadryas*; (iv) Hussar monkeys, *Erythrocebus patas*; (v) the bonnet monkey, *Macacus radiata*.

Four of these species (Nos. i-iv), all from East Africa, were shown in these experiments to be susceptible to infection with poliomyelitis virus. Of these we have reason to believe that the baboons are the least susceptible by the various routes of inoculation used. The fifth variety, or bonnet monkey (from India), of which we had only three specimens, was not adequately tested. In the whole series of experiments (including passage experiments) 44 monkeys were used, 6 of the animals twice.

#### Results

A summary of the tests performed appears in Table III. In most instances the results have been listed according to the day of disease on which the stool was collected.

**Poliomyelitis Cases.**—Of the 15 cases tested, the stools (or colon contents) in 9 were positive for poliomyelitis virus.

† Likewise, in precisely similar cases, efforts to demonstrate specific neutralizing antibodies in the blood have all been unsuccessful.



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All of these positive cases proved to be fatal. In one of them the stool was obtained before the patient's death. In one of the 15 cases the result was unsatisfactory owing to the premature death of the monkey. These results suggest that

TABLE III.—Results of Stool Tests for Poliomyelitis Virus

Type of Case	Total Patients	Day of Disease Stool Collected	No. of Patients	No. Positive for Polio Virus	No. Negative	Locomotor Factory Tests
Poliomyelitis	15	3 10 4 18 5 20	9	6	3	0
Polio-encephalitis	1	4 2	1	0	1	0
Poliomyelitis contacts	1	4 2	1	0	1	0
"Benign lymphocytic meningitis"	1	4 2	1	0	1	0
Neuritis	1	4 2	1	0	1	0

\* The experiment was conducted developing poliomyelitis before the period of observation.

the amount of virus present in the intestinal tract was greater in the more severe than in the milder cases of poliomyelitis in this series—a finding which has not to our knowledge received comment before, and one which may not hold true in juvenile cases. Another point, however, in the interpretation of the high percentage of positive results from the faecal samples (which for the most part were fulminating in type) is that most of the "stools" were collected earlier in the disease (on the third to tenth day) than in the other poliomyelitis cases. It has long been recognized that the chances of obtaining positive results are greater during the first than during the later weeks of the disease.

Other Cases (Groups II, III and IV).—All tests for virus in the stools from cases other than typical poliomyelitis proved negative. Several of the monkeys developed fever without symptoms of myelitis and were killed. Histological examination of the spinal cord proved negative, and no doubtful positive results were obtained, but, needless to say, failure to find poliomyelitis virus in such cases does not necessarily exclude the disease.

## Summary

The stool test as a confirmatory means of diagnosis in clinical poliomyelitis has been used in 15 cases of typical poliomyelitis, 17 atypical cases, and 3 contacts, which occurred in British and American troops stationed in the Middle East during 1943.

From the 10 fatal cases of poliomyelitis the isolation of virus from stools was accomplished in 9 instances.

Negative findings have been encountered in the remaining 5 (non-fatal) cases of poliomyelitis (one test was unsatisfactory) and negative results were likewise encountered in 20 "atypical" cases (and contacts)—viz., 5 cases of polio-encephalitis, 6 cases of "acute benign lymphocytic meningitis," 6 cases of neuritis, and 3 poliomyelitis contacts. The negative virus findings do not wholly exclude the possibility of poliomyelitis.

Grivet and vervet monkeys, obtainable in East Africa, are highly susceptible to experimental infection with poliomyelitis virus.

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## REFERENCES

- Burnard, E. D., and Fox, T. G. (1942). *N. Zealand med J.*, 41, 243.  
 Caughey, J. E. (Unpublished data). *J. Infect. Dis.*, 68, 198.  
 Howe, H. A., and Bodian, D. (1940). *Bull. Acad. Méd., Paris*, 123, 335.  
 Kessel, J. F., Moore, F. J., Stimpert, F. D., and Fisk, R. T. (1941). *J. exp. Med.*, 74, 601.  
 Kling, C. (reported by Levaditi, C.) (1940). *Bull. Acad. Méd., Paris*, 123, 335.  
 Olin, G., Magnusson, J. H., and Gard, S. (1939). *Publ. Hlth. Rep. Wash.*, 54, 601.  
 Krammer, D., Gilliam, A. G., and Molner, J. G. (1939). *Bull. Acad. Méd., Paris*, 122, 64.  
 Leake, J. P. (1935). *J. Amer. med. Ass.*, 105, 2152.  
 Lépine, P., Sédallian, P., and Sautter, V. (1939). *Bull. Acad. Méd., Paris*, 122, 141.  
 Levy, A. J. (1937). *Hebrew med. J.*, 2, 258.  
 Paul, J. R., Trask, J. D., Bishop, M. B., Melnick, J. L., and Casey, A. E. (1941). *Science*, 94, 395.  
 Sabin, A. B., and Oltsky, P. K. (1940). *J. exp. Med.*, 71, 765.  
 Sabin, A. B., and Oltsky, P. K. (1941). *J. Amer. med. Ass.*, 108, 21.  
 Sabin, A. B., and Oltsky, P. K. (1941). *J. exp. Med.*, 73, 771.  
 Sabin, A. B., and Oltsky, P. K. (1941). *J. exp. Med.*, 73, 771.  
 Sabin, A. B., and Oltsky, P. K. (1941). *J. exp. Med.*, 73, 771.  
 Schlesinger, R. W., Morgan, I. M., and Fischer, L. A. (1941). *J. exp. Med.*, 71, 751.  
 Toomey, N. A., Takacs, W. S., and Vignec, A. J. (1940). *J. exp. Med.*, 71, 751.  
 Trask, J. D., Paul, J. R., and Gard, S. (1938). *J. Amer. med. Ass.*, 111, 6.  
 Vignec, A. J., and Morgan, A. D. (1943). *Edinb. med. J.*, 50, 705.  
 van Rooyen, C. E., and Morgan, A. D. (1943). *Edinb. med. J.*, 50, 705.  
 Vital Statistics, 1939, Statistical Dept., Ministry of Finance, Kingdom of Egypt (1941). Govt. Press, Bulak.

# SYMPATHECTOMY AND STERILITY

BY  
NORMAN C. LAKE, M.D., MS., D.Sc., F.R.C.S.  
Senior Surgeon, Charing Cross Hospital

A patient upon whom I performed a lumbar sympathectomy some years ago was recently on trial on a charge of "incest." His defence was that as the operation had rendered him sterile it was impossible that he could be the father of his daughter's child. This information he had culled from a surgeon whom he had consulted subsequent to the operation, but before the alleged crime was committed. As removal of part of the lumbar sympathetic chain is now performed with considerable frequency, and in view of possible legal implications, it is time that the question of any resultant sterility should, if our knowledge warrants it, be unequivocally settled.

The physiologists have a good deal to teach us regarding the mechanism of ejaculation and its dependence upon the autonomic supply to the base of the bladder. The course taken by the sympathetic supply is apparently a long one down through the so-called "lumbar splanchnics" and the pre-aortic plexus, coming particularly from the first lumbar contribution. As this part of the sympathetic fibres concerned with ejaculation should escape. But whatever the physiological and anatomical considerations, the practical outcome is whether in fact patients who have submitted to the operation can procreate and whether their semen is, normal.

It has proved more difficult than would be expected to get definite evidence to answer the first question. For reasons unconnected with physical sterility these patients appear very rarely to become parents after the operation. However, I know of two cases in which a child was born subsequent to the operation. The second question is more readily answered. I have examined several specimens of semen obtained from such patients which to my inexperienced eye appeared normal, but a more complete examination of some of the specimens has been carried out by Dr D. Embleton, to whom I should like to express my thanks. Sample results are as follows:

## Examination of Semen after Sympathectomy

- Case 1.—Aged 42; proximal type of thrombo-angiitis obliterans; one year after operation. Volume of seminal fluid, 1.5 c.cm.; pH, 8.0; colour, greyish white; number of spermatozoa, 212 millions per c.cm.; differential count, normal forms 54%, abnormal 46%; hanging drop, about 50% motile.  
 Case 2.—Aged 50; distal type of thrombo-angiitis obliterans; ten years after operation. Volume of seminal fluid, 1.5 c.cm.; colour, greyish white; number of spermatozoa, 162 millions per c.cm.; hanging drop, 83% motile.

This should be sufficient to convince the most sceptical jury in a criminal case.

## Comment

The thoroughness of the sympathectomy (which did not include the first lumbar ganglion) in all cases was, as usual, confirmed by microscopical study of the parts removed, as well as by the subsequent clinical history and sweating tests. This type of sympathetic denervation therefore produces neither sterility nor impotence, and so we can set at rest the minds of those who may hesitate to suggest lumbar sympathectomy, when otherwise advisable, on account of the fear of sterility. It remains a philosophical paradox that a mechanism as characteristically parasympathetic in its functioning as sexual intercourse should require powerful sympathetic activity for its consummation. Possibly the paradox really lies in our conception of an essential opposition in the action of the two systems, an idea encouraged by much physiological teaching.

A comprehensive statistical and epidemiological review of typhoid fever in Egypt from 1935 to 1942 was contributed by Dr. A. M. Kamel and Dr. G. A. Messih to the *Journal of the Egyptian Health Association* for December, 1943. A reprint of this review can be seen in the library of the B.M.A.

## A CASE OF MARCH HAEMOGLOBINURIA

BY

MYER MAKIN, M.B., M.R.C.S.

Captain, R.A.M.C.

March haemoglobinuria is a relatively uncommon condition characterized by the passage of free haemoglobin in the urine after marching or running. The condition was first described by Fleisher in 1881, and since then only 40 cases have been reported in the literature. All these have occurred in non-syphilitic males between the ages of 16 and 35 years. Because it is particularly likely to result from marching or running rather than other forms of exercise it tends to be found in armies more than in the civilian population. It attracted considerable attention in Germany in the last war, but so far very little in this country in the present war. The following case illustrates many of the characteristic features of the condition.

## Case History

Private D., aged 21, medical category A1, an infantryman, reported on March 24, 1943, that for the previous three weeks he had noticed a red discoloration of his urine on exertion. He stated that he had first observed that his urine was "dark brown" five months before, not after exercise but after having stood on guard. About two months previous to reporting sick he had been on some manoeuvres. The first two days were strenuous ones, but he noticed no "dark urine." However, on the third day, which was less strenuous, his urine was dark-coloured at mid-morning. Since then the same urinary abnormality has occurred after marching a few miles after running two to three hundred yards, and sometimes after playing football. He was naturally worried about his condition, but had not had any discomfort, pain, or other untoward symptoms.

There was no history of nephritis, venereal disease, or any other illness except measles in childhood. Both parents and two brothers were alive and well, and there was nothing relevant in their histories. On examination he was seen to be a sturdily built young man. There were no significant physical signs. Posture was normal and without evident lordosis. There was no icterus. The liver was not enlarged and the spleen not palpable. Blood pressure was 110/78.

**Investigation.**—This was carried out in his unit and at Catterick Military Hospital. He was sent out with an orderly on a half-mile run, specimens of urine being collected prior to and ten minutes after exertion. Urine examination revealed:

	Before Exertion	After Exertion
Appearance	Clear yellow	Dark brownish-red
S.G.	1032	1032
Albumin	Nil	Large amount
Sugar	Nil	Nil
Benzidine test	Negative	Very strongly positive
Spectroscope		Oxyhaemoglobin present
Deposit	Few epithelial cells. No red blood cells, pus cells, or casts	Many granular casts. Few epithelial cells. No red blood cells, pus cells, or casts

After a short rest urine examination revealed no abnormality. Blood investigation showed: Erythrocytes, 4,300,000 per c.mm.; leucocytes, 5,500 per c.mm.—polymorphonuclears 61%, lymphocytes 33%, monocytes 4%, eosinophils 2%; haemoglobin, 12.87 g. per 100 c.cm. (83%); C.I., 0.97; film, normal appearance; Donath-Landsteiner reaction, negative; erythrocyte fragility, normal (haemolysis began in 0.44% NaCl and was complete in 0.28% NaCl); W.R., negative.

The patient then had half an hour's strenuous exertion riding a pedal cycle. Urine examination of specimens collected showed:

Specimen	Albumin	Deposit
1 (resting)	Nil	Few epithelial cells.
2 (after 1 hour's cycling)	Trace	No red blood cells,
3 (after 1 hour's rest following 2)	Faint trace	pus cells, or casts
4 (after 2 hours' " " " 3)	Nil	

No blood pigments were present in any of these specimens. Benzidine reactions and spectroscopic examinations were negative.

As there was no evidence of renal damage the soldier was returned to full duty with his unit after hospital investigations. The only precaution taken was full dosage of sodium citrate before exertion in order to alkalize the urine. The haemoglobinuria following exertion gradually decreased until four months after first reporting sick it had disappeared. In September the patient was sent on a mile run, but there was no trace of haemoglobinuria from this

exertion. It is now reasonable to assume that spontaneous recovery has occurred. It is emphasized that, except for a period of two weeks in hospital, the patient has undertaken, without ill effects, all the rigorous duties demanded of an infantryman.

## Discussion

Because the condition may start suddenly without evident reason it is likely to prove alarming not only to the patient but to the medical officer. But the close association with certain forms of exercise and with nothing else should as a rule be sufficient to enable the diagnosis to be made. The finding of granular casts in the urinary deposit may lead to a misdiagnosis of nephritis, but these also are present only during the actual periods of haemoglobinuria, and are not indicative of renal damage. The dark brownish-red urine may be mistaken for haematuria and lead to extensive investigation of the renal tract for calculi, etc.; but in haematuria the centrifuged urine becomes clear, all red cells being carried down in the deposit, whereas in haemoglobinuria the pigment cannot be removed by centrifuging. Two other forms of haemoglobinuria are occasionally encountered. Paroxysmal haemoglobinuria may occur in syphilitics on exposure to cold. In this condition the Wassermann reaction is usually positive, and it is characterized by a positive Donath-Landsteiner reaction. In the other—nocturnal haemoglobinuria—the haemoglobinuria occurs characteristically at night and may be so severe as to cause a gross anaemia. In the great majority of cases it is possible to differentiate between these three forms of haemoglobinuria by careful attention to the history of the case.

March haemoglobinuria is usually caused by exercise taken in the upright position. It tends, like orthostatic albuminuria, to be associated with the lordotic posture, and sufferers may show no haemoglobinuria if made to undergo equally strenuous exercise in the kyphotic position. Gilligan and Blumgart (1941) were able to demonstrate this, and it was shown in the present case. It was noted also by Fisher and Bernstein (1940) that a marathon runner who developed this condition tended to assume an unusually lordotic position when running. In a case reported by Witts (1936), however, the haemoglobinuria could be evoked by exercise on a bicycle ergometer, and in the present case there was no evident abnormal degree of lordosis.

In spite of its alarming symptoms, march haemoglobinuria is a benign condition. It is unlikely to lead to serious anaemia; it does not seem to damage the kidneys; and it nearly always clears up spontaneously in a few months or at most a year or two. It is not due to syphilis, and its cause remains unknown.

## Summary

A case of march haemoglobinuria is reported.

The haemoglobinuria occurred only after exercise in the erect position.

The patient had no other symptoms and there was no interference with his efficiency as an infantryman.

Spontaneous recovery occurred.

I wish to thank Lieut.-Col. C. L. Cope, R.A.M.C., Officer i/c Medical Division, Catterick Military Hospital, for undertaking the hospital investigations and for his kind assistance in the preparation of the case report. I also wish to thank Col. J. C. McGrath, M.C. A.D.M.S., for permission to publish.

## REFERENCES

- Fisher, A. M., and Bernstein, A. (1940). *Johns Hopk. Hosp. Bull.*, 67, 457.  
Gilligan, D. R., and Blumgart, H. L. (1941). *Medicine*, 20, 341.  
Witts, L. J. (1936). *Lancet*, 2, 117.

At the annual meeting of the Medical Insurance Agency held on May 31, with Sir Robert Hutchison, Bt., in the chair, Sir Kaye Le Fleming and Dr. Geoffrey Evans were elected to the committee of management for three years. Dr. J. W. Bone, Dame Barri Lambert, and Dr. Henry Robinson were re-elected for a like period. Distributions to the medical charities were authorized, mostly under seven-year covenants, by which they will benefit in the following amounts: Royal Medical Benevolent Fund, £2,958 12s. 4d.; Epsom College (including £50 for Sherman Bigg Fund), £889 13s. 2d.; Squire Sprigge Scholarship Fund, £58 7s. 2d. The report of the committee of management showed that, in spite of the steady diminution of motor insurance and of new life business, the net profit is still slightly above the pre-war average. Sir Robert Hutchison was re-elected chairman, and the proceedings were concluded with a vote of thanks, to him for services during the past year.

## Medical Memoranda

### Severe Tetanus with Recovery

The following case is of interest as an example of the efficacy of large doses of antitoxin given early in the treatment of tetanus, and emphasizes the need for wider knowledge of this method of combating the disease.

#### CASE HISTORY

A nursery foreman aged 65 lacerated the little finger of his right hand; he received no antitetanus serum, and the injury was treated at home with an ointment. Eight days after the accident he noticed stiffness of his jaw, and the next day this was followed by stiffness and pain in his back and neck. On the morning of the third day after the onset of symptoms he received 1,000 units of antitetanus serum intramuscularly and was sent to hospital.

On admission all the physical signs of tetanus were present except spasms. He received 30,000 units of A.T.S. intravenously soon after arrival, and three hours later 50,000 units by the same route and 40,000 units intramuscularly, followed by 60,000 units intramuscularly the next morning; the total dosage was thus 211,000 units in 24 hours. He was given 40 gr. of chloral hydrate by mouth; and his finger was dressed with hydrogen peroxide at frequent intervals. The following day he was opisthotonic, perspiration was profuse, and several spasms occurred mainly involving the muscles of the back. He was given 6 drachms of paraldehyde in oil per rectum. For the next 18 days he had 3.4 g. (0.06 g. per kilo) of tribromethyl alcohol (avertin) per rectum night and morning, making a total of 118 g. He was sufficiently conscious before each administration to allow oral feeding, and deglutition was at all times possible. He received about 2,000 calories a day. Although his fluid intake was 60 fl. oz. and his urine output 30 fl. oz. a day he was becoming dehydrated by sweating, and on the seventh day of the disease he was given intravenously 2 pints of 5% dextrose in normal saline. From the eighth day onwards he improved daily, and on the thirteenth day he could open his mouth more readily. Avertin was discontinued on the twenty-first day; he had three doses of 30 gr. of chloral hydrate on the next two days, after which sedation was discontinued. He got up for the first time one month after admission and was discharged a week later. His temperature rose to 99.4° F. on the twentieth and twenty-first days of the disease, but was otherwise normal.

#### COMMENT

The successful recovery of this case in spite of the onset of the disease eight days after injury, the onset of spasms only four days later, and the age of the patient, serve to emphasize the effectiveness of early administration of massive doses of antitoxin in the treatment of tetanus, and also to show that intrathecal injection and further administration are unnecessary. Too much stress cannot be laid on the importance of adequate sedation and at the same time the maintenance of sufficient nutrition and fluid intake.

PETER H. SCHURR, M.B., B.Chir.,  
Resident Surgical Officer.

Worthing Hospital

### Seven-year Cure in a Case of Carcinoma of the Bronchus

Apart from those cases in which early recognition may in suitable conditions render lobectomy with removal of the growth possible, the prognosis is hopeless whatever method of treatment is adopted, and a cure is rare. The following case is of interest in that non-radical treatment has produced a complete cure for the last 7 years.

#### CASE HISTORY

The patient, aged 53, a carver and gilder, was admitted to the Middlesex Hospital for the first time on March 19, 1937, complaining of a heavy feeling in the chest, with dyspnoea, for the previous 4 weeks; burning pain in the right scapula on coughing, for the last 7 days; long-standing harsh dry winter cough, worse recently, with scanty non-offensive sputum. He had lost 2 stone, and weighed 8 st. 12 lb. There were occasional palpitations, no haemoptyses or sweats, and no anorexia.

Clinical examination revealed poor nutrition, with septic teeth, but normal mucosae. No clubbing of fingers, cyanosis, oedema, or glandular enlargement could be demonstrated. Pulse, 100 regular; respirations, 20-26; B.P. 130/80. No enlarged veins were seen, and the trachea was central. Most physical signs were found over the right chest: diminished excursion; impaired percussion note at lower and mid-zones posteriorly and laterally, with absent breath sounds; weak breath sounds, bronchial in character, and crepitations towards the apex. Compensatory harsh vesicular breathing was present over the left chest. No abnormality was detected in the heart or C.N.S.

Investigations and Treatment.—Screening and x rays showed normal movement of the diaphragm, also an opacity in the right mid-zone which was posterior in position: coelocclusions? early collapse. Lipiodol was found not to enter that area. The Wassermann reaction was negative. Bronchoscopy was performed by Mr. C. P. Wilson on April 6, 1937. A growth was found obstructing the dorsal division of the right lower lobe bronchus, and a portion was removed for microscopy. This showed infiltration of

tissue by squamous-cell carcinoma. Ten days later bronchoscopy was repeated as before, and 9 × 1.6 mc. of radon in short Muir seeds were inserted round the site of the growth. The patient was apyrexial throughout. The erythrocyte sedimentation rate on admission was 6.6 mm./hour; one week before bronchoscopy it was 7.8 mm./hour, the day after bronchoscopy 8.2 mm./hour, and one week later 7.6 mm./hour. Convalescence was uneventful and he was discharged one month after admission. No post-operative irradiation was given.

A regular follow-up was maintained. Three months after discharge his weight was 9 st. 1 lb.; he was feeling much better and had only a slight cough. The pain had entirely disappeared, as had the dyspnoea. Radiographs showed the radon seeds still *in situ*. Since that time he has had frequent x-ray examination at 3 to 6 months' intervals. The previous opacity in the lung field disappeared, and no further change occurred in his physical state.

Readmission.—The patient was readmitted on Nov. 22, 1943, with gradually increasing symptoms of seven weeks' duration: cough and colourless sputum; moderate dyspnoea; pain in right chest radiating to the back. His weight was now 8 st. 7 lb. On examination there was weaker air entry, with a few rales on the right side, together with harsh vesicular breath sounds on the opposite side. Nothing else relevant was observed. Radiographs of the chest showed no evidence of lung collapse. Three seeds were still present in the main bronchus and one lower down. Hb. 102%; W.B.C. 5,700; E.S.R., 25 mm./hour Westergren. Sputum: No malignant or tubercle bacilli seen; numerous organisms were present, the pneumococcus being predominant. Bronchoscopy was performed by Dr. J. E. G. Pearson under local cocaine anaesthesia and pentothal. Slight general constriction of the right lower lobe bronchus was found at the level of the middle-lobe opening. The area surrounding the dorsal lobe appeared somewhat pale—? fibrotic; the lumen of this branch seemed grossly constricted, and had been presumably the seat of the neoplasm as indicated by the original notes and diagrams. A portion of this area was taken, and microscopy revealed only respiratory epithelium, mucous glands, smooth muscle, fibrous tissue, and cartilage; no evidence of growth. The patient improved greatly with conservative treatment. He was discharged 34 weeks after admission, and is now back at work in an aircraft factory.

#### COMMENT

The effects of treatment of carcinoma of the lung were recently estimated by the Clinical Cancer Research Committee (British Empire Cancer Campaign Annual Report, 1943), who showed that radium application, although used in fewer cases, appeared to yield better results than x-ray treatment, the expectation of life being increased by 13 to 22% as against 6% in the latter.

I am most grateful to Dr. C. E. Lakin, Mr. C. P. Wilson, and Dr. J. E. G. Pearson for their permission to publish this case.

DAVID A. FERMONT, M.R.C.S.,  
House-physician, Mount Vernon Hospital, Middlesex.

### Post-mortem Appearances of Malignant Tertian Parasites

In the description of a fatal cerebral case of malignant tertian malaria given in the *Journal* (1943, 2, 814) difficulty was encountered in finding malaria parasites in sections of brain and spleen. Although textbooks stress the importance of making films at the time of post-mortem examination in order to detect parasites in the viscera, the following short account of the actual appearance of films from brain and spleen in such a case may be of use:

**Films from Brain.**—Thin smears from cerebral cortex are made in the post-mortem room. These are fixed and stained by Leishman's method. Chains of parasites are seen occluding the cerebral capillaries. The parasites stain blue, and each contains a dark mass of pigment. The course of the cerebral capillaries is in fact made strikingly clear by these characteristic chains of pigment-containing parasites. The red cells in which the parasites are contained are not readily distinguishable, however. Most of the parasites appear to be schizonts, and differential nuclear staining and division into merozoites can be seen in the thinner parts of the film.

**Films from Spleen.**—In spleen smears, similarly prepared and stained, the minute structure of the enormous number of sporulating schizonts is readily distinguished. Only some of the parasites, however, can definitely be located within red blood cells. The cytoplasm of the parasites is stained slaty blue, and the chromatin of the nuclei gives a beautiful metachromatic violet-red reaction. All stages in schizogony are encountered from early nuclear division to final liberation and separation of the individual merozoites, which can be seen migrating freely in the splenic pulp. Many of the merozoites are in "rosette" arrangement, grouped in the merozoite, and each merozoite is clearly seen to contain a violet-red chromatin particle and a slaty-blue cytoplasmic mass. The pigment of each merozoite is generally prominent as a brown-black concretion, often centrally situated. As many as 20 merozoites can easily be counted as emanating from some of the merozoites.

The above description illustrates the appearance of parasites of *Plasmodium falciparum*, which may readily be observed in films from spleen and brain within half an hour of completing post-mortem examination on a fatal pernicious cerebral case. The advantage of making films over sections in such cases is thus evident.

K. C. DIXON, Ph.D., M.B.,  
M.Sc., R.N.C.

## Reviews

### MENTAL HEALTH IN OLD AGE

*New Goals for Old Age.* Edited by George Lawton. (Pp. 210. 22s.) New York: Columbia University Press; London: Oxford University Press. 1943.

"Everybody wants to live long," said Talleyrand, "but nobody wants to be old." Recently it has been forced upon public attention that the proportion of the old to the young is rapidly increasing, a change which creates problems of its own. On the whole, the medical profession have not been greatly interested in these, despite the writings of Sir George Humphry and Sir Humphry Rolleston on the subject. A non-medical book by Cowper Powys entitled *The Art of Growing Old* is a notable illustration of how not to do it. The book before us, which is of more serious import, is a collection of lectures delivered by different authorities in a course on "Mental Health in Old Age" in New York, and suffers somewhat from the lack of unity inherent in this method. Yet the result is helpful if rather diffuse. Emphasis is rightly laid on the importance of thinking during middle life of what later life may have in store and of making adaptations accordingly. To pass from full occupation on a fixed date to complete inactivity is fraught with danger, as Elia found, "thinking I was happy, and knowing I was not. I was in the condition of a prisoner in the old Bastille suddenly let loose . . . I missed my old chains." As the editor of this volume puts it, "It is fear of ageing rather than the ageing process itself which often causes a fundamental loss in the mental realm, just as it does in the physical. Anticipating the loss of efficiency, we hasten the arrival of what we expect." The acceleration in the rate of social change imposes a strain on the old, for it renders the private worlds they have built up years ago increasingly incompatible with the external one. How the individual handled life in the past is the best clue to whether he is equipped to face the problems of advancing age. In a curious way the temperamental make-up of childhood, whether conducive to happiness or unhappiness, may reappear. It is well known that senescence has no fixed date, and heredity is undoubtedly the most important factor. Interesting instances are related here of identical twins, living under different conditions, ageing in precisely the same way at the same time. The date of senescence therefore appears to be inherent in the germ plasm.

"In the years to come we shall have to develop a whole repertory of ways to utilize the judgment and experience of older people, whether these be in an advisory or teaching capacity," for "the older individual retains almost unimpaired his capacity for solving mental problems of equal difficulty to those he could solve when younger." Though originality will decline, discrimination may increase. The field of interest is apt to contract, and the most subtle temptation for the old person is to excuse himself for yielding to such contraction on the score of age. For those unable to find interesting occupation for themselves schemes of occupational therapy are described which are in actual operation. An important section of the book is devoted to the subject of institutional homes of various grades, where some sort of community life can be enjoyed. Such are already in existence in this country also, as organized by Mrs. A. V. Hill and others, but the future will call for far more. In short, as the writers maintain, old age must be made to feel that it still has usefulness if it is to be "frosty yet kindly."

### CONDITIONS OF MEDICAL WORK

*An Industry of Health. Being an Exposition of Assumption B.* By T. B. Layton. M.S., F.R.C.S. (Pp. 96. 3s. 6d.) London: William Heinemann. 1944.

The advertisement on the back of this book says that it is intended to "give the layman a background which will assist him to understand, assess, and criticize the proposals so that his views may be heard and his needs fully considered and met." Mr. T. B. Layton approaches his subject, which has a direct bearing on the White Paper proposals, in a novel way by drawing an analogy between medicine and ordinary industry.

The latter has evolved from the solitary handicraftsman to the organized factory, and medicine is following the same course. Domiciliary treatment has lagged behind, and Mr. Layton says it can "no longer remain in the primitive condition where the individual does everything." The team work characteristic of a good hospital must be provided for, and the key position of the doctor giving domiciliary treatment is fully recognized.

He divides the doctors into clinicians and others, and these others into two classes: "one which produces the evidence for the clinician which he is unable to obtain himself with his six senses," and the other the laboratory worker and the administrator. Some acute comments are made on the place of the administrator which are relevant to the discussion of the White Paper. Mr. Layton insists that no clinical interference from the administrator should be allowed, and he thinks that "a want of clear distinction between clinical interference and clinical administration is the chief cause of the alarm that at present exists in the profession."

The chapters deal with every branch of medicine, including the various sections of the medical profession, ranging from the pharmacist, nurse, and dentist, to the almoner and receptionist. Of the nurse, he thinks that "for the rank and file of the nursing profession we should not ask for any standard of general education higher than that at which we aim for all. Girls from humbler homes make better nurses than those from the well-to-do. They have had experience in these fundamentals since infancy." He gives two chapters to the discussion of health centres, in which he strongly supports the need for experimentation. He believes there is room for both the State and the voluntary hospital. In the State hospitals the chief defects, he thinks, arise from the methods of control, on which subject he is very critical.

It is to be hoped that the book will be widely read, not only by the laymen for whom it is primarily intended, but also by those members of the profession who are anxious to consider every point of view in this important discussion, whether it comes from the idealist or from those who know by experience what they are talking about—as Mr. Layton does. He has had a long experience in both kinds of hospitals, and has taken an active part in National Health Insurance administrative work.

### YEARBOOK OF SURGERY

*The 1943 Year Book of General Surgery.* Edited by Ewart A. Graham. M.D. (Pp. 736; illustrated. \$6.00 or 19s.) Chicago: The Year Book Publishers, Inc.; London: H. K. Lewis.

The distinguished editor of this book comments on the retardation that war inflicts upon scientific progress, and suggests that the volume for 1943 may appear to be less rich in new ideas than previous ones. This is questionable, however, for this year's survey strikes us as containing much that is new and important, and we must not lose sight of the fact that, while no doubt much is lost to surgical progress by war, much is also gained, particularly in the field of traumatic surgery. Wars have brought about advances in wound treatment from Ambrose Paré's time onwards, and we might remark that the sulphonamides and penicillin have quickly come into their own in the present carnage. It is conceivable that in times of peace their general adoption might have been a much slower process. We should have liked to see more about penicillin in the present volume—there is only one brief reference to it as a prophylactic against gas gangrene. No doubt next year's survey will remedy this defect, however, and give us a comprehensive account of the results of its employment in the treatment of wounds and infections generally. With the exception of urology, gynaecology, and some parts of orthopaedics, recent contributions to all branches of surgery are reviewed. There are in this issue, perhaps, fewer of those small-print, pithy, and pleasing editorial comments than usual, but last year's innovation of what is called a "surgical practice quiz" is continued on the dust cover; it is a series of questions relating to recent developments, the answers to which are to be found in the text.

This is an important publication, to the appearance of which we always look forward. There are some excellent papers reviewed in the present issue which no busy surgeon can afford to neglect.

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# 'ROCHE' News in Brief

## Prevention of Muscular Fatigue

A report refers to 223 persons who were divided into two groups. The first group of 25 subjects was put on large doses of ascorbic acid ('Redoxon'), viz., 150-350 mg. daily, for several days before engaging in strenuous physical exertion such as riding, mountaineering, heavy work in gardens or fields. Only one person complained of muscular fatigue (4%). Of the controls, 198 subjects, undergoing the same exertions, 162 experienced severe muscular pain (80.8%). To protect against muscular fatigue amounts far above the anti-scorbutic doses are required. (*Rev. Med. Suisse Rom.*, 1943, No. 8, p. 640.)

## Ocular Signs of Riboflavin Deficiency

In a recent paper (*Lancet*, 1944, 1, 431) it was pointed out that a group of cases exhibited corneal vascularisation of a particular recognisable type which rapidly diminishes when riboflavin is given in sufficient doses. This condition was found in 7.8 per cent. of 422 persons. The effect of riboflavin was studied in 13 cases for an adequate period, and it was found that it produced cessation of the abnormal corneal circulation. Small doses of riboflavin (3 mg. daily) caused only slow improvement, but 10 mg. daily led to much more rapid diminution, usually complete in 3-4 weeks.

## Stomatitis due to Riboflavin Deficiency

In a camp in North Africa containing 10,313 men of many races, nearly 17 per cent. was observed to have stomatitis. On a diet containing an average of 1.61 mg. riboflavin per day the camp population had been free from stomatitis. It developed about two months after the daily riboflavin intake was reduced to about 1 mg. per head, and it was not abolished by the intake of 1.28 mg. in the following month. The stomatitis yielded rapidly to treatment either with riboflavin (100 mg. in five days) or fresh yeast (½ oz. daily). The lesions on the tongue were studied with a slit lamp. So far as the authors of the paper know this has not been done before, and they add that the method is useful and might be exploited further. (*Lancet*, 1944, 1, 720.)

## 'Prostigmin' in Glaucoma

Thirty-one patients suffering from glaucoma were treated with 'Prostigmin' with good results, the drug producing the desired fall in intraocular pressure. In the majority of cases a 3 per cent. solution was given; in rare cases 5 per cent. was given when there was a great increase of tension. In certain cases the concentration was reduced to 1 per cent. after the tension had been brought to normal with a 3 per cent. solution. (*Ophthalmologica*, 1942, 104, No. 1.)

A special 3 per cent. solution is now available for the treatment of glaucoma. The retail price in the United Kingdom of this preparation is 10s. per 7.5 c.c. in dropper bottles.

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## X-RAY DIAGNOSIS OF JOINT DISEASE

*The Arthropathies. A Handbook of Roentgen Diagnosis.* By Alfred A. de Lorimer, M.A., M.D. (Pp. 319; illustrated, 35.50.) Chicago. The Year Book Publishers, Inc.; London: H K Lewis

This is one of a series of six handbooks dealing with the various branches of x-ray diagnosis. The foreword stresses the importance of the radiographer being given the opportunity of studying the clinical and laboratory data in order to arrive at a correct interpretation of the x-ray findings, and if this were the universal practice it would add greatly to their value. Following out this practice the author has described the pathological appearances at different stages of the various pathological conditions dealt with, and follows this with an account of the age and sex incidence, the history, physical and laboratory findings, and the clinical course. By this means he furnishes a picture of the disease, concise and yet complete to a remarkable degree, which cannot fail to be of great value not only to the student of roentgenology but also to the general practitioner. Every conceivable disease of the joints appears to have been dealt with in a thorough manner, and illustrated lavishly, as may be judged from the fact that the number of figures—mainly reproductions of radiographs but with some anatomical diagrams—amounts to 678. The importance of studying the appearance of the soft tissues as well as the bony structures receives prominence, and a very useful feature is the separation of the likely changes from those which may only possibly be present.

The illustrations are on the whole good and clear, the matter is compactly arranged, and supplies a mass of information in a remarkably small space and at a very reasonable cost. The book is one that can be strongly recommended to all who are concerned with the diagnosis of bone and joint diseases, and will be found a most useful addition to the library of the general practitioner.

## Notes on Books

As the editors of the new edition of *Textbook of Medical Treatment* (E. and S. Livingstone; 30s.) truly remark, it is a striking commentary on the rapidity of advance in medical therapeutics that the publication of its third edition only two years after the second should involve extensive changes in the text. The difficulty of keeping such works up to date and the inevitable delays in publication are illustrated by the absence of penicillin from the index. Among the sections that have been completely or partly rewritten are those on cerebrospinal fever, sprue, haemorrhagic and haemolytic diseases, blood transfusion, diabetes insipidus (where pitressin tannate has proved a real advance), parathyroid tetany (where vitamin D or dihydrotachysterol has been shown to be so superior to parathormone therapy that it might well be abandoned), and essential hypertension, of which it is justly said that its complications are more devastating than those of malignant disease. As might be expected, considerable emphasis is laid on peptic ulcer, now so prevalent, and on tuberculosis, now on the increase. The invasion of the surgeon into the chest continues with benefit. There is evidence throughout of careful revision, and we can cordially repeat the welcome we extended to the earlier editions. Particularly do we appreciate the explicitness of the directions given and the avoidance of vague and ambiguous statements, which greatly enhance the value of this excellent work.

*The Year Book of General Therapeutics, 1943* (Year Book Publishers of Chicago and H. K. Lewis; 19s.) aims at collecting in one handy volume information on diagnosis and treatment published during the year. The editor is to be congratulated on the result, for the book is readable and informative despite the wide range of subjects. The matter is essentially a series of abstracts, but as those relating to one subject are collected together, and are written with much fuller explanation than abstracts usually are, they provide an interesting text. There is a long chapter on the sulphonamides, and another, on penicillin. Matters dealt with prominently are the treatment of burns, malaria and syphilis, blood transfusion, blood diseases, hormones and vitamins. The book offers a solution to the doctor's problem of keeping up with new work, and, provided that as years go by it retains its present convenient size, it is likely to have a steadily expanding sale.

Mr. H. J. B. ATKINS's book *After-Treatment*, a guide to general practitioners, house officers, ward sisters, and dressers in the care of patients after operations, was favourably noticed in these columns on July 25, 1942. A second edition has now appeared (Oxford: Blackwell Scientific Publications; 18s.). There are two new chapters, one on post-operative treatment of children and another on rehabilitation. There are also new sections on post-operative coronary

thrombosis and on the management of the diabetic patient in the post-operative period. The section on head injuries has been brought up to date and now incorporates much of the teaching of the Oxford school. The book in its revised form should be very welcome at the present time.

## Preparations and Appliances

## AN IMPROVED SACCHAROMETER

Dr. J. E. STANLEY LEE, F.R.F.P.S., F.R.C.S.Ed., medical superintendent, New Cross Hospital, Wolverhampton, writes:

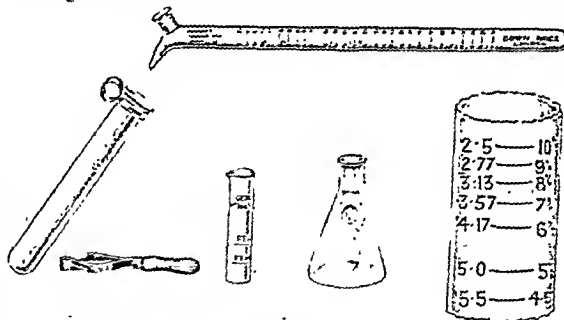
An apparatus for the rapid estimation of sugar in urine by Fehling's method using a modified Bink's burette was described by Carwardine,<sup>1</sup> but the graduations showing the amounts of urine and water to be added are not clearly indicated, with the result that inaccurate findings are obtained and the use of Fehling's method makes it extremely difficult to ascertain the exact end-point.

In order to overcome these difficulties, an improved model has been devised and adapted for use with Gerrard's cyanocupric method, which depends upon the fact that the colourless double cyanide of potash and copper is capable of holding cuprous oxide in solution. If, therefore, Fehling's solution is titrated with a sugar solution in the presence of this cyanide, the blue colour fades gradually, no precipitate being thrown down. The colourless end-point is thus very sharp, and, as there is no tendency to re-oxidation, the process may be safely conducted in an open flask.

The saccharometer tube, which has a double scale (c.c.m. on the left and sugar percentages on the right), is so graduated that the urine is diluted to 1 in 10; the formula being:

$$\frac{\text{c.c.m. diluted urine used}}{25} = \frac{1}{10} \text{ sugar in specimen.}$$

No cork is necessary with the present apparatus because the lumen of the nozzle has been adjusted to a convenient size, and an Erlenmeyer flask with a long holder has been chosen with a view to reducing the risk of accidents due to escape of the boiling solution.



## Directions

1. Fill measure to mark "GW" with Fehling-Gerrard's solution (Fehling's solution 1 part, Gerrard's solution 3 parts).
2. Pour into flask (or large test-tube).
3. Fill burette to "U" with urine, dilute by adding water to "DU," place finger over opening and mix well by inverting the burette.

## Estimation

1. Boil flask (or large test-tube), add, whilst boiling gently, add diluted urine from the burette until the blue colour is discharged.
  2. Hold burette vertically and read off percentage of sugar.
- When the quantity of sugar in the urine is very small, the burette can be filled with undiluted urine to the mark "DU," when the percentage obtained should be divided by 10.

A mixture of Fehling's solution 1 part and double cyanide 3 parts will keep for a number of weeks<sup>2</sup> and can be obtained from British Drug Houses, Ltd. Provision has also been made for estimation by Fehling's method, the measure being graduated for Fehling's solution Nos. 1 and 2, and for dilution to mark "GW" by water instead of Gerrard's solution.

I wish to thank Messrs. Down Bros., Ltd., who have made the apparatus for me and also provided the necessary electro for the illustration, and Mr. A. W. Farmer, laboratory technician, New Cross Hospital, Wolverhampton, for his technical assistance.

<sup>1</sup> *Lancet*, 1894, 2, 1165.

<sup>2</sup> Hutchison and Hunter, *Clinical Methods*, 9th edition, p. 371, Cassell, 1932.

# BRITISH MEDICAL JOURNAL

LONDON

SATURDAY JUNE 24 1944

## ARTIFICIAL RESPIRATION

Though artificial respiration is a universally employed treatment that often proves life-saving, its investigation has been somewhat neglected in the past; but interest in the subject has been renewed in recent years, as exemplified by the important work of Hemingway and Neil reported in our opening pages this week. Yandall Henderson used to say that in America many laymen, such as ambulance personnel, members of the police force, and workers in high-tension plants, were often better trained to carry out artificial respiration than were some doctors; in fact, in one great American city the public were advised when faced with a case of asphyxia to ring up the fire brigade first and the doctor second. Without accepting Henderson's criticisms of our American colleagues we can say that British doctors nowadays are fully alive to the importance of being thoroughly familiar with artificial-respiration technique. But there still remains much doubt as to which is the best method to employ, and, in fact, there is uncertainty about the criteria by which any method of artificial respiration should be judged.

A sharp distinction must be drawn between the problems involved in treating a case of gradually progressive respiratory paralysis (like that complicating anterior poliomyelitis) and those of acute respiratory failure due, for example, to drowning, inhalation of irrespirable or poisonous gases, suicidal and accidental overdoses of narcotics, and electrocution. In the chronic group there is usually ample time to use a breathing-machine. In the acute group not a moment may be lost, and the treatment must be capable of being carried out by the first instructed person on the scene and require the use of no more equipment than can be readily improvised almost anywhere. There is another fundamental difference—which is often overlooked—between the chronic and acute forms of respiratory failure. In the former machine-breathing is instituted while the circulation is functioning normally; if the mechanical respiration is efficient no circulatory derangement develops and the blood-flow to all the organs remains normal. In acute asphyxia, on the other hand, failure of the circulation and of the central nervous system follows rapidly in the train of respiratory arrest. The body is unfortunately quite unadapted for dealing with complete or even very severe oxygen lack. Food starvation can be withstood for weeks and water deprivation for a few days; but grave anoxia "stops the machine and wrecks the machinery" (to use J. S. Haldane's unforgettable phrase) in a matter of minutes. Let us consider the sequence of events in drowning, for example. After one minute or so of complete lack of oxygen consciousness is lost; within another minute or two the respiratory centre, which initially was stimulated, ceases to function. The

vasomotor centre is more resistant and may maintain vasoconstriction for a little longer, but soon it too fails, and full peripheral vasodilatation sets in, with a resulting fall of blood pressure to about 40 mm. Hg. Most important of all, we must always remember that the heart—unlike skeletal or smooth muscle—can function normally for only a short time in the absence of oxygen; it has no type of anaerobic metabolism to fall back on. The force of the heart-beat in severe anoxia rapidly weakens and the chambers greatly dilate; the output into the blood vessels is reduced to a trickle, and the blood-flow to the organs almost ceases. When fibrillation of the ventricles develops the chances of recovery are of the slenderest. Acute asphyxia thus presents a combination of respiratory, circulatory, and nervous-system failure with which the treatment employed must cope effectively if it is to succeed.

There is no disagreement as to the immediate action which should be taken. As Hemingway and Neil emphasize, "the Schäfer method should be immediately instituted when resuscitation is undertaken," and "no time should be lost while preparations are being made for the use of any other method." Incidentally, it should be made clear to laymen that in the Schäfer method pressure is not applied over the lower part of the chest but over the lumbar region; compression of the abdomen so brought about drives its contents on to the diaphragm, which diminishes the size of the thoracic cavity and causes expulsion of air from the lungs. The active phase is thus expiration. When pressure on the loins is released the diaphragm descends once more and air is drawn into the chest. In normal subjects who have voluntarily suspended their respiration it is easy to demonstrate that Schäfer's method produces an adequate pulmonary ventilation; but it has been argued that some degree of active co-operation is being supplied by the conscious subject. To avoid this complication experiments have been performed during the apnoea which follows a bout of vigorous over-ventilation. Under these conditions a disappointing degree of lung ventilation is obtained, which is said to contrast poorly with that yielded by the Silvester method. But in over-ventilation apnoea there may be a good deal of muscular rigidity which constitutes a mechanical hindrance. Ideally to test artificial-respiration methods, observations should be made on the fresh, warm, non-rigid cadaver or on cases of respiratory failure from overdosage with anaesthetics or narcotics; but as yet data from such sources are very scanty. It has been argued theoretically against the Schäfer method that in unconscious subjects muscle tone is lost, that consequently the diaphragm will not recoil (as normally) into the abdomen when pressure is removed from the loins, and that effective inspiration will therefore not be produced.

The chief competitor of the Schäfer method in this country is the rocking method introduced and persuasively advocated by F. C. Eve. It only requires some kind of stretcher and fulcrum; it is easily and conveniently carried out aboard ship. The principle of the method is straightforward enough. When the head is tilted down the abdominal viscera fall on to the diaphragm and compress the contents of the chest, producing expiration; with the feet down the viscera pull the diaphragm back into the

abdomen; the thoracic cavity is enlarged, and inspiration results. It is claimed that even the toneless diaphragm responds adequately to these mechanical forces. Hemmingsway and Neil have compared the efficiency of the Schäfer and rocking methods in dogs in which respiration was abolished by deep anaesthesia or section of the upper cervical spinal cord: in both groups muscle tone, including that of the diaphragm, was practically absent (as is the case in asphyxiated human subjects). The volume of the tidal air was found to be generally smaller with the Schäfer method, the mean advantage in favour of the rocking method being 50% and most pronounced when the loss of muscle tone was most complete. These results lend substance to the criticism of the Schäfer method already referred to.

But it must be remembered that resuscitation demands more than just effective pulmonary ventilation: the oxygen introduced into the lungs must be transported by the circulation, especially to the brain, heart, and kidneys. As only a minimal circulation is present in asphyxiated patients, and life is being maintained most precariously, quite small differences in the circulatory state produced by the resuscitation technique may be of decisive importance. Hemmingsway and Neil have shown clearly that even with equal degrees of pulmonary ventilation the rocking method is associated with a greater cardiac output and therefore with a better blood-flow to the organs, and with a higher level of oxygen consumption. These important advantages of the rocking method are largely due to obvious mechanical factors. In the head-down phase the venous blood drains out of the legs and abdomen into the heart, and the arterial blood-flow into the head is facilitated. During the feet-down position venous blood drains out of the head, and the lower part of the body is fed with arterial blood, though the venous outflow from that region is impeded. Some of these advantages are lacking in the Schäfer method. A good case has been made out experimentally for changing over from the Schäfer to the rocking method as soon as suitable facilities are available. It seems that an angle of rock of 45° is adequate; employing a rate of 8 to 9 rocks per minute, the 7-second cycle might be divided into 4 seconds head down and 3 seconds feet down to obtain the full circulatory benefits of the head-down position. It is to be hoped that the circulatory changes during resuscitation in man will receive more careful consideration in the future.

### THE WAY OF THE INVESTIGATOR

"Every physiologist who is more than a technician is something of a philosopher because he is constantly dealing with the problem of life, and sooner or later he will feel the urge to step out of the laboratory and to look at the field as a whole." In these words Dr. H. E. Sigerist introduces his translation of Maurice Arthus's essay on *The Philosophy of Scientific Investigation*.<sup>1</sup> Early in life Prof. Arthus fell under the spell of

Claude Bernard's methods and applied them faithfully. Bernard, when he reached some conclusion, criticized it with the firm determination to demolish it if possible. When in spite of all efforts he did not succeed in pulling it down, then and only then did he accept it as valid and publish it. This rigorous method if generally followed would probably diminish the output of scientific literature considerably. Arthus became known in this country in the last decade of the nineteenth century for his work on the coagulation of blood, but his main work was on anaphylaxis. He would stress to his students that though a fact is always interesting it only acquires significance if properly interpreted, just as a work of art acquires its complete value only if properly placed and properly lighted. Hence the experimentalist attempts an interpretation—that is, he makes a hypothesis—which should be merely regarded as a question, calling for further inquiry. "Seek facts and classify them—and you will be the workmen of science. Conceive or accept theories—and you will be their politicians." For, as he points out, once a theory is accepted it is likely to become a dogma which must be defended rather than proved. He sharply contrasts the rigidity of the fact with the plasticity of its interpretation. The saying that "the exception proves the rule" is often repeated, forgetful of the fact that "proves" was here used in the old sense of "tests" or "probes." It is indeed the exception that tests the rule, and this Arthus clearly recognized. "A well-outlined subject, a question clearly put, an experiment able to lead to a unified solution, a categorical answer—these are some of the conditions required for a fruitful experimental investigation."

It is interesting to compare this with the method recommended by Francis Bacon in his famous *Novum Organum*, so long regarded as the introduction of modern scientific method. Historically this is not correct, for William Gilbert (the quatercentenary of whose birth has been recently commemorated) was beyond doubt the father of experimental science in England, and his *De Magnete* published in 1600 antedated all Bacon's theoretical contributions to the subject. Without belittling Bacon's influence, it is fair to say that we are now in a better position to assess the value of his contributions than were those who were dazzled by his great name and fame. He was right in believing that the collection of authenticated facts was the urgent need of his age, but wrong in believing that the results would emerge by passing all the facts through a logical mill. Prof. Major Greenwood recently went so far as to say that "Bacon was not a much more useful teacher or textbook writer than the despised ancients." This is severe indeed, but the most serious defect in Bacon's system was his claim that it went far to level man's wits and left little to individual excellence. This might appeal to some of our modern planners, but never was there a greater fallacy. It leaves out of account the scientific use of the imagination. Arthus, on the other hand, believes in this so long as it is carefully controlled by the test of further experiment. Bacon believed in induction as sufficient alone; Arthus recommends induction with a collection of facts and then deduction from the hypothesis thus reached, to be tested by a second process of induction before a generalization is reached.

<sup>1</sup> Maurice Arthus's *Philosophy of Scientific Investigation*. Preface to *De l'Anaphylaxie et de l'Immunité*, Paris, 1921. Translated from the French, with an introduction by Henry E. Sigerist. (Pp. 26; \$0.75.) Baltimore: Johns Hopkins Press.

The scientific investigator, in Arthus's view, requires more than intelligence: he needs character. His path is littered with obstacles, and he must have tenacity, with the capacity to distinguish this from the obstinacy that persists in exploring a blind alley. He must also be able to obtain stimulus from his teacher without surrendering his independence. The way of the investigator, as he sees it, is hard, but the rewards for following it faithfully are satisfying.

### BOVINE SERUM FOR TRANSFUSION

Reports from the battle fronts and from bombed cities have all emphasized the urgent need for early and often large transfusions for about 13% of casualties. For this purpose there has so far been no satisfactory substitute for human blood or its derivatives. It would clearly be an enormous advantage if animal proteins prepared from animal serum could be used, since they are available in almost unlimited supply, and with present events such abundant supplies would be most welcome. Both in this country and in the U.S.A. attempts have been made to employ ox serum for transfusion purposes. F. R. Edwards<sup>1</sup> has already reported in this *Journal* a preliminary clinical trial of a preparation of despeciated bovine serum. He found that treatment of bovine serum with sodium sulphate to remove the globulin fraction, which theoretically should contain most of the antibodies, resulted in a solution of albumin which gave severe reactions in two volunteers. He then tried to destroy the antibodies by heating, coagulation being prevented by addition of formaldehyde and ammonia. The final preparation contained approximately 5 grammes of protein per 100 c.cm., and was, he suggests, "a mixture of albumin and an agglomerated form of protein." The results of the administration of this fluid in amounts varying from 400 to 2,400 c.cm. to 26 patients with a variety of conditions are given in tabular form, and more detailed notes on two of the patients only are also available. Pyrexia and vomiting were recorded in three instances only. Considering that the majority of the patients were medical rather than traumatic cases, the lack of any reaction is most remarkable.

Much work on somewhat the same lines has been carried on in the U.S.A. Both whole ox serum and purified albumin prepared by Cohn's process have been used, with extremely conflicting results. Heyl, Gibson, and Janeway<sup>2</sup> have studied the effects of concentrated solutions of human and bovine serum albumin on blood volume after acute loss of blood in man. They describe no toxic effects other than the appearance of urticarial wheals from the ox concentrate, and claim that there was no significant difference in the effect on blood volume after the administration of ox or human albumin. The rise in plasma volume in all cases was much greater than the volume of the concentrated albumin solution injected, indicating, they conclude, that extra fluid had been added to the circulating plasma from the body's own reserves. Since extremely rapid over-dilution may occur immediately after haemorrhage in healthy individuals without the administration of albumin preparations (Dyson, Plaut, and Vaughan<sup>3</sup>), it is doubtful whether this interpretation of their results is correct. Dunphy and Gibson<sup>4</sup> have also reported experimental studies on dogs which suggest that bovine serum albumin may be as satisfactory as dog plasma in maintaining plasma volume and blood pressure in experimental shock. The

detailed and careful immunological studies published by Janeway<sup>5</sup> would, however, suggest that extreme caution should be exercised in the use of animal blood derivatives, however attractive they may be on theoretical grounds. It is clear that bovine serum will maintain blood pressure as well as human serum, and that it can be utilized by the human body, but it is equally clear that preparations now available may cause highly unpleasant and in some instances delayed reactions not unlike serum sickness. This is not surprising when it is remembered that, though bovine and human albumins prepared by the low-temperature alcohol-water method have almost identical chemical properties, they differ much when tested immunologically. Further, it is clear that cross-reactions occur between bovine albumin antisera and therapeutic horse sera used as antigens. This is of practical importance because so many horse antisera are employed to-day in the treatment of disease. Janeway, for instance, reports two subjects who had previously had horse serum, followed by severe sickness; they were given 8 and 12 grammes of bovine albumin respectively: one developed very severe serum sickness, and the other a strongly positive skin test for bovine alpha and beta globulin.

As Heyl and his colleagues themselves say: "No statement regarding the safety for intravenous use . . . can be made until more extensive clinical tests have been completed in order to determine to what extent and under what circumstances it will be safe to use a protein of animal origin in man." The use of such proteins is clearly not an immediate practical proposition. The millions of blood donors enrolled in the Emergency Medical Service still have an urgent job to do for the country.

### REHABILITATION OF INJURED MINERS

The development of rehabilitation for injured miners throughout the coalfields of Great Britain was the task accepted by the Miners' Welfare Commission in the autumn of 1942. Mr. R. Watson-Jones was appointed honorary director of rehabilitation, and he was assisted by a medical advisory committee. Rapid progress was made. Seven residential rehabilitation centres have already been opened in England, Scotland, and Wales; others are in preparation; six special hospital centres are available, and out-patient facilities are being developed. There is now provision for half a million miners, and within the next few months the requirements of over 90% of the industry will have been met. The special centres are provided with x-ray and plaster rooms, gymnasiums, treatment cubicles, recreation rooms, and playing fields. Surgeons are appointed jointly to the rehabilitation centre and to the associated fracture A hospital; they are assisted by physical training instructors, occupational therapists, and physiotherapists. Special members of the staff are responsible for problems of resettlement and retraining; management is governed by committees composed equally of miners and mine owners. The medical rehabilitation committee of the commission, responsible for central planning and administration, has been strengthened. Members appointed under the chairmanship of Mr. Watson-Jones include: Mr. H. A. T. Fairbank and Prof. H. Platt (Ministry of Health), Dr. Donald Hunter (industrial medicine research), Dr. S. W. Fisher (Ministry of Fuel and Power), Sir Robert Stanton Woods (physical medicine), Mr. Alexander Miller (vice-chairman of committee), Mr. I. S. Smillie (Gleneagles), Mr. F. W. Holdsworth (Sheffield), Mr. C. S. Walker (Stoke-on-Trent), and Mr. E. A. Nicoll

<sup>1</sup> *British Medical Journal*, 1944, 1, 73.

<sup>2</sup> *J. clin. Invest.*, 1943, 22, 763.

<sup>3</sup> *Quart. J. exp. Phys.*, 1944, 32, 255.

<sup>4</sup> *Surgery*, 1943, 14, 509.

<sup>5</sup> "Immunological and Clinical Studies on Purified Proteins of Human and Animal Plasma," Chap. XXI, in *Blood-Substitutes and Blood Transfusion*, by S. Mudd and W. Thalheimer, Charles C. Thomas, Springfield, Ill., 1942, p. 184.

(consulting surgeon to the committee). Mr. Trevor Evans is surgeon to the South Wales centre, Mr. J. B. Leather of Birmingham consulting surgeon to the Midlands centre, Mr. Gordon Irwin of Newcastle consulting surgeon to the Northumberland and Durham centre, and Mr. W. S. Diggle of Liverpool consulting surgeon to the Lancashire, Cheshire, and North Wales centre.

The physical hazards of mining are greater than in any other industry. One miner in every five sustains injury every year. This must be accepted by the miner as part of his contract, and he has the right to expect the highest possible standard in the treatment of his injuries. It is therefore with satisfaction that recent developments in the treatment of injured miners can be recorded—developments which will serve as an example to other industries in future years.

### PREFRONTAL LEUCOTOMY

Prefrontal leucotomy has now been practised for seven years in the U.S.A. and for over three years in this country. Enough experience has been gained for sober stock to be taken of its position, and Fleming's scholarly paper<sup>1</sup> is both welcome and timely. Watts and Freeman<sup>2</sup> have analysed the results of 136 personal cases: of 62 cases of involutional depression 37, at the time of writing, were employed and 11 others were at home; of 30 obsessive-tension states 21 were employed and 7 others at home; and of 31 schizophrenics 15 were employed and 11 others at home. Ziegler,<sup>3</sup> in a survey of 618 cases from 18 centres in the U.S.A. and Canada, finds that 214 recovered and 251 were known to be working part or full time. Comparable results have been found in this country. Bearing in mind that it is usual to employ leucotomy only in cases of bad prognosis and mainly after other forms of treatment have failed, these figures are encouraging. The operative mortality is not high: in Ziegler's 618 collected cases it was under 2%, in Watts and Freeman's series 2.2%, and McKissock<sup>4</sup> has had only 3 deaths in over 200 operations. Neurological sequels are few, the only common one being epileptic fits, which occur in some 10% of cases. Changes in personality may follow, but for the most part consist of a welcome release from emotional tension. This release may bring about a rather too care-free attitude to life. Freeman and Watts<sup>5</sup> observe that "some remain somewhat indolent, lacking in the imaginative capacity to see for themselves what needs doing. Others are freed from the restraints imposed by timidity, sensitiveness, or embarrassment, and they can carry on quite undistracted by their inner thoughts." There may be in some "a certain abruptness in manner and speech, a certain buoyancy, an enthusiasm, an ingenuous personality, even an exuberance, that is at times rather trying on the close associates." In judging the advisability of leucotomy these are the main dangers to be weighed against the degree of severity and intractability of the disease in each individual case. Kisker<sup>6</sup> deplors that the operation is condemned by some on the ground of vague "principles."

In addition to its therapeutic value, leucotomy has given an impetus to researches on brain function. Freeman and Watts see the main personality change resulting from leucotomy as a lack of ideation concerning the self and the future of the self. To them this loss of self-consciousness and of personal imaginative foresight seems to indicate that these attributes are especially highly integrated functions of the frontal areas. Cobb<sup>7</sup> criticizes these conclu-

sions. He does not believe that any special quality of behaviour is lost, but that the multiple association paths, normally traversed before civilized man's speech or action, are short-circuited by section of the fronto-thalamic fibres. He considers "long-circuiting" to be the essence of the problem. Using Fulton's term, "long-circuiting," to describe "the mechanism that allows spread of impulses from one reflex level up and down to other segments," he points out that it allows for an enormous increase in association, gives higher integration, leads to delayed action, and allows the past experience of an individual to affect his behaviour. In Cobb's view it would seem that the patient who has undergone leucotomy is relieved of his morbid type of cerebration, not by elimination of any specialized centre for foresight or other quality of thinking but by a general cutting out of association circuits. By this interpretation he explains quite logically Freeman and Watts's finding that the more white matter is cut the better the results.

### ANOMALIES OF LEFT COMMON ILIAC VEIN

Almost forty years ago McMurrich<sup>1,2</sup> described a series of obstructive anomalies of the mouth of the left common iliac vein. These observations have now received very complete confirmation in a recent paper by Ehrlich and Krumbhaar<sup>3</sup> which records the detailed examination of 399 cases. The left common iliac vein showed a definite obstructive anomaly in no less than 23.8% of the cases, and a further 4% were possibly slightly obstructed. These obstructions were in the nature of fibrous thickening and adhesions, and all occurred at the mouth of the left common iliac vein at its entry into the inferior vena cava. The obstructing lesions could be analysed into five groups: thickenings of the outer part of the vein wall; similar thickenings, with one or more secondary venous channels passing along the outer wall of the vein; antero-posterior or other bands crossing the mouth of the orifice; obstructions affecting the medial vein wall; and, finally, a miscellaneous group of lesions. Only exceptionally was there any narrowing of the vein lumen immediately below the obstruction. The histology of the lesions is not reported in any detail, but the authors state that the obstructed regions showed a great deal of elastic tissue, some collagenous tissue and smooth muscle cells, but no inflammatory cell infiltrations or irregular arrangement of scar tissue. An analysis of the age incidence suggested that few, if any, of the obstructing lesions were developmental in origin, but that almost all appeared during the growth period, and rarely after adolescence. An item of considerable interest is the fact that the obstructions were at the point where the right common iliac artery crosses the left common iliac vein. Ehrlich and Krumbhaar think that the anomalies they record have an important clinical significance in connexion with the greater frequency of deep venous thrombosis in the left lower limb than on the right side. On the other hand it is impossible to agree with them when they suggest that the venous anomaly has any bearings upon idiopathic varicosity, which does not show such striking difference in incidence between the two sides.

We much regret to announce the death of Prof. J. Shaw Dunn, M.D., who had held the chair of pathology in the University of Glasgow since 1936, in succession to Sir Robert Muir. Before returning to Glasgow in 1931 as Notman professor he had been professor of pathology in the University of Birmingham and in the Victoria University of Manchester. Our obituary notice will appear in a later issue.

<sup>1</sup> "Recent Progress in Psychiatry," *J. ment. Sci.*, Jan., 1944, p. 486.

<sup>2</sup> *Southern med. J.*, 1943, 36, 478.

<sup>3</sup> *Amer. J. Psychiat.*, 1943, 100, 178.

<sup>4</sup> Personal communication, May, 1944.

<sup>5</sup> *Amer. J. Psychiat.*, 1943, 99, 798.

<sup>6</sup> *Ibid.*, 1943, 100, 180.

<sup>7</sup> *Borderlands of Psychiatry*, 1943, Cambridge, Mass., Harvard Univ. Press.

<sup>1</sup> *British Medical Journal*, 1906, 2, 1699.

<sup>2</sup> *Anat. Rec.*, 1906-8, 1, 78.

<sup>3</sup> *Amer. Heart J.*, 1943, 26, 737.



## Reports of Societies

### THIOURACIL FOR THYROTOXICOSIS

A meeting of the Section of Experimental Medicine and Therapeutics of the Royal Society of Medicine was held on June 13, under the chairmanship of Dr. R. D. LAWRENCE, for a discussion on thiouracil in the treatment of thyrotoxicosis.

#### Clinical Experience in 32 Cases

Prof. H. P. HIMSWORTH reported on a clinical experience of this drug in 32 cases at University College Hospital. Of these, 26 were under his direct care and 22 had been observed beyond the stage of initial treatment. The longest period of observation had been 10 months, the shortest 10 weeks. Seven of the cases were started on thiourea, which alone was available at that time, but were turned on to thiouracil as soon as possible. The latter did not produce the vomiting, conjunctivitis, and smelling breath associated with thiourea, otherwise the drugs seemed to be alike. The dosage of thiourea was 1 gramme three times a day, and of thiouracil 0.2 gramme five times a day. The average duration of the initial course was 29 days. In no case did the treatment fail to effect conspicuous improvement, and none became drug-resistant. All patients gained weight, the basal metabolic rate and the pulse rate fell, and the plasma cholesterol went up. Sweating, skin flush, and nervousness disappeared, and diarrhoea, if present, stopped. In one of the two patients who had fibrillation, regularity was restored during treatment. The exophthalmos was not noticeably altered, and the goitre appeared in the majority of the cases to be unaffected; in two there was an increase in the size of the goitre during treatment, and the patient had to be operated on. The drug acted neither immediately nor uniformly upon the symptoms. There was little change in the pulse for a fortnight after treatment had started, but by the end of a month the pulse became normal. The first symptom to disappear was the skin flush, the last the quickened pulse. Three cases said to be resistant to thiouracil had been referred to him, but in each of them he found improvement, which indicated that the disease was coming under control, and the conception of resistance was evidently based on the fact that the pulse was still rapid.

From this it appeared that under thiouracil the symptoms and signs of thyrotoxicosis could be rapidly and effectively controlled, and the results of the initial treatment were at least comparable with those of surgery. Far smaller doses were needed for maintenance than for establishing control. One patient was put on a maintenance dose only one-fifteenth of that given at the beginning, and yet maintained increased weight, and there was no return of symptoms. The majority of patients were able to resume full work after a period of up to three months. It was too early to say whether treatment by thiouracil could be given up and the patient remain well, but two of the patients who had gone off thiouracil, for 7 and 10 weeks respectively, had maintained their improvement.

#### Untoward Effects of the Drug

If thiouracil had no untoward effects it would be reasonably certain that here was a cure for Graves's disease, but unfortunately it had an untoward effect, and only experience would show whether the drug was more dangerous than operation for removing the gland. Symptoms of overdosage must be distinguished from manifestations of idiosyncrasy. By the former he meant such symptoms as would be produced in any patient by giving too much of the drug. Such symptoms were divisible into two groups—gross overdosage manifesting itself by an increase in the size of the gland, and chronic overdosage in which the symptoms were more subjective. The patient might go on perfectly well on a small dose of thiouracil for months, and then come up with a condition superficially suggesting hypothyroidism, though there were no sure indications of that. This condition coincided with a sharp jump upwards of the blood cholesterol. To avoid these reactions the dose should be reduced to the minimum needed to maintain the weight.

Symptoms of idiosyncrasy appeared capriciously: fever, rashes, enlargement of lymph glands, swelling of legs and feet, and blood changes had all been reported. These appeared within a week or fortnight after starting the drug, and did not appear late in maintenance treatment. The most serious manifestations of idiosyncrasy were agranulocytosis, leucopenia, and thrombocytopenia. In the 32 cases mentioned there had been 2 of leucopenia and 1 fatal case of agranulocytosis. This patient had had 1 gramme of thiouracil a day for a month and proved completely resistant; she had previously been given iodine for two years on end. The dose was then pushed up to 2 grammes, and the thyrotoxicosis responded, but eight days after her discharge she developed a whitlow, and after that shivering and other signs; she was readmitted and given blood transfusion, but contracted bronchopneumonia and died. It was quite clear that there was some question of idiosyncrasy involved. The drug did not cause a steady depression of the white cells in all people. Of Prof. Himsworth's own 22 patients the white blood count on admission had ranged from 4,000 to 10,000, average 6,500, and the polymorphonuclears from 42 to 80%, average 59%. After one month's treatment the white blood count ranged from 3,000 to 11,000, average 6,800, and the polymorphonuclears from 40 to 81%, average 60%. When leucopenia appeared it appeared suddenly in patients whose previous blood counts had been normal. There was an indication that the development of agranulocytosis was influenced by the amount of drug given, not the total spread over many months, but the intensity of the daily dosage. They were now hoping to avoid trouble by giving small doses—0.5 gramme a day during the initial period and 0.1 or 0.05 as quickly as possible. The treatment was experimental, and patients should not be given this drug except under close, detailed, and continual investigation.

#### Nine Documented Cases

Mr. CECIL A. JOLL (whose paper was read for him in his absence) said that opinions at this stage could be scarcely more than tentative. Some of the more optimistic statements made in this country were, at any rate, ill judged. The name "thyrotoxicosis", embraced a number of diseases, of which Graves's disease was best understood, easiest to diagnose, and in some ways easiest to treat. The knowledge of thiouracil had been gained in connexion with Graves's disease, and little or nothing was known about its application in the larger and more insidious and hazardous group of cases included under the heading of secondary thyrotoxicosis. The number of cases of thiouracil treatment which his team had been able to observe was between 20 and 30, but many of these patients were not prepared to remain under direct observation for as long as was thought desirable, and he limited his paper to 9 cases which were fully documented. So far as the others were concerned, they did not show any appreciably better results. In 6 of these 9 cases the results were favourable and in 3 the reverse. Of the favourable cases 3 were mild, 2 severe, and 1 moderately severe. In one of the favourable cases the response was satisfactory, and the basal metabolic rate and the pulse rate came down; but the patient said she felt no better and asked for operation, which was performed. In the three unfavourable cases, after lack of satisfactory response to the drug, operation was carried out. Mr. Joll hoped that treatment with thiouracil would be allowed only under strict control, and that manufacturers would not release these powerful and dangerous drugs to all and sundry.

#### General Discussion

Dr. E. P. SHARPEY-SCHAFER said that at Hammersmith Hospital about 30 cases had been treated and had done extremely well. It seemed likely that these substances might be beneficial in other conditions—for example, in very severe chronic congestive heart failure. There was some evidence of the action of thiouracil on the normal thyroid. While at the end of a week or ten days there might be no histological changes in the normal thyroid after 2 grammes a day, such changes might occur if the administration was continued, and he showed a photomicrograph of a biopsy section of normal thyroid which had had this dosage, and drew attention to the absence of colloid and the considerable increase in height of the epithelium. He suggested that the Medical Research Council might be asked



# Correspondence

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to collate and prepare a statistical analysis of the evidence concerning the dangers of these drugs and issue some advice on the subject.

Dr. HORACE EVANS said that he had had an opportunity of observing 12 cases at the London Hospital; in all of them the results were demonstrably satisfactory, and no serious ill effect had been produced; in one there was slight leucopenia. Dr. G. MELTON spoke of the effect on auricular fibrillation, and related the case of a woman, aged 65, with severe thyrotoxicosis, whose rhythm was restored to normal after about a fortnight on thiouracil—a result confirmed by the electrocardiograph.

Dr. S. LEVY SIMPSON said that although Prof. Himsworth's opening statement had a tinge of optimism, and Mr. Joll's an accent of scepticism, the results described by both were very much alike. There was no doubt that in a large proportion of cases thiouracil did lower the pulse rate and the basal metabolic rate to normal or below normal, and the patients under treatment. Apparently the drug prevented the synthesis of thyroxine, in the size of the gland might be anticipated. He was convinced that thiouracil was a valuable and potent drug which, either in its present form or in some modified form, would find its place in therapeutics; but it was a potentially dangerous drug and at present should be used only by those who had specialized knowledge and were capable of observing their cases closely.

Prof. HIMS WORTH said that among the cases he had brought forward were a considerable number with secondary thyrotoxicosis, and he had no reason to suppose that they differed in their response to thiouracil from the improvement in decrease in the basal metabolic rate and the improvement in the clinical condition seemed to him exactly comparable in both sets of cases. If he might be allowed to criticize Mr. Joll's three "failures," it was not without significance that in every one of them iodine treatment had previously been given, and that two of them had been on thiouracil for three weeks and the third for four weeks, and then the administration had stopped; this in a patient who had been on iodine might be quite insufficient to show any effect on the pulse rate.

In an address on recent work on viruses at a meeting on June 2 of the Whipp's Cross Hospital Medical Society Prof. S. P. BEDSON described the psittacosis group, their relation to other viruses of similar morphology, and the interesting finding that some cases of atypical pneumonia were due to the virus of the psittacosis group, and that the natural hosts of this disease included in addition to birds of the parrot family, the fulmar petrel, the domestic fowl, pigeons, and possibly other bird species. He said that recent work had shown that herpes labialis in adults was the result of a carrier condition set up in infancy during an attack of herpes stomatitis. Thereafter host and virus lived in equilibrium and herpes only appeared when some intercurrent trouble upset the balance. Dismissing the mode of spread of poliomyelitis Prof. Bedson pointed out that the earlier and apparently convincing evidence incriminating the nasopharynx as the portal of entry was seriously questioned by recent American work, which demonstrated that the virus excreted in the stools, infection being probably spread by food contaminated by hands or possibly by flies; the absence of explosive epidemics suggested that infection was not water-borne. The lecture was illustrated by lantern slides, and aroused much interest. It was announced at the meeting that the Society intended to invite outside practitioners to join who would be circularized as soon as rules for membership had been agreed on. Meetings will not be held during July and August.

At a recent meeting of the Maternity and Child Welfare Group of the Society of Medical Officers of Health Dr. DOYNE BELL gave an address entitled "A Reassessment of some Paediatric Procedures," in which he discussed, among other subjects, the indications for circumcision and for tonsillectomy; tongue-tie; the physiological variation in the period required for the establishment of lactation; the technique of breast-feeding; the treatment of the breast-fed baby. He also dealt with the use of sedatives for the "crying baby," the treatment of bronchitis in infancy; the advantages of national dried milk over patent foods; and the low value of ultra-violet light as a source of vitamin D.

## Dictary Surveys

SIR.—The remarks by Miss E. M. Widdowson and Dr. R. A. McCance to the Nutrition Society, as reported in the *Journal* (June 10, p. 792), add point to a situation which may be described as follows.

If, ignoring the question of quality, there is, as is the case, complete ignorance of what constitutes an adequate amount of any one single nutrient substance; if the amount of these nutrient substances, as again is the case, varies in quantity in foodstuffs according to the locality of growth, manurial treatment, season, variety of plant, parts used, and other factors; if, as happens to be the case, the price of foodstuffs varies considerably from place to place and in the same place according to the social status of the purchaser; if, as is true, the point is not how much is *actually spent* on food but how much *could be spent* if it were not for the existence of ignorance and "luxury" spending, then it is difficult to see how anyone could say, as Orr and those who quote him do, that a certain proportion of the population is suffering from malnutrition because of lack of money wherewith to purchase an adequate diet.—I am, etc.,

J. P. MCGOWAN.

## Pulp Infection of the Fingers

SIR.—It is with the utmost satisfaction that I read the article on pulp infection of the fingers (June 10, p. 782), coming as it does from a member of the Forces. An inestimable amount of invalidism and permanent disability is caused by such infections, largely due to failure to appreciate the points enumerated by Major Denness. I would emphasize several additional facts in regard to treatment.

- (1) The ethyl chloride spray has no part whatsoever to play in the treatment of pulp infections. This, in my opinion, has in the past been the largest single factor in producing disasters. It now has a strong rival in the sulphonamide group of drugs.
- (2) Incision is most easily made and controlled while the finger is steady and rendered avascular by a strip of gauze held tight round the base of the finger.
- (3) The U-shaped incision taken round the tip of the finger close to the end of the nail is not mutilating; in fact the scar is often invisible so far proximally that the flap can easily be turned through a right-angle; if this is done no indwelling "drain" is necessary, and very infrequent interference with the wound is required.
- (4) Bandages should be dispensed with at the earliest opportunity, means of allowing free movement; even this should be left off for periods during the day while the patient practises active movements of the terminal interphalangeal joint with the middle phalanx held steady.

Only a primary subperiosteal infection or delay on the part of the patient in seeking advice can excuse bone necrosis. In every other case it is the practitioner or surgeon who is culpable and who should seek guidance in the hard school of self-criticism rather than in pondering whether he gave the proper dose of the proper sulphonamide!—I am, etc.,

D. J. ROSS STEEN, F.R.C.S.

Weymouth.

SIR.—The paper on treatment of pulp infection of the fingers in the field by Major T. Denness is of much interest, while it should be found of great value to all who have to deal with these important infections.

There are three points, however, that warrant further discussion.

- (1) Major Denness advocates the use of bilateral incisions of the pulp; I have used a unilateral incision, as described by C. L. Callander in his textbook on *Surgical Anatomy* (W. B. Saunders Company, 1939), for a large number of these infections with success. The knife is introduced into the lateral aspect of the pulp so that the tip of the knife can be felt just under the skin on the opposite side, and the incision is then made so that the whole of the pulp space is opened to allow adequate drainage; sinus forceps may be used to ensure that this is so. While on this point I would reiterate

Major Denness's remark that the incision need not be carried across the finger-tip, and I would add that it should never be, since it may result in loss of tactile sensation of the finger-tip, a notable prolongation in the time needed for healing, and often an ugly deformity of the finger.

(2) A corrugated rubber drain can still be used with the unilateral incision, although I have found that ribbon gauze soaked in a 50% solution of magnesium sulphate containing 10% glycerin is far superior, while it can be changed daily until pus is no longer present.

(3) Morphine seems to be quite out of place in the post-operative treatment, since, if the incision is adequate, the tension in the pulp space is relieved and the patient should be free from pain, and will sleep well with the help (if help be needed) of aspirin gr. x and barbitonum soluble B.P. gr. v on the first night, while he will sleep naturally on the following nights.

The need for prompt and thorough treatment is great, and, as Major Denness so rightly points out, "a man may be off duty longer with a whitlow than after appendicectomy"; that "conservative methods are unavailing" cannot be over-emphasized. In a recent letter (Feb. 5, p. 198) I showed that in pulp infections treated early the average healing time is 8.5 days, while delay can lead to a period as long as 26 days before healing takes place, and the resultant stiff finger is a cause of a further number of weeks' disability, which has its effect just as much in the factory as on the battlefield.—I am, etc.,

Surbiton Hospital

PHILIP HOPKINS.

### Volkmann's Ischaemic Contracture

SIR.—The article by Mr. G. A. Pollock (June 10, p. 783) is extremely opportune, as the question of ischaemia in general is worthy of the fullest consideration.

The statement from a textbook on orthopaedic surgery which is quoted by Mr. Pollock is one with which most will agree: but the question of early surgery must surely be for the ischaemia and not for the established deformity.

I was tempted to conclude from Mr. Pollock's article that he was not in agreement with the widely established view that ischaemic contracture is caused by arterial vasospasm. In a recent article on ischaemia I tried to collect the clinical and experimental evidence and show that vasospasm most commonly results from afferent impulses arising within the arteries themselves. Thus vasospasm may be limited to section of the artery above and below the site of origin of the afferent impulses, or it may involve the distal part of the artery completely. In the case of the radial and ulnar arteries one can be involved without the other. Thus, although the anastomosis between the radial and ulnar arteries is excellent, a vasospasm in either will seriously affect any structures which are supplied entirely or even almost entirely by that section of the artery in spasm. For example, I saw a man recently who was alleged to be the subject of Buerger's disease. He had already had a bilateral lumbar ganglionectomy; now the upper limbs were affected. One index finger was gangrenous at the tip and the condition seemed to be progressing. This was in spite of a good strong ulnar pulse, the radial being absent.

Wounds of large arteries by shell fragments, etc., are commonly associated with local vasospasm for which excision seems to be the best treatment. Thus it is, in spite of the seriousness of the injury, very little haemorrhage occurs. Unless these wounds are explored the vasospasm may be missed and in consequence gangrene or ischaemic contracture may result.

Adverting to the case described by Mr. Pollock, the history strongly suggests that the ulnar artery, as the result of trauma, became the site of a local vasospasm. No massive contracture could develop as the radial artery was intact. It would be interesting to know if there was an ulnar pulse at the time of examination, as the presence of a radial one does not affect the issue and, somewhat paradoxically, neither does the presence of an ulnar pulse, as the artery may be in spasm only to a limited extent. Even so the amplitude of the ulnar pulse might be much less than the radial.

The case history described by Mr. Pollock indicates a complete lack of infection. Thus a secondary haemorrhage on the twelfth day would seem unlikely unless the "secondary haemorrhage" were due to relaxation of a vasospasm. The

small disability caused in this case seems most likely to be due to the extremely limited area of muscle affected by the lack of ulnar blood supply. The somewhat late operation for a Volkmann (20 days after injury) was probably timely enough, in that gross changes resulting from ischaemia had not yet occurred or could not occur.

This letter is not intended in any way as a criticism of Mr. Pollock's article. It is merely a different approach to the matter in the interests of discussion. When one is faced with making the decision whether to explore a wound or not it requires considerable thought and may be luck to be right in every case. Most surgeons would have followed Mr. Pollock exactly up to Dec. 24; I doubt if most would have decided to explore at that time under the circumstances, though the end-result proved the wisdom of so doing.—I am, etc.,

Wembley.

J. SHIRLEY CALLCUTT.

### Cerebral Malaria

SIR.—I have read with interest the article by Dr. I. B. Sneddon in the *Journal* of Dec. 25, 1943, regarding the above, and also the letter on the same subject by Drs. G. B. Young and C. J. A. Macaden published on May 13 of this year. It seems to me unfortunate that so much emphasis is placed on the more severe types of cerebral infection—maniacal excitement, coma, etc. In my own experience as a neuropsychiatrist it was the milder types that were the more frequent and which occasioned the greater problem. For example, it was not uncommon to meet with a soldier who was accused of being drunk and disorderly suffering from cerebral malaria, or another absenting himself from his unit and found wandering. Further, many cases of sudden impulsive violence met with in the Far East I have demonstrated as being caused by a quartan cerebral infection. Neglect to recognize these cases is most unfortunate to all concerned.

With regard to the immediate treatment of severe cerebral malaria, I am of the opinion that local experience should always be consulted. In hospitals receiving patients from over a wide area it is wise to chart out the different schemes for reference, as the results obtained are vastly superior to any dogmatic plan. With this information available I have frequently given 10 gr. of quinine intravenously with excellent results. Where no experience was to hand 3 gr. of quinine well diluted and given very slowly should be tried, and, if no improvement takes place and no intolerance is noted, repeated in two hours.

In special practice one receives cases from many practitioners, and it may be that I have obtained an unfortunate concept of the incidence of quinine abscess as being by no means rare. When one recalls the amount of crippling and tissue destruction occasioned by a quinine abscess I am most reluctant to commend the intramuscular method to anybody.

In conclusion, I am of the opinion that it is wise to prescribe a course of psychotherapy in all cases of cerebral malaria, mild or severe. I believe, if this course was adopted, a large number of the dreadful tragedies which are not an uncommon sequel would be obviated.—I am, etc.,

Walkden, Lancashire.

D. FENTON-RUSSELL.

### Chemotherapy in Otitis Media

SIR.—It is most desirable that attention should be directed, as in Mr. Dingley's paper in your issue of June 3, to the dangers of sulphonamide therapy in acute otitis media, but I think he goes too far when he says, "The wholesale use of sulphonamides in otitic infections is to be deprecated." Mr. Dingley's antsulphonamide views are those of an otologist, but, after all, the real authority on the value of chemotherapy in early acute otitis is not the otologist but the general practitioner; he sees the cases which get better, the otologist as a rule only sees the ones which don't. Before sulphonamides were introduced my wife developed acute otitis, and I got a colleague to do a myringotomy; after their introduction my son was similarly afflicted, and I called in a good general practitioner as likely to know more about the behaviour of inflamed drums in the early stages under sulphapyridine.

My friends in general practice all say that the great majority of acute ears subside quickly and completely with sulphonamides. But, apart from evidence of frank mastoiditis, if

all the signs of simple acute otitis (whether the drum bursts or not) have not completely subsided in 10 to 14 days under adequate chemotherapy (and this for an adult means not less than 1 g. 4-hourly and not one tablet t.d.s., as one still sometimes finds given), an otologist ought to be called in at once. Under these circumstances the persistence of a profuse discharge alone is strong evidence that the mastoid is infected, and the persistence of any discharge at all a warning to be on the look-out for trouble.

My own experience of mastoid operations is that before the days of sulphonamides one encountered many more mastoids, but of these a very small percentage had complications; nowadays I do a fraction of the pre-war number of mastoids, but among them an enormously higher proportion come up with complications such as intracranial infection, sinus thrombosis, and septicaemia. The reason is as Mr. Dingley points out, that if the infection is not eradicated but merely suppressed it grumbles away silently in the mastoid till it gives rise to serious trouble. As regards myringotomy, I have almost packed away my myringotome: first, because I do not see the acute ears, since the general practitioners cure them; and, secondly, because I have been disappointed with the results of myringotomy in conjunction with sulphonamides—instead of the expected gush of pus I have often felt that I have only incised an oedematous drum and not really done any good.

Perhaps Mr. Dingley would say that if I got at the ears earlier and incised them without chemotherapy I wouldn't see so many complicated mastoids. I think the answer to that is that what is at fault is the non-realization of the damping-down effect of sulphonamides, particularly in insufficient dosage, and that to discourage general practitioners from using chemotherapy for acute otitis would do far more harm than good.—I am, etc.,

Guilford.

G. H. STEELE.

### Chemoprophylaxis of Gonorrhoea

SIR.—In your review of Dr. Herrold's book (June 3, p. 753) you state: "Apparently prophylaxis not only for Service men but for civilians is recommended; a warning is wisely uttered against the use of oral sulphonamides for this purpose." The last clause does not accurately represent Dr. Herrold's views. On page 91 of his book he says:

"This method of prophylaxis is not without danger because the incidence of patients previously sensitized to sulphonamides is likely to increase as time goes on. Such prophylaxis, therefore, is more safely given in close co-operation with a physician. Should oral chemotherapy prove efficacious, additional prophylaxis should be given for the prevention of syphilis. From a practical-view, therefore, the exposed individual should report for both measures of prevention and should not be given a quantity of the particular sulphonamide as a precautionary measure to be taken before or at the time of exposure."

Self-medication by sulphonamides is to be deprecated, but medical practitioners should not be dissuaded from prescribing, on the day following exposure, a method of prophylaxis of proved efficacy—e.g., three doses at four-hourly intervals of sulphathiazole or sulphadiazine, 3 g., 2 g., and 1 g. It should be added that in individuals whose work calls for a high degree of visual and mental efficiency such use of these drugs is inadvisable.—I am, etc.,

May and Baker, Ltd., Dagenham, Essex.

ROBERT FORGAN.

SIR.—I am interested to see your article (May 20, p. 695) on sulphonamide prophylaxis of gonorrhoea. The question of prophylaxis for this disabling disease is of prime importance, but I feel that one important observation has been omitted from the article which would prevent me from using it in the manner described, unless my views on the matter undergo a radical change in the light of the opinion of experts.

My objection is this: the administration of sulphathiazole prophylactically carries with it the danger that by its very administration we may hide those symptoms which are sometimes the only indication of the presence of the disease, a disease which a man is usually most anxious to hide, and which, in the absence of symptoms, he may not report at all. If sulphonamide is given prophylactically it is at the best a very "hit-and-miss" method, and cannot be subjected to critical analysis or results accurately assessed. I feel that if a man

has had prophylactic treatment it is very difficult to state whether he has (a) had the disease and been cured (a deduction which can only be made from the man's own statement), (b) has not been infected at all, (c) has got a latent form of infection without any external symptoms. In addition to this, it is surely axiomatic that wherever possible a patient should be allowed to develop his own immunity before calling in the aid of drugs.

I am not a venereologist and probably the factors I have mentioned can be satisfactorily answered by one with greater knowledge than myself, but at present I would be chary of introducing a form of preventive treatment over which I felt that I had little or no control, and the results of which I was unable to check with any degree of accuracy.—I am, etc.,

KENNETH G. BERGIN, M.B., B.CH.,  
Squad Ldr., R.A.F.

### Expectation of Life in Urinary Tuberculosis

SIR.—The case reported by Mr. Victor Bonney in your issue of May 20 illustrates the fact that Nature can effect what is to all intents and purposes a complete cure of tuberculous lesions of the urinary tract. Further examples are provided by two cases I saw some years ago.

1. X-ray examination of a lady aged 80 after an injury to her back revealed the fact that the right kidney and ureter were completely calcified. She informed me that she had had severe frequency, dysuria, and haematuria at the age of 20. These symptoms persisted for several years, then gradually disappeared. She has remained in good health since that time and has had no return of urinary symptoms.

2. A well-nourished and very active man of 60 who has attended St. Peter's Hospital for a number of years for dilatation of urethral stricture mentioned that he had been treated for urinary tuberculosis at the age of 15. His symptoms subsided after several years and he has remained in good health. Investigation showed that he had a completely functionless calcified left kidney. The left ureteric orifice was obliterated and retracted. The urine was normal.

In both these cases cure was effected by complete destruction of renal parenchyma with extensive fibrosis and calcification of the remaining peripheral renal tissue and fibrous obliteration of the ureter (so called "auto-nephrectomy"). It is obvious that a process such as this can only go on to completion when the lesion is a unilateral one, and it seems likely that in Mr. Victor Bonney's case destruction was confined to one kidney, tubercle bacilli being regurgitated from an infected bladder along the ureter of the normal side, and thus appearing in both ureteric catheter specimens. It should be pointed out, however, that spontaneous cure is the exception rather than the rule, and that there is overwhelming evidence to indicate that nephrectomy is the treatment of choice in any unilateral destructive tuberculous lesion of the kidney. In such cases surgery effects a complete and rapid removal of a progressive and (for all practical purposes) localized tuberculous focus. Nature's cure is, on the other hand, prolonged and may remain incomplete for a number of years; meanwhile the patient is exposed to the risks of spread of the infection, particularly in the direction of the opposite kidney.

The conclusion is that nephrectomy, in suitable cases of urinary tuberculosis, will on the whole increase the expectation of life, though it must be admitted that spontaneous cure will occur in a small proportion of cases not treated surgically.—I am, etc.,

JOHN SANDREY,  
Temp. Surg. Capt., R.N.V.R.

### Aerial Convection from Smallpox Hospitals

SIR.—Allow me to supplement my last letter by referring to the three letters appearing in the *Journal* of June 10.

As regards Sir Alexander Macgregor, we in Leicester also adopted the procedure he describes, and used 'not to allow members of the staff of the smallpox hospital (other than the medical officer) to go outside. After a certain spell of duty they were given long leave after thorough disinfection, and they were also paid extra salary. I am quite satisfied that "hospital operations"—apart from aerial convection—could not conceivably have accounted for the sudden and remarkable outbreak referred to in my previous letter.

As regards Dr. John Ware and his reference to the Purfleet experience, I certainly cannot agree with him that the bottom

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is knocked out of Sir George Buchanan's report because a solitary member of the staff at the hospital ships was discovered to have visited his sweetheart in Purfleet. In any case I only adduced the Purfleet experience as "strong confirmation" of the convection theory. I am glad to learn that Dr. C. J. McSweeney is one of those who have not lost faith in the theory.

Allow me to add a word of explanation to my original article. When I said that out of nineteen members who took part in the Epidemiological Society's debate seven were against the theory of aerial convection, I was including those (and they were the majority) who only said that they were not yet convinced and desired further confirmation. As Prof. Ralph Picken has shown in his letter, some confirmatory evidence has since been forthcoming, and I suggest that, but for the fact that there has been so little epidemic major smallpox in this country during the past 40 years, much more confirmatory evidence might have been forthcoming.—I am, etc.,

C. KILLICK MILLARD.

Leicester.

## Progesterone

SIR.—I would like to make a few observations on a letter from Dr. Walter Calvert (June 3, p. 772) on vomiting of pregnancy. In it he states: "I believe and teach that many of the physiological and minor pathological phenomena of pregnancy are due to the high blood level of progesterone." He then goes on to point out that progesterone relaxes plain muscle, and so produces uterine relaxation, constipation, low blood pressure, varices, and also vomiting. Acting on this assumption he has given stilboestrol in 1-mg. doses three times daily for three days with apparently good results.

In the past I have made various personal communications to Dr. Calvert, and am prompted to ask whether his views may not be based on the opinions therein expressed. If that is the case, I wish to make it quite plain that the originator of this theory, so far as I know, is Mr. Barton Gilbert, F.R.C.S., who is at present in Southern Rhodesia, and is thus unable to speak for himself. Before the war I had the good fortune to live with Mr. Gilbert for nearly a year, and during that time he propounded his theory in full so far as he had at that time worked it out. In short it was as follows: In some pregnancies the corpus luteum is more active than in others, and in some it may even be overactive. In the latter case there is an excessive amount of progesterone circulating in the blood stream, and it acts as a general relaxer of smooth muscle throughout the body. Let us consider the effects of this relaxation in further detail.

1. *The Blood Vessels.*—When the patient is in bed at night blood tends to "pool" in the dorsal region, and if the patient rises hurriedly in the morning, the column of blood at once falls to the lower extremities, producing a sudden cerebral anaemia. The patient at once tries to compensate for this by taking big breaths, in order to suck blood upwards through the action of the diaphragm. As the stomach sphincters are at the same time in a state of relaxation, and as the stomach is empty, this results in regurgitation of only a small amount of mucus into the oesophagus. Hence early morning sickness. In favour of this general relaxation of the blood vessels is the fact that slow rising in the morning is in many cases effective in combating early morning sickness. Another piece of confirmatory evidence is that transient "blackouts" are also common in pregnancy.

2. *The Intestinal Tract.*—This is generally relaxed in the early months particularly, with resulting constipation, piles, dyspepsia, and so on. I have personally had quite remarkable success in some cases of severe constipation of pregnancy by giving hexoestrol up to 10 mg. daily. I have never seen any ill effects, and have always kept a very careful watch on the blood pressure during its administration, as was suggested to me by Mr. Gilbert as long ago as 1938. As he then pointed out, the therapeutic effects of giving oestrin can be gauged by the rise in blood pressure that follows, and provided that the systolic pressure does not rise above 115 there will be no untoward effects.

3. *The Leg Veins.*—Relaxation in this situation naturally favours varices. The usual explanation is that there is "pressure" on the veins, yet in large abdominal swellings, such as fibroids and ovarian cysts, varices are not by any means the rule. Gilbert's view was that the circulating progesterone was the causative factor in the production of varices.

4. *The Veins of the Vulva.*—Similarly here too vulval varices were, he thought, due to the effects of progesterone.

5. *The Viscera in General.*—Here, as elsewhere, his theory postulates relaxation of the blood vessels supplying the part. The effect is particularly notable in the kidneys. During the early weeks when the corpus luteum is still active the kidney blood vessels may become progressively dilated, and thus stagnation of the circulation occurs. As a result the rate of blood flow becomes slower, and the effect is that the vessels, already dilated, become more and more full of blood. Finally thrombosis or haemorrhage will occur. This is of course, very roughly, the pathology of the kidney changes in eclampsia. According to Gilbert's theory, the haem. in toxæmias of pregnancy is done in the early months by the continued relaxation of the kidney vessels, and thus when the disease becomes obvious in the later weeks, by the appearance of albumin in the urine and a rise in blood pressure, it is virtually untreatable except by symptomatic measures. Logically the blood pressure could be lowered by giving more progesterone, but as this is already in excess the condition would merely be aggravated by such treatment. Again, oestrogens could be given to negate the effect of the circulating progesterone, but as oestrogens raise the blood pressure this too is illogical. The rise of blood pressure was in his view merely an indication that an attempt was being made to compensate for the kidney insufficiency, as shown by the presence of albuminuria. He felt that if only some simple means could be elaborated of estimating in the out-patient department the level of the circulating progesterone in the early months, it might be possible to treat toxæmias logically instead of empirically from the outset of the disease. Unfortunately the advent of the war cut short any further investigations along these lines.

6. *The Uterus.*—Relaxation of the uterus, with primary uterine atony, was in his view due to the same cause, and this he felt was borne out by the fact that toxæmic patients are on the whole more prone to this condition.

7. *The Placental Site.*—Continued dilatation of the vessels of the placental site favours retroplacental bleeding and the occurrence of accidental haemorrhage.

8. *The Urinary Tract.*—Relaxation of the smooth muscle in this situation favours urinary stasis, ascending infections, and thus the occurrence of pyelitis of pregnancy.

With reference once again to Dr. Calvert's letter, I too have had very good results with hexoestrol in early morning sickness and also in constipation of pregnancy, but I cannot say that the results have been uniformly good. I have on the whole given larger doses—up to 10 mg. daily—with no ill effects. Another condition that I have found will sometimes respond well is depression and loss of energy in the early months, but only if this is associated with a very low blood pressure, with systolic readings of 80 to 90.

In conclusion I would stress once again that so far as I know the whole of the theory outlined above was worked out by Gilbert as early as 1938.—I am, etc.,

London, W.1.

## Fractured Carpal Scaphoid

SIR.—I was much interested in the article on fracture of the carpal scaphoid by Jeffrey M. Robertson and R. D. Wilkins in the *Journal* of May 20. Having sustained fracture of the right scaphoid myself in 1940, there are many points in their article which apply to my own case and which I feel will not be out of place if they are reiterated.

I agree whole-heartedly with Robertson and Wilkins in stressing the importance of having all sprains x-rayed. In my own case I did not at first believe that I was suffering from anything more than a sprain of the wrist. The accident I had resulted from cranking up my car, which back-fired. I suffered some pain in the wrist which was not severe enough to prevent me from driving to the hospital that morning, and carrying out an operation list. My wrist felt very tired at the end of the morning's work, and I decided that an x-ray would be advisable. To my surprise, a small crack was visible in the scaphoid (Fig. 1b). This crack was not in the usual situation for a fracture to occur—that is, in the waist of the bone. This x-ray plate further brings out points as remarked in the article of Robertson and Wilkins—namely, the importance of taking exposure in different planes. It will be seen that in Fig. 1 no fracture is seen in position 1a and 1c, but shows up distinctly in position 1b.

Again, the authors remark on the extreme difficulty in demonstrating a fracture, in many cases, in the early stages. This is shown in my own case, as seen in Fig. 2. This was taken 20 days after the original x-ray, and it will be seen that a line of rarefaction is now beginning in the waist of the

scaphoid. Between the taking of the first radiograph on Aug. 20, 1940 (Fig. 1), and the one on Sept. 10, 1940 (Fig. 2), a radiograph was taken, but this showed no fracture in the waist, although the fissure was still present in the distal part of the bone.

I am of the opinion that in many cases of "sprained wrists" a great deal of later disability can be avoided if the precaution is taken of applying a plaster-of-Paris immobilization even in

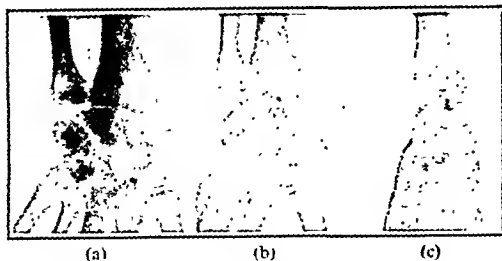


FIG. 1

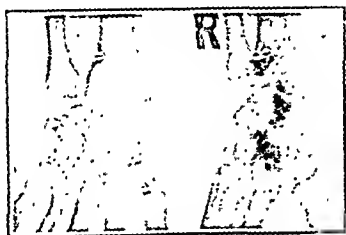


FIG. 2

those cases where x-ray examination is negative. In such cases, furthermore, it is important that radiographs be taken so as not to miss a delayed fracture which has developed owing to osteoporosis as in my own wrist.

I am much indebted to my former colleague, Mr. J. Hindenach, F.R.C.S., who treated my wrist in such an excellent manner, and to Dr. W. H. Caldwell for his radiological skill.—I am, etc.,

Slough Emergency Hospital

MALRICE LEE.

London, W.1

F. M. R. WALSH.

### Why Tie the Cord?

SIR,—I read with much interest Dr. E. W. Price's letter (June 3, p. 772), for much other evidence supports the view that ligation of the cord is normally unnecessary. This evidence has been reviewed in a book on the foetal circulation, etc., written by Dr. A. E. Barclay, Miss M. M. L. Prichard, and myself, and shortly to be published by Messrs. Blackwell Scientific Publications Ltd., Oxford. The most striking single contribution is that of A. N. Rachmanow (*Zbl. Gynäk.*, 1914, 38, 590), who was convinced by the structure of the cord vessels in man and lower animals that ligation was unnecessary, and thereafter proceeded to demonstrate the fact in several thousand confinements in a State maternity hospital in Moscow. My co-authors and I are not obstetricians, but the general trend of the evidence is such that we felt bound to conclude with the sentence: "One's only surprise is that a procedure, so firmly based upon the physiological properties of the cord vessels, has not been more universally adopted."—I am, etc.,

Oxford.

K. J. FRANKLIN.

### Medical Education

SIR,—I surmise that it is as the representative of "the practical man" that Dr. W. E. Hick (June 10, p. 796) has felt impelled to reply to my letter, and I do not dispute that there is an aspect of truth in his letter. Unfortunately, it does not contain the whole truth about the problems of medical education. It is that familiar fragment of the truth that we are never allowed to forget and that has done so much in the past to make medical education what we now deplore it to be. In the hope of making every new doctor the complete craftsman, we have overloaded the student with techniques and with masses of uncoordinated information. We have made him look on—under conditions rendering useful observation almost

impossible—at complicated surgical operations that, as a general practitioner, he will never be called upon to perform. We have inflicted no fewer than six lectures on smallpox vaccination upon him, and a vast deal of other wholly unpractical "practical" tasks. All this at the behest of generations of "practical men." We have made the cultivation of a reflective mind virtually impossible for him, and now seek to palliate our folly by maintaining that, after all, reflective minds are rare and most men prefer to occupy themselves with techniques.

Let us agree that the practising doctor should, in his proper field, be a competent craftsman, but must we confine him to this role? The pure craftsman does not add to knowledge; he simply practises and transmits what he has been taught. Is this all we ask of the doctor and of a medical education? Hitherto we have prided ourselves as forming a learned profession. Do we wish so to continue, or are we in future to be content—with Dr. Hick—to accept the motor mechanic as our exemplar and ideal? If, as I believe is the case, we do wish to remain a learned profession, then we must accept the intellectual responsibilities and privileges involved, and bear the burden of some learning over and above our bedside and laboratory techniques. We have no right to ask for a university degree on a purely polytechnic type of knowledge, and, like undergraduates in other university faculties, we must be prepared to examine the foundations of our science and to acquaint ourselves with its general principles. The university student of physics, even if he intends ultimately to be an electrical engineer, is expected to know the foundations of physics. This knowledge does not render him less efficient as an engineer, and will probably prove the basis of any additions to knowledge he may himself make.

Are we to suppose that medicine differs in these respects from other scientific disciplines, that the medical student is less willing than his fellows to think about his subject or that he is incompetent to do so? That he has not time for thought is an objection it is now sought to remove from his path, and if we can release the stranglehold of the "practical man" from his education and systematize his training there will be no difficulty in doing so. There are few students who would not be the better for at least a leaven of theoretical education, even if this did involve some small contact with metaphysics, of which I have not the superstitious dread shared by your correspondents.—I am, etc.,

### Character and Personality in the Medical Student

SIR,—I am instructed by the Committee of the St. Mary's Hospital Students' Union to write with reference to certain allegations made against the modern medical student in your columns (May 27, p. 729). Dr. E. D. Broster asks: "How can it be wondered at if the medical schools are crowded with men with brains but no character, with precepts but no principles? Decent living, refinement of speech and of conduct, love of poetry or the arts of good conversation, of wisdom, of learning—all these have been at a discount and have even been scoffed at in the physical and mental squalor of the years between the wars." In the majority of the great medical schools to-day there exist thriving societies for the advancement and study of these very arts and refinements. To name but a few: there are the medical societies, where many and varied subjects are lectured on and discussed; dramatic societies, where good plays are read and acted and dramatic art and literature considered in many of its aspects; musical societies, where great musicians of our time come to play and discuss good music. Furthermore—and this is important—in most schools these societies have arisen as an expression of a spontaneous desire of the students themselves.

How can it be said, then, that a love of these arts and of the good conversation that is part of them does not exist? And who would deny that character and principles and decent living are born or kept alive by the British love of sport, so well seen in the medical schools to-day? In the future these activities may well be extended and widened in their scope and receive a greater measure of official encouragement, in order that the students' general education may profit thereby; but to deny that these things exist at the present is surely idle.—I am, etc.,

DONALD BROWN,

Hon. Sec., St. Mary's Hospital Students' Union, W.2.



## Obituary

### JUDSON S. BURY, M.D., F.R.C.P.

Dr. Judson Bury, consulting physician to the Manchester Royal Infirmary, died at Chinley, Derbyshire, on June 10, aged 92. He had long retired from active practice, but was president of the Section of Neurology and Psychological Medicine at the Annual Meeting of the B.M.A. in Manchester in 1929.

Judson Sykes Bury was born at Salford the son of Peter Bury. He was educated at Amersham Hall, Reading, at Owens College, Manchester, and at University College Hospital, London. In 1877 he took the M.R.C.S. and the M.B., B.S. of London University, proceeding M.D. two years later, after holding resident posts at U.C.H. He then returned to Manchester, where, after a year as senior resident medical officer at the Children's Hospital, Pendlebury, he engaged in general practice and began his long connexion with the Royal Infirmary as non-resident medical registrar in 1885. He became assistant honorary physician in 1899, and remained on the active staff of the Royal Infirmary till 1912, when he reached the age limit. He was a very good teacher, clear and precise, but best on neurological subjects, and he wrote with an excellently lucid pen. He was well read in general literature, and introduced such knowledge with interesting effect into his professional papers. In 1893 he published a *Treatise on Peripheral Neuritis*, comprising a series of observations by James Ross, which Ross had intended to print as a complete monograph. On Ross's death at the age of 55 it was left to Bury to carry out the intention as fully as he could. The first half of the book was written from views expressed by word of mouth to him by Ross; but the rest was his own except the section on diabetic neuritis written by R. T. Williamson. Judson Bury also published in 1894 *Clinical Medicine*, a manual for the use of students and junior practitioners; it met with a good response and a third edition appeared in 1912, written jointly with Albert Ramsbottom, his junior colleague at the Manchester Royal Infirmary. In his *Diseases of the Nervous System* (1912) Bury adopted a clinical classification which he had found the most useful to the student. His method was to give a description of the chief neuronic systems, and then illustrate the various forms of paralysis and other nervous symptoms in relation to lesions of the corresponding neurons. He also wrote an article on peripheral neuritis in 1899 for *Allbutt's System of Medicine*. An interesting section of that article is the reference to the epidemic of neuritis caused by arsenical impurity in the beer supplied in the Manchester and Salford districts by a firm of brewers, the cause of which was discovered by E. S. Reynolds.

Judson Bury was elected a Fellow of the Royal College of Physicians of London in 1894 and delivered the Bradshaw Lecture before it in 1901, his subject being "Diagnosis in Relation to Disorders of the Nervous System." He examined in medicine for the College in 1911-15. He took his full share of honours in local scientific work, being president in turn of the Pathological Society and the Medical Society of Manchester, and of the Association of Physicians when it met in that city. He was professor of clinical medicine in Manchester University in 1911-12, and he edited the *Manchester Medical Chronicle* from those years until the disturbances caused by the last war ended his career. During 1914-18 he served with the rank of major, R.A.M.C., and did good work on medical boards in Manchester and Warrington.

Four years ago his friends and colleagues presented him with a book containing selected addresses and papers by him printed in Manchester between 1896 and 1939. Judson Bury bore his octogenarian years very well, never looking his age, his hair and beard scarcely silvering. He was a golfer and had been president of the local medical golf society.

### GEORGE WAUGH SCOTT, O.B.E., M.D.

George Waugh Scott was taken ill at the cottage of one of his country patients on June 6; he died a few hours later at his home in Malvern Links at the age of 61. After qualifying at Glasgow University in 1907 and serving as senior house-surgeon at Greenock Infirmary he became medical officer to

the Kamuning, Heawood, Changhat Salak, and Other Estates Hospitals Association, spending the bulk of his professional life in medical practice in Malaya, where his interests were particularly related to tropical medicine and epidemiology.

Since he came to Malvern in 1937 (writes a colleague) he has never rested on his oars; the outbreak of war saw him anxious to help his country, and he offered his services for the East again or wherever they might be required. He was asked to get the Malvern first-aid post going in 1939, and one of the most efficient posts with a happy staff resulted in record time. He made but one stipulation—that he should not be paid for this work; all his staff were unpaid volunteers and he must be treated similarly. In the brief but strenuous years he had resided in Worcestershire the character of the man "always to give of his best" was soon recognized by his patients, so that he gained their confidence and affection in a remarkable way. He was deservedly popular with all practitioners because he was always willing to help in any way and was a delightful companion. At the time of his death he was chairman-elect of the Worcester and Bromsgrove Division of the B.M.A., and in previous years had served on the council and as president of the Malaya Branch. He was a Fellow of the Royal Society of Tropical Medicine and the first president of the Vigornian Clinical Society. He showed that it was possible for one busy in general practice to keep abreast of the times, and to participate actively in hospital clinical meetings. These he seldom missed, nor did he fail to promote in them a lively discussion and an atmosphere of friendliness. He carried his Scottish individuality with him and radiated charm. More than one person had been heard to say that his companionship would go far to mitigate the disadvantage of life in the Far East. He is survived by his wife and his son Gavin, who continues in the practice.

T. S. M. writes: Waugh Scott will be mourned by many friends in this country, and by others in the Changi Concentration Camp at Singapore. He was truly a pioneer, and worked in Malaya from 1908 to 1936. His first tour of service was spent on a "jungle-locked" tin mine, in medical charge of some thousands of Asiatics, with only river and sea communications to Singapore. Later he settled in Perak, and became the medical officer for many rubber estates, certain public works, besides engaging in private practice. He was a sound general practitioner, and also an expert in the prevention of malaria and other tropical conditions. Many a poor Asiatic blesses his name, the wealthy companies appreciated his services and advice, and the Government acknowledged his welfare and public work by granting him the O.B.E. During a busy medical career he engaged in many aspects of public life, was a good churchman, president of the local B.M.A. and a member of most central medical and welfare bodies. In public he was a clear, thoughtful, and fearless speaker not always to his own advantage.

## The Services

Surg. Cmdr. G. M. Tanner and Surg. Lieut.-Cmdr. H. E. Holling, R.N.V.R., have been awarded the R.N.V.R. Officers' Decoration.

Col. (Temp. Brig.) E. A. Sutton, C.B.E., M.C., late R.A.M.C., to be a D.M.S., with the acting rank of Major-Gen.

Wing Cmdr. C. A. Rumball, R.A.F., was appointed O.B.E. (Military Division) in the Birthday Honours List published on June 8. This name was omitted from the list of medical honours published in the *Journal* of June 17 (p. 823).

Acting Wing Cmdr. C. C. Barker, R.A.F., has been awarded the A.F.C.

Fl. Lieut. G. D. Graham, M.B.E., R.A.F.V.R., has been awarded the D.S.O. in recognition of distinguished services in air operations.

### CASUALTIES IN THE MEDICAL SERVICES

*Wounded*.—War Subs. Capt. C. Cronin and A. D. Parsons, M.C., R.A.M.C.

*Killed*.—Major T. P. Ward, R.A.M.C.

*Died*.—Major V. H. Sarland, R.A.M.C.; War Subs. Capt. C. W. Williams, R.A.M.C.

### DEATHS IN THE SERVICES

Col. EDWIN THOMAS FAIRWEATHER BIRRELL, C.B., C.M.G., died on May 29 at Penicuik, Midlothian, at the age of 80. He was educated at Trinity College, Glenalmond, and Edinburgh University, where he graduated with the M.B. in 1895. He entered the Army Medical Service in the following year and reached the rank of colonel in 1917. During the Balkan war of 1912-13 he served as British Red Cross Society Commissioner for Bulgaria and received several foreign orders. During the war of 1914-18 he served at the headquarters of the British Expeditionary Force, and later with the British Salonika Force and with the British Military Mission to South Russia. He received the C.M.G. in 1915 and the C.B. in 1917. He retired in 1923 and was recently serving in the Home Guard.

## Universities and Colleges

### UNIVERSITY OF SHEFFIELD

On the recommendation of Senate the Council of the University has elected Mr. R. St. Leger Brockman, M.Chir., F.R.C.S., to the chair of surgery. Prof. Brockman served from 1914 to 1919 as a surgeon in the Royal Navy, after an undergraduate course of distinction at Cambridge and St. Bartholomew's Hospital. After the war he first went to Sheffield as a resident surgical officer at the Royal Infirmary; then followed a period in London as chief assistant at Bart's; after which he returned to Sheffield, where he has been an honorary surgeon at the Royal Infirmary, consultant to the City General Hospital, and lecturer at the University.

### ROYAL COLLEGE OF PHYSICIANS OF IRELAND

At a meeting of the President and Fellows of the Royal College of Physicians of Ireland held on June 2 the following were admitted:

As Fellows: Agnes Savill (*in absentia*), S. Simms, C. F. McConn, R. C. Sutton (*in absentia*), T. D. O'C. Donelan, E. B. McEntee, J. G. Gallagher, and W. J. E. Jessop.  
As Members: M. J. O'Malley and M. D. Hickey.

### ROYAL COLLEGE OF SURGEONS IN IRELAND

#### BOXWELL MEMORIAL

The teaching staff of the Schools of Surgery, Royal College of Surgeons in Ireland, has decided to institute a memorial to the late Prof. William Boxwell, who occupied the chair of pathology from 1916 to 1943. All Fellows and Licentiates of the College, and all other medical or non-medical persons who wish to associate themselves with this effort, are asked to subscribe to the memorial fund which is being formed. The fund will be devoted to providing some additions to the Department of Pathology which will further the study of that subject, and it is hoped that the appeal will meet with a generous response. Subscriptions should be sent to Prof. W. N. Rae, Sc.D., Registrar, Royal College of Surgeons in Ireland, Stephen's Green, Dublin.

## Medical Notes in Parliament

### Opium for Straits Settlements

During the debate on colonial administration on June 6 Mr. W. W. ASTOR expressed regret at the announcement of the Colonial Office that they would not allow opium in any form to return to the Straits Settlements. This decision would have the opposite effect to that desired by the Colonial Secretary, because it was quite certain that drug addiction would be far worse since the Japanese had been there. If opium were cut off entirely, with these large numbers of addicts there would be a tremendous black market, and smuggling and law evasion, bringing in drugs in much more dangerous forms, such as cocaine and heroin. This would lead to a worse drug problem, which would have to be tackled again.

### Vitamin D for Europe

On June 6 Viscount SUTDALE asked the Parliamentary Secretary to the Ministry of Economic Warfare in what quantities vitamin D was now being imported into German-occupied countries. Mr. G. H. HALL, who replied, said that the Government agreed to the dispatch of ten kilogrammes of vitamin D in December, 1943, and again in March this year. These twenty kilogrammes were for distribution to children in Belgium, France, Holland, Yugoslavia, and Poland. In addition we agreed, in October, 1943, to let one kilogramme go to Belgium, and last April a quarter of a kilogramme was sent for distribution in the Channel Islands. Before a concession was made in regard to vitamin D, none was imported with our consent into any part of enemy-occupied Europe except Greece, where all the demands of the Neutral Commission had been met.

### Voluntary Hospitals in an N.H.S.

Mr. WILLINK told Dr. Russell Thomas on June 8 that he could not then say how frequently routine and special inspections of voluntary hospitals participating in a national health scheme would take place. Details of the arrangements for inspections were matters to be considered at a later stage. Mr. Willink further informed Dr. Thomas that he had not estimated what average proportion the Exchequer grant and the payments of joint local authorities towards the cost of maintenance and treatment of patients would be to the total

cost of maintenance and treatment of patients in voluntary hospitals participating in a national health scheme. In the White Paper it was contemplated that, in the hospitals' interests, the aggregate of the central and local payments would be such as still to leave an opportunity for voluntary support. How this could best be arranged remained for discussion with the hospitals' representatives. The British Hospitals Association seemed to think that an opportunity for voluntary support was desirable.

## Medical News

Next year will be the bicentenary of the foundation of the world-famous Lying-in Hospital, Dublin, more usually known as the Rotunda Hospital. It has been decided that, on account of war conditions, it would be impossible to commemorate this date in a fitting manner in 1945, and it is proposed to hold in July, 1947, under the auspices of the Rotunda Hospital, a Congress of Obstetrics and Gynaecology in Dublin, which it is hoped that world conditions by then will allow to be of an international nature.

Prof. F. A. E. Crew of the University of Edinburgh will give a lecture under the auspices of the Polish Medical Association in the United Kingdom on "New Problems of Social Medicine," on Tuesday, June 27, at 5 p.m., at B.M.A. House, Tavistock Square, W.C. Visitors will be welcome. The lecture will be followed by a discussion.

The fourteenth annual general meeting of the Paddington Medical Society will be held on Tuesday, June 27, at 9 p.m. in the Board Room of St. Mary's Hospital, W. The title of Dr. Z. Green's presidential address is "Medicine in the Post-War Era."

A meeting of the Nutrition Panel of the Society of Chemical Industry will be held at 2.30 in the rooms of the Chemical Society, Burlington House, W., on Tuesday, June 27, when a series of four papers will be presented on "The Taste and Quality of Food in Relation to Nutrition" by Prof. H. Hartridge, Dr. G. W. Scott Blair, Dr. D. R. Davis, and Mr. R. R. Plowman.

The annual general meeting of the Fever Hospital Medical Service Group of the Society of Medical Officers of Health will be held at Tavistock House, Tavistock Square, London, W.C.1, on Friday, June 30, at 3 p.m. The subject for discussion will be penicillin, and the principal speakers will be Sir A. Fleming ("The Penicillin Content of Blood following Administration by Various Routes") and Dr. A. Dolphin ("Penicillin in the Treatment of Septicæmia and Meningitis").

The Lord Mayor paid an official visit on June 5 to the London Chest Hospital, Victoria Park, E., and before touring the wards inspected plans for rebuilding the hospital, which suffered severe damage during an air raid. The plans provide for a modern building with greatly increased accommodation.

The Oxford Ophthalmological Congress, which was to have been held in July, has been postponed. It is hoped it may be possible to arrange a meeting later in the year.

The meeting of the School Medical Service Group of the Society of Medical Officers of Health to have been held on July 21 has been postponed until further notice. The President of the Board of Education has promised to offer a date for his address to the Group as soon as circumstances permit.

Mr. F. G. Wells, of Hanwell, has been elected president of the Pharmaceutical Society of Great Britain. Mr. Wells is vice-chairman of the Middlesex Pharmaceutical Committee.

## EPIDEMIOLOGICAL NOTES

### Discussion of Table

In *England and Wales* the only infectious disease that increased markedly in incidence was measles, with 96 more notifications than last week. Notifications of the other infectious diseases decreased by the following amounts: scarlet fever 374, whooping-cough 154, dysentery 87, diphtheria 36.

Diphtheria notifications fell to the lowest weekly total yet recorded. This disease is relatively more prevalent in the north than in the south, and 41% of the total cases were notified in the counties of Yorks West Riding, Lancashire, Durham, and Northumberland, where 70, 69, 34, and 30 cases respectively were recorded. The decline in scarlet fever was general, and the number of notifications was the smallest for over one year. In Lancashire, Warwickshire, and Yorks West Riding whooping-cough notifications fell by 65, 40, and 37 respectively. In London the incidence of whooping-cough rose by 42. The largest increases in measles were in London 54 and Lancashire 47, while the largest fall was in Durham 30.

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## EPIDEMIOLOGY SECTION

Dysentery notifications numbered 178, this total being, with one exception, the lowest for seventeen weeks. The highest returns were Lancashire 33, London 24, Warwickshire 18, Glamorganshire 17, Derbyshire 13, Essex 13.

In Scotland there were 85 more cases of measles than last week, 78 of acute primary pneumonia, and 60 of whooping-cough. The rise in the incidence of pneumonia was general throughout the country, but measles and whooping-cough were prevalent mainly in Glasgow, where the cases were 68 and 35 respectively more than last week. Glasgow had 24 cases of dysentery, Lanark County 23, and Edinburgh 14; the total for the country rose by 7.

In Eire the notifications of measles dropped from 260 to 105. For the third week a case of typhus was notified in Roscommon, Castlereagh R.D.

In Northern Ireland there was a slight rise in the notifications of measles and scarlet fever. 40 of the 42 cases of measles and 29 of the 60 cases of scarlet fever were reported from Belfast C.B.

## Tuberculosis

The mortality from respiratory tuberculosis has fallen during the past two years after rising during the first war years. The female deaths in England and Wales were fewer in 1942 and 1943 than in the immediate pre-war years, but the male deaths were at a slightly higher level in 1942 than in 1938-9. In Scotland both sexes had a higher mortality in 1942-3 than in the pre-war years. Deaths from non-pulmonary tuberculosis in England and Wales have fallen to pre-war level, but they remain above the pre-war total in the notifications of tuberculosis since the outbreak of war. The data for 1938-43 are:

## England and Wales

Year	Deaths						Total
	Pulmonary			Non-pulmonary			
	Male	Female	Total	Male	Female		
1938	12,445	8,837	21,282	2,261	1,996	4,257	
1939	12,702	8,840	21,542	2,229	1,852	4,081	
1940	13,920	9,740	23,660	2,381	2,103	4,484	
1941	13,985	9,648	23,633	2,653	2,384	5,037	
1942	12,511	8,478	20,989	2,426	2,134	4,560	
1943	13,064	8,276	21,340	2,218	2,092	4,310	
Notifications							
1938	21,302	16,577	37,879	6,511	6,299	12,810	
1939	19,695	15,235	34,930	5,660	5,616	11,276	
1940	20,988	15,163	36,151	5,272	5,149	10,421	
1941	23,147	16,352	39,499	5,819	5,646	11,465	
1942	23,623	17,006	40,629	5,937	6,053	11,990	
1943	—	—	42,458	—	—	11,934	

Scotland

## Scotland

Year	Deaths			Non-pulmonary		
	Pulmonary		Total	Male	Female	Total
	Male	Female				
1938	1,396	1,185	2,581	435	416	851
1939	1,506	1,211	2,717	411	398	809
1940	1,669	1,368	3,037	486	480	966
1941	1,646	1,471	3,117	516	542	1,057
1942	1,561	1,482	3,043	473	482	955
1943	1,581	1,395	2,976	473	510	983
Notifications						
1938	2,603	2,190	4,793	1,369	1,403	2,772
1939	2,432	2,225	4,657	1,202	1,238	2,440
1940	2,720	2,492	5,212	1,240	1,270	2,510
1941	3,002	2,737	5,739	1,255	1,300	2,555
1942	3,272	2,952	6,224	1,342	1,482	2,824
1943	3,730	3,485	7,215	1,408	1,465	2,873

NOTES

Figures for 1943 are provisional only. Comparison of 1943 with those available.

## NOTES

Table for England and Wales.—The figures for 1943 are provisional only; separate figures for males and females are not yet available. Comparison of the deaths from pulmonary tuberculosis by age groups in 1943 with those in 1939 shows that increases occurred among children under 15 and among men at each age group over 35, whereas decreases occurred among women of each age group.

Table for Scotland.—Age groups specially affected by recent increases in pulmonary tuberculosis are: under 5 (M. and F.); 10 to 15 (F.); 15 to 25 (M. and F.); and 25 to 35 (M. and F.). There are no age groups specially affected by increases in non-pulmonary tuberculosis.

## Week Ending June 10

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,428, whooping-cough 2,473, diphtheria 470, measles 3,078, acute pneumonia 738, cerebrospinal fever 66, dysentery 181, paratyphoid 3, typhoid 1.

## INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended June 7.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included), (b) Scotland, (c) Eire, (d) Northern Ireland (administrative county), (e) The 16 principal towns in Scotland, (f) The 13 principal towns in Eire, (g) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notified no return available.

Disease	1944					1943 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	71	3	32	—	3	79	7	31	5	6
Deaths ..	—	2	1	—	—	—	2	—	—	—
Diphtheria ..	471	21	124	53	21	630	37	160	66	31
Deaths ..	10	1	2	6	1	9	3	7	—	—
Dysentery ..	187	24	95	—	—	125	8	35	—	—
Deaths ..	—	—	—	—	—	6	—	—	—	—
Encephalitis lethargica, acute ..	2	—	1	—	—	—	—	—	—	—
Deaths ..	—	—	—	49	10	—	—	—	47	9
Erysipelas ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	1	—	—	—	—	—	—	—
Infective enteritis or diarrhoea under 2 years ..	45	5	13	10	5	51	13	4	33	6
Deaths ..	—	—	—	—	—	—	—	—	—	—
Measles ..	2,758	271	514	105	42	7,668	365	517	23	44
Deaths ..	1	1	1	—	—	1	—	—	—	—
Ophthalmia neonatorum ..	82	4	22	—	—	107	10	30	1	1
Deaths ..	—	—	—	—	—	6	—	—	—	—
Paratyphoid fever ..	—	—	—	2(B)	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Pneumonia, influenza* ..	794	61	7	4	5	768	42	5	2	15
Deaths (from influenza) ..	14	2	—	—	—	6	—	—	—	—
Pneumonia, primary ..	—	—	34	24	5	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Polio-encephalitis, acute ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Polio-mycelitis, acute ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Puerperal fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Puerperal pyrexia† ..	195	8	12	2	2	169	16	26	2	2
Deaths ..	—	—	—	—	—	—	—	—	—	—
Relapsing fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Scarlet fever ..	1,479	92	206	23	60	1,921	168	220	54	54
Deaths ..	1	—	—	—	—	—	—	—	—	—
Smallpox ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Typhoid fever ..	6	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Typhus fever ..	—	—	—	—	—	—	—	—	—	—
Deaths ..	—	—	—	—	—	—	—	—	—	—
Whooping-cough ..	2,273	283	210	27	15	2,144	151	226	17	46
Deaths ..	23	6	2	—	—	11	—	—	—	—
Deaths (0-1 year) ..	345	45	61	27	24	310	48	67	38	23
Infant mortality rate (per 1,000 live births) ..	4,190	617	590	195	127	3,949	556	573	199	127
Deaths (excluding stillbirths) ..	—	—	—	—	—	—	—	—	—	—
Annual death rate (per 1,000 persons living) ..	6,754	832	956	486	309	6,501	762	1,041	431	321
Live births ..	—	—	—	—	—	—	—	—	—	—
Annual rate per 1,000 persons living ..	231	26	36	—	—	228	22	23	—	—
Stillbirths ..	—	—	—	—	—	—	—	—	—	—
Rate per 1,000 total births (including stillborn) ..	—	—	—	—	—	—	—	—	—	—

\* Includes primary form for England and Wales, and Eire, county, and Northern Ireland.

† Includes puerperal fever for England and Wales and Eire.

‡ Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

## Letters, Notes, and Answers

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### ANY QUESTIONS?

#### Aetiology of Bronchiectasis

**Q.**—In reply to a query on the subject of bronchiectasis (Dec. 11, p. 771) it was stated that it was questionable whether inflammatory changes could be considered the primary cause of the condition. Could you inform me what alternative views are held regarding its aetiology? In my student days some 40 years ago bronchiectasis, a morbid condition obtrusively recognizable without recourse to radiography, was almost a rarity, but soon afterwards suddenly became common throughout the world.

**A.**—Your correspondent appears to have read into this answer rather more than is justified. I think that the distinction which was drawn was between pathological states rather than causes. There is, however, much controversy about the basic cause of bronchiectasis. There are two main theories: (1) that the infection of the bronchi is the primary cause and that collapse or consolidation of the lung is an adjunct or secondary effect; and (2) that collapse of part or the whole of a lobe produces a condition of dilatation which is made permanent and symptom-producing by subsequent infection. The evidence is discussed very fully in *Bronchiectasis* by Lisa and Rosenblatt (Oxford Medical Press, 1943), which is in the B.M.A. library. The very great apparent increase in the incidence of the disease is due to the fact that before the introduction of bronchography with lipiodol only very advanced cases could be diagnosed.

#### Some Facts about Dysentery

**Q.**—It was stated in your leader entitled "An Increase in Diarrhoeal Disease" (Jan. 29, 1944, p. 155) that there had been a big increase in the notifications of dysentery, and I see that the notification figure in the weekly epidemiological table shows no tendency to fall. Presumably in summer months it may even show a tendency to rise. Would it be possible to answer briefly the six questions I send?

**A.**—1. What is the usual mode of spread? Infectivity is high and the organism may be spread in a variety of ways: (a) from case to case, as when an infected person, after using the lavatory, soils the seat or the handle of the flushing cistern; or, without washing his hands, proceeds to contaminate food, cutlery, drinking vessels, etc.; (b) as an explosive outbreak when an infected food-handler contaminates milk or milk products or other prepared foods; (c) contamination of food by flies.

2. Is there an animal reservoir of infection? No: except that infected flies may carry the organism for 24 hours.

3. How is infection maintained in the community? (a) By the missed mild case. (b) By the convalescent carrier, whom modern cultural methods have shown to be very common and who may continue to excrete the organism for weeks after he is clinically well. (c) By the healthy contact carrier, of whom there is always a fair proportion in any outbreak.

4. What are the symptoms and duration of the mild form likely to be missed? Both Flexner and Sonne infections occur in mild atypical form without blood or mucus in the stools; the symptoms may be diarrhoea or relaxed stools for one day only.

5. What is the treatment—dietetic, drug, isolation? (a) Light restricted diet—e.g., predigested milk foods—until the diarrhoea ceases. (b) The safest drug is sulphaguanidine, 4–6 g. daily for a child, and 9–12 for an adult, given 4-hourly during the day. Begin treatment as early as possible and reduce to half doses after 4 days; continue for 3 more days. Good results are also obtained with sulphydrydine or sulphathiazole. Adequate fluids must be given. (c) Isolation at home or in hospital is essential where there are other, particularly younger, children in the household.

6. If the disease is generally mild, is the use of sulphonamides justifiable? In mild infections sulphonamide therapy is required to obtain bacteriological cure as early as possible and so minimize the risk of spread. Sulphaguanidine will do this in Flexner infections;

sulphydrydine or sulphathiazole is more effective in Sonne infections. The earlier treatment is begun, the better the chance of bacteriological cure. Intimate family contacts may be protected by small daily doses (2–3 g.) of sulphaguanidine.

#### Still More about Threadworms

**Q.**—Some textbooks state that *Enterobius vermicularis* does not multiply in the intestine, and that it is necessary for the eggs containing embryos to be swallowed to produce a fresh crop of adult worms. If this is true and reinfection is prevented, it is difficult to understand why a spontaneous cure should not occur, whereas it is stated in an answer to a question in the *Journal* of March 25 last (p. 445) that "treatment is proverbially unsatisfactory."

**A.**—The difficulty is to prevent reinfection. The gravid females crawl out of the anus at night and lay their eggs in the peri-anal region, the larva within the egg becoming infective within 12 hours. The migration of the females causes an intense itching, which invariably leads to scratching of the infected region, often during sleep; as a result the fingers become contaminated with the eggs, which are afterwards carried to the mouth and swallowed.

#### Operation for Acute Appendicitis

**Q.**—Why do some surgeons nowadays appear to make a practice of never operating upon cases of acute appendicitis? From a pathological point of view it seems all wrong. There must be a large number of people who have had an attack who still have their infected appendix inside them. Is it a passing phase to "sit on" acute cases, or have we returned to pre-Edwardian days? The surgeons who do this would probably not "sit on" an acute mastoid.

**A.**—Many cases of acute appendicitis will resolve if the intestine is put completely at rest. Some, however, will develop complications; and, since nobody can tell in the early stages of the disease to which group the case may belong, very few surgeons make a practice of never operating upon acute appendicitis.

From the pathological point of view it is interesting to note that resolution, even after abscess formation, means a return to a state so closely approximating to the normal that within a few weeks (on the average about six weeks) the caecum and appendix appear healthy at laparotomy. Furthermore, there is little resemblance between this condition and mastoiditis, for in any bone infection there is a risk of spreading phlebitis, which is fortunately such an uncommon event in appendicitis.

The conservative treatment of carefully selected cases of acute appendicitis cannot be regarded as a passing phase; and to suggest that it may be a return to the age when appendicitis was little understood shows a lack of appreciation of the modern conception of the response of the body to acute infection.

#### Anaesthesia for Torn Perineum

**Q.**—We have been told a good deal lately of the danger of using spinal anaesthesia in labour. Does the danger still exist if a low spinal anaesthetic is given for sewing up a torn perineum?

**A.**—General anaesthesia is unnecessary for the repair of small perineal tears. Local anaesthesia in the form of 1% procaine is simple, safe, and effective. For extensive tears involving the anal sphincter a general anaesthetic is usually required. In view of the circulatory adjustments that follow the completion of the third stage of labour, anaesthesia (such as spinal) that lowers the blood pressure should be avoided; furthermore the risk of meningitis after lumbar puncture has always to be considered.

#### Risk of Embolism in Labour

**Q.**—A woman of 41 is expecting her first child at the end of July. She is very stout; her blood pressure varies from 110/80 to 130/80. She has marked varicose veins on both legs. She has had headaches of a migraine type (severe and frequent attacks) before and at the beginning of her pregnancy, but not so many recently. Her own mother died from embolism after confinement. (1) Would heparin be indicated to prevent embolism after her confinement, or would its administration endanger her by interfering with the necessary clotting at the site of the placenta, as it extends the coagulation time? (2) What would the dosage and mode of administration be, and when would treatment have to begin? Is there any other prophylactic treatment for such a case?

**A.**—This patient would not appear to be an ideal obstetrical type. Her blood pressure, however, is reassuring. The present position in regard to the use of heparin in this type of case is not sufficiently clear to permit its use to be freely advocated. There are dangers, and if the treatment were to be given it should be done in a well-equipped institution with adequate pathological facilities, where daily progress could be supervised by specialists. An older but better line of treatment would be to concentrate during the ante-natal period on raising the haemoglobin to its maximum level; for anaemia would, of course, be a predisposing factor in bringing about subse-

quent thrombosis and embolism. Once the child is delivered the mother must be encouraged to move about actively in bed, and even if an episiotomy is performed or a tear is sustained she should be encouraged to move her legs and thus maintain adequate circulation. The use of an efficient masseuse to supervise active movement and massage would be a great help. A factor in this case which should not be overlooked in a primigravida of 41 is the natural anxiety she must have in view of the nature of her mother's death. Encouragement throughout her ante-natal period will do a great deal to lessen her fears and, as a result, the chance of inertia occurring. This is the more necessary as any prolongation of her labour or excessive interference will be likelier to precipitate a subsequent thrombosis.

#### Grenz Rays

Q.—Some time ago, in reply to a question on leucoderma, it was stated that Grenz rays sometimes proved beneficial. I have made inquiries among colleagues (including radiologists), but have been unable to obtain any information about them, or about anyone with the necessary apparatus and skill.

A.—Very low voltage (or infra-Roentgen) rays were first studied by Schultz in 1911 in the treatment of some skin diseases. Their use was developed and popularized by Bucky (Grenz Ray Therapy, trans. 1929). Grenz rays are nearer x rays than ultra-violet; their wavelength is about 2 Angström (glass of a low density) to allow passage has a lithium glass window (absorbed in the epidermis, so of the rays. Almost all the rays are absorbed in the epidermis, so local applications may be useful in superficial dermatoses, especially when any deeper effect is to be avoided, as in the scrotum or eyelids. Bucky and others have also reported, by general trunk irradiation, distant effects on many diseases in which an endocrine or autonomic nervous system factor may be involved, as in asthma, arthritis, angioneurotic oedema, urticaria, and allergic dermatitis. These observations require confirmation. Many of the complaints listed have sometimes responded also to other forms of irradiation, as ultra-violet and small doses of x rays to the trunk, in continued series of sessions, with frequent blood counts as a check. Bucky's results, if confirmed, support the theory that the skin acts in part as an endocrine gland, and they increase the already wide, but largely unexplored, field of indirect radiotherapy, which has its greatest scope of accepted usefulness in the results of heliotherapy or ultra-violet light therapy (general) in tuberculosis, when associated with other hygienic measures. Bucky's papers in the *Medical Record* (1935, 142, 71, 109, and 165) summarize the general effects of Grenz rays in alopecia, vitiligo, and other conditions, as well as those above mentioned.

#### B.C.G. Vaccine

Q.—What is B.C.G. vaccine? Is it obtainable at the present time commercially? Is it likely to be of use for immunizing a native population in the Tropics which is being attacked by tuberculosis? You tell me where detailed information for its use can be found?

A.—A suspension of living tubercle bacilli of the strain known Calmette-Guérin bacillus, which by prolonged artificial cultivation in unfavourable media has been rendered almost completely avirulent and incapable of causing progressive disease even in the highly susceptible guinea-pig. It has been administered by the mouth to infants, mainly in France, and by subcutaneous injection to both children and adults. There is sound experimental evidence that it will increase the resistance of guinea-pigs and calves to infection with virulent tubercle bacilli, and some clinical evidence of protection in human beings, notably among nurses in Scandinavia. The question is referred to the *Journal* of Dec. 4, 1943, which contains a report of a discussion on this subject at a meeting of the Tuberculosis Association, and editorial comments thereon. The numerous original papers of French, Scandinavian, and American authors should be consulted for details. The immunization of a susceptible native population exposed to infection is decidedly a proper field for employing B.C.G. vaccine. It is not obtainable commercially in England, and should in any case preferably be prepared in the country in which it is to be used, since, like all preparations of living micro-organisms, it has a short effective life.

#### Sterilization of Syringes

Q.—What is the best solution to use for sterilizing hypodermic syringes and needles and keeping them sterile in spirit-proof cases? The ideal solution for practical purposes would (1) sterilize in about 5 minutes (2) maintain sterility for several days or weeks without spoiling or corroding. Would a 2% solution of dettol in methylated spirit fulfil these objects?

A.—We know of no evidence that any feasible chemical method can be relied on for disinfecting a contaminated syringe. Any syringe which has been used for a septic purpose should always be sterilized by heat. On the other hand, a syringe kept only for aseptic purposes, such as the injection of sterile medicaments through normal skin, should not require repeated disinfection by an infallible method in the ordinary circumstances of careful use. If safety is

to be combined with reasonable convenience, a distinction must be made between different types of use, sterilization by heat being always regarded as the only perfectly reliable method, and imperatively called for when contamination is known or suspected, or when the risk, even if remote, is great, as in mass inoculation.

#### Mode of Action of Aspirin

Q.—Would you give me a summary of the mode of action of aspirin?

A.—The full chemical explanation of the action of aspirin is still unknown, but the following facts have been established. Aspirin lowers the temperature in fever by acting on the centres in the hypothalamus which regulate heat loss. The temperature fall because of increased heat loss, due to sweating and to dilatation of the skin vessels. These changes do not occur if the temperature is normal. Aspirin causes a small fall of the metabolic rate, but does not lower the temperature of normal persons unless toxic doses are used. Aspirin also has a mild analgesic effect due to an action on the brain, and, like other derivatives of salicylic acid, it reduces the swelling of the joints, in rheumatic fever. Very large doses cause restlessness, delirium, and convulsions, followed by coma and death, but absorption is slow and lives can be saved by washing out the stomach. A few persons have an idiosyncrasy for aspirin, so that comparatively small doses cause an allergic response in the form of asthma, vasodilatation, or urticaria.

## LETTERS, NOTES, ETC.

### The Tavistock Clinic

The Tavistock Clinic (Institute of Medical Psychology), at present housed at Hampstead, reports a year of as great activity as a depleted staff will permit. Only in one previous year in the Clinic's history was the number of those applying for advice and treatment as great as in 1943. In the adult department the types of complaint which have brought the patients to seek advice have shown no marked changes, but whatever the specific condition, depression is usually present to some extent. This is thought to be the result of the cumulative effect of fatigue, frustration, and exhaustion. While it is only for a minority that wartime conditions amount to a real burden affecting health, the margin for many of the remainder is narrowing, and any additional strain may be felt to be intolerable. The number of adult attendances in 1943 was 6,410, and of child attendances 3,807, and as each interview lasts normally an hour, the strain on the small staff can be imagined. Intelligence tests have been carried out on the children who for various reasons have been referred to the Clinic. Half of them have been found to be of average ability, compared with approximately 75% in a normal sample of the population; 30% of the children were found to be above the average. This confirms the belief that psychological problems arise to a greater extent in those of unusually good or unusually poor ability, with, in the Tavistock Clinic experience, the balance weighted slightly towards the higher level.

### Vomiting of Pregnancy

Dr. W. I. HARDY (Vibthwaite, Nr. Ulverston) writes: I have read with interest the letters of Drs. Calvert and Edwards regarding the aetiology and treatment of vomiting of pregnancy. Dr. Calvert (June 3, p. 772) supports the theory that the digestive disturbances of pregnancy may be due to the high blood level of progesterone. I have noted that injections of progesterone—given to assist or prevent abortion—may apparently initiate nausea and vomiting in patients who had not yet developed this symptom. This may, of course, be a coincidence, as they were given during the first three months. Nausea and vomiting if previously present have become more severe for a short period following the progesterone injections. Certainly injections of oestrin appear to benefit one-third to one-half of cases of indigestion in pregnancy. Unfortunately for the endocrine theory of causation of symptoms, these do not always respond to endocrine therapy.

### Fasciculating Muscles

As one reader has misunderstood a sentence in the answer to a question under the above heading in the *Journal* of June 10 (p. 801), other readers may have erred similarly. The sentence read as follows: "Although it is rare, the condition is well recognized by neurologists, to whom it is usually referred as amyotrophic lateral sclerosis." To make the matter explicit for the hurried reader, the second half of the sentence should perhaps have read, "... to whom it is usually referred with the wrong diagnosis of amyotrophic lateral sclerosis."

The shilling pamphlet entitled *A Reading List for Relief Workers* noticed on June 10 (p. 785) is not published by the Oxford University Press but by the Royal Institute of International Affairs, Chatham House, 10, St. James's Square, London, S.W.1.



